Annual Report 2020

NOVARTIS

Samsung v. Regeneron, IPR2023-00442
U.S. Pat. 10,130,681, Exhibit 2230

Annual Report 2020

Chairman's letter

The COVID-19 pandemic in 2020 created massive societal, economic and healthcare challenges. Novartis took careful steps to protect our associates, maintain supplies of medicines to patients and ensure business continuity, helping us also meet the needs and interests of our healthcare partners, stakeholders and shareholders.

These actions enabled Novartis to navigate the pandemic and paved the way for future growth. We increased sales and operating profit in 2020, generated good cash flows and continued to innovate. We absorbed the economic shock without resorting to government support or dividend cuts, and we committed to no COVID-19-related job losses during the year. Our performance demonstrates our strong operational resilience and ability to cater to diverse patient needs in challenging situations.

Even as the healthcare landscape changed, we launched new products and strengthened our foothold in the biosimilars arena. Our new launches included the multiple sclerosis medicine *Kesimpta* and the lung cancer treatment *Tabrecta*. We supported these market entries through digital platforms. Biosimilars, meanwhile, benefited from increased demand amid a continued focus on healthcare costs.

Our research and development activities remained robust. We leveraged remote monitoring technology to ensure patient safety while keeping the majority of our clinical trials on track. We also enhanced internal and external collaboration to bolster our medical pipeline. Going forward, we will continue to pursue our science-based innovation strategy, focusing on fast-growing areas of healthcare, including oncology, cardiology and lung diseases.

We also participated in cross-industry collaborations to fight the pandemic and took steps to support patients in low-income and lower-middle-income countries through a dedicated generic medicines portfolio as well as the creation of a relief fund for affected communities. These efforts are designed to help mitigate the effects of the pandemic in the months and years to come, especially in the most vulnerable regions of the world, where healthcare-related challenges can have undue long-term societal and economic consequences.

Demonstrating the Board of Directors' and management's attention to the growing importance of our environmental, social and governance (ESG) agenda, we further reduced our environmental footprint, expanded our

global health efforts and strengthened our governance framework. We consider these steps essential to contribute to efforts led by the United Nations to fight poverty and climate change, and work toward the creation of more equitable societies.

With the goal of strengthening our reputation and protecting the interests of patients, stakeholders and shareholders, we also overhauled our third-party risk management to establish stricter controls of our supplier network. Our new Code of Ethics, crowdsourced by associates and rolled out in 2020, is aimed at integrating ethics more closely into business decision-making. These steps are helping Novartis make progress toward its ambition to be one of the world's most trusted healthcare partners.

I thank you for the confidence you have placed in our company and am pleased to be able to propose a dividend increase of 2% to CHF 3.00 at the next Annual General Meeting.

Sincerely,

Joerg Reinhardt
Chairman of the Board of Directors

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CEO's letter

2020 was a unique year in the long history of Novartis, as the COVID-19 pandemic challenged us to deliver on our purpose despite immense challenges to healthcare systems and society. Our company has the utmost respect and gratitude for healthcare professionals around the world who are caring for patients, as well as for scientists who are finding ways to end the pandemic.

As we review our performance for the year, I feel proud of the resilience and agility of our people who continued to make progress in reimagining medicine. In challenging circumstances, they maintained the supply of Novartis medicines to patients around the world while advancing our pipeline and pivoting to new ways of engaging with customers and each other.

We continued to make progress on our strategic priorities. We delivered new innovative medicines for patients, including a treatment for relapsing forms of multiple sclerosis and a first-in-class siRNA cholesterol-lowering treatment. We continued to develop and build out our pipeline, which remains one of the most valuable in the industry. We're especially optimistic about our mid- to late-stage pipeline, tracking five promising assets in our Oncology pipeline, six in our Pharmaceuticals pipeline, and an additional five medicines that are already approved and that we believe can be further applied to expanded areas of treatment.

Our ongoing commitments to operational excellence and our digital transformation were critical to our success. We managed disruptions to our development programs, with our early investments in data science and technology helping to keep the majority of our clinical trials on track. As most of the world went into lockdown, we mitigated the disruption as much as we could by shifting to digital launches. We kept our supply stable while continuing to transform our production network to prepare for future growth.

We also continued to make progress in building trust with society. We announced new, ambitious targets regarding access to medicine and global health, and we issued a sustainability-linked bond to reinforce our commitment to achieving them. We also strengthened our environmental targets, launched a new Code of Ethics, and followed through on our promise to settle legacy legal matters from years prior.

Culture underpinned all of our efforts. The pandemic connected associates even more strongly to our purpose, created new demands for learning, and demonstrated the benefits of empowered working. We launched a new working model in 2020 designed to provide associates with greater flexibility while ensuring we continue to drive innovation and performance.

I'm also proud of the ways Novartis contributed to the global pandemic response. Through Sandoz, Novartis was the first company to commit to keeping the prices of essential generic medicines stable. We launched a first-of-its-kind not-for-profit portfolio of medicines to treat symptoms of COVID-19. And we played our part in the scientific effort to find treatments for the disease. Across the industry, we are sharing our scientific findings and our research and manufacturing capacity while committing to equitable distribution of diagnostics, therapeutics and vaccines. Many more response efforts are outlined in this report.

Delivering on our strategy supported our financial performance in 2020. Although the pandemic affected demand in some therapeutic areas, strength in key products helped us post net sales of USD 48.7 billion, up 3%, measured in constant currencies (cc). Our core operating income rose 13% (cc) to USD 15.4 billion.

As I write this letter at the end of 2020, the world remains in the grip of COVID-19. Yet we have reasons to be optimistic. The pandemic has demonstrated what is possible when human resilience and collaborative science rise to the occasion. Novartis will continue to deliver on our purpose to reimagine medicine by developing transformative new treatments and finding innovative solutions to the world's most pressing healthcare challenges.

Sincerely,

Vas Narasimhan
Chief Executive Officer

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Introduction and use of certain terms

Novartis AG and its consolidated affiliates publish consolidated financial statements expressed in US dollars. Our consolidated financial statements responsive to Item 18 of this Annual Report on Form 20-F (Annual Report) are prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB). "Item 5. Operating and Financial Review and Prospects," together with the sections on products in development and key development projects of our businesses (see "Item 4. Information on the Company—Item 4.B. Business overview"), constitute the Operating and Financial Review ("Lagebericht"), as defined by the Swiss Code of Obligations.

Unless the context requires otherwise, the words "we," "our," "us," "Novartis," "Group," "Company," and similar words or phrases in this Annual Report refer to Novartis AG and its consolidated affiliates. However, each Group company is legally separate from all other Group companies and manages its business independently through its respective board of directors or similar supervisory body or other top local management body, if applicable. Each executive identified in this Annual Report reports directly to other executives of the Group company that employs the executive, or to that Group company's board of directors.

In this Annual Report, references to "US dollars," "USD" or "$" are to the lawful currency of the United States of America, references to "CHF" are to Swiss francs, and references to "euro" or "EUR" are to the lawful currency of 27 member states participating in the European Union; references to the "United States" or to "US" are to the United States of America, references to the "European Union" or to "EU" are to the European Union and its 27 member states, references to "Latin America" are to Central and South America, including the Caribbean, and references to "Australasia" are to Australia, New Zealand, Melanesia, Micronesia and Polynesia, unless the context otherwise requires; references to the "EC" are to the European Commission; references to "associates" are to employees of our affiliates; references to the "SEC" are to the US Securities and Exchange Commission; references to the "FDA" are to the US Food and Drug Administration; references to the "EMA" are to the European Medicines Agency, an agency of the EU, and references to the "CHMP" are to the Committee for Medicinal Products for Human Use of the EMA; references to "ADR" or "ADRs" are to Novartis American Depositary Receipts, and references to "ADS" or "ADSs" are to Novartis American Depositary Shares; references to the "NYSE" are to the New York Stock Exchange, and references to "SIX" are to the SIX Swiss Exchange; references to "ECN" are to the Executive Committee of Novartis; references to "GSK" are to GlaxoSmithKline plc, references to "AAA" are to Advanced Accelerator Applications S.A., references to "Novartis Gene Therapies" are to Novartis Gene Therapies, Inc. (formerly AveXis), and references to "Endocyte" are to Endocyte, Inc.

All product names appearing in italics are trademarks owned by or licensed to Group companies. Product names identified by a "®" or a "™" are trademarks that are not owned by or licensed to Group companies and are the property of their respective owners.

Forward-looking statements

This Annual Report contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the United States Private Securities Litigation Reform Act of 1995, as amended. Other written materials filed with or furnished to the SEC by Novartis, as well as other written and oral statements made to the public, may also contain forward-looking statements. Forward-looking statements can be identified by words such as "potential," "expected," "will," "planned," "pipeline," "outlook," "may," "could," "would," "anticipate," "seek," or similar terms, or by express or implied discussions regarding potential new products, potential new indications for existing products, or regarding potential future revenues from any such products; or regarding the potential outcome, or financial or other impact on Novartis, of the acquisition of The Medicines Company, and other transactions described; or regarding the potential impact of share buybacks; or regarding potential future sales or earnings of the Group or any of its divisions or potential shareholder returns; or regarding potential future credit ratings of the Group; or by discussions of strategy, plans, expectations or intentions. Such forward-looking statements are based on the current beliefs and expectations of management regarding future events, and are subject to significant known and unknown risks and uncertainties. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those set forth in the forward-looking statements. You should not place undue reliance on these statements.

In particular, our expectations could be affected by, among other things:

- Uncertainties regarding the success of key products and commercial priorities;
- Global trends toward healthcare cost-containment, including ongoing government, payer and general public pricing and reimbursement pressures and requirements for increased pricing transparency;
- Uncertainties in the research and development of new healthcare products, including clinical trial results and additional analysis of existing clinical data;
- Our ability to obtain or maintain proprietary intellectual property protection, including the ultimate extent of the impact on Novartis of the loss of patent protection and exclusivity on key products that commenced in prior years and is expected to continue this year;
- The potential that the strategic benefits, operational efficiencies or opportunities expected from our recent transactions or our organizational, structural and cultural transformations may not be realized or may take longer to realize than expected;
- Our performance on environmental, social and governance measures;
- Uncertainties in the development or adoption of potentially transformational technologies and business models;
- Uncertainties regarding potential significant breaches of information security or disruptions of our information technology systems;
- Our reliance on outsourcing key business functions to third parties;
- Our ability to attract, integrate and retain key personnel and qualified individuals;
- Uncertainties regarding actual or potential legal proceedings, including, among others, litigation and other legal disputes with respect to our recent transactions, product liability litigation, litigation and investigations regarding sales and marketing practices, intellectual property disputes and government investigations generally;
- Regulatory actions or delays or government regulation generally, including potential regulatory actions or delays with respect to the development of the products described in this Annual Report;
- Our ability to comply with data privacy laws and regulations, and uncertainties regarding potential significant breaches of data privacy;
- Safety, quality, data integrity or manufacturing issues;

- General political, economic and business conditions, including the effects of and efforts to mitigate pandemic diseases such as COVID-19;
- The impact of pandemic diseases such as COVID-19 on enrollment in, initiation and completion of our clinical trials in the future, and research and development timelines;
- Uncertainties involved in predicting shareholder returns;
- Uncertainties regarding the effects of recent and anticipated future changes in tax laws and their application to us;
- Uncertainties regarding future global exchange rates; and
- Uncertainties regarding future demand for our products.

Some of these factors are discussed in more detail in this Annual Report, including under "Item 3. Key Information—Item 3.D. Risk factors," "Item 4. Information on the Company," and "Item 5. Operating and Financial Review and Prospects." Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described in this Annual Report as anticipated, believed, estimated or expected. We provide the information in this Annual Report as of the date of its filing. We do not intend, and do not assume any obligation, to update any information or forward-looking statements set out in this Annual Report as a result of new information, future events or otherwise.

PART I

Item 1. Identity of Directors, Senior Management and Advisers

Not applicable.

Item 2. Offer Statistics and Expected Timetable

Not applicable.

Item 3. Key Information

3.A Selected financial data

The selected financial information set out below has been extracted from our consolidated financial statements prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standard Board (IASB). Our consolidated financial statements for the years ended December 31, 2020, 2019 and 2018, are included in "Item 18. Financial Statements" in this Form 20-F.

All financial data should be read in conjunction with "Item 5. Operating and Financial Review and Prospects." All financial data presented in this Form 20-F are qualified in their entirety by reference to the consolidated financial statements and their notes.

	Year ended December 31,				
(USD millions, except per share information)	**2020**	2019	2018	2017	2016
INCOME STATEMENT DATA[1]					
Net sales to third parties from continuing operations	**48 659**	**47 445**	**44 751**	**42 338**	**41 975**
Operating income from continuing operations	**10 152**	**9 086**	**8 403**	**8 702**	**8 248**
Income from associated companies	673	659	6 438	1 108	703
Interest expense	– 869	– 850	– 932	– 750	– 675
Other financial income and expense	– 78	45	186	42	– 385
Income before taxes from continuing operations	**9 878**	**8 940**	**14 095**	**9 102**	**7 891**
Taxes	– 1 807	– 1 793	– 1 295	– 1 603	– 1 095
Net income from continuing operations	**8 071**	**7 147**	**12 800**	**7 499**	**6 796**
Net (loss) / income from discontinued operations before gain on distribution of Alcon Inc. to Novartis shareholders		– 101	– 186	204	– 98
Gain on distribution of Alcon Inc. to Novartis AG shareholders		4 691			
Net income/(loss) from discontinued operations		**4 590**	**– 186**	**204**	**– 98**
Group net income	**8 071**	**11 737**	**12 614**	**7 703**	**6 698**
Attributable to:					
Shareholders of Novartis AG	8 072	11 732	12 611	7 703	6 712
Non-controlling interests	– 1	5	3	0	– 14
Basic earnings per share (USD)					
Continuing operations	3.55	3.12	5.52	3.20	2.86
Discontinued operations		2.00	– 0.08	0.08	– 0.04
Total	3.55	5.12	5.44	3.28	2.82
Diluted earnings per share (USD)					
Continuing operations	3.52	3.08	5.46	3.17	2.84
Discontinued operations		1.98	– 0.08	0.08	– 0.04
Total	3.52	5.06	5.38	3.25	2.80
Cash dividends[2]	6 987	6 645	6 966	6 495	6 475
Cash dividends per share in CHF[3]	3.00	2.95	2.85	2.80	2.75
Personnel cost from continuing operations[4, 5]	13 898	13 843	13 515	12 009	11 950
Full-time equivalent associates of continuing operations at year-end[5]	105 794	103 914	104 780	102 467	99 747

[1] Continuing operations include the businesses of the Innovative Medicines and Sandoz Divisions and Corporate activities. Discontinued operations included the Alcon business, which was divested in 2019. To reflect these transactions, Novartis reported the Group's financial results for 2020 to 2016 as "continuing operations" and "discontinued operations," as required by IFRS.

[2] Cash dividends represent cash payments in the applicable year that generally relates to earnings of the previous year.

[3] Cash dividends per share represent dividends proposed that relate to earnings of the current year. Dividends for 2016 through 2019 were approved at the respective AGMs, and dividends for 2020 will be proposed to the Annual General Meeting on March 2, 2021, for approval.

[4] Personnel cost include wages, salaries, allowances, commissions and bonuses to staff, overtime, awards, holiday pay, severance payments and social welfare expenses.

[5] Own employees

(USD millions)	Year ended December 31, 2020	2019	2018	2017	2016
BALANCE SHEET DATA					
Cash, cash equivalents, and marketable securities and derivative financial instruments	11 563	11 446	15 964	9 485	7 777
Inventories	7 131	5 982	6 956	6 867	6 255
Other current assets	10 979	11 235	11 836	11 856	10 899
Non-current assets	102 386	88 866	110 000	104 871	105 193
Assets of disposal group held for sale[1]		841	807		
Total assets	**132 059**	**118 370**	**145 563**	**133 079**	**130 124**
Trade accounts payable	5 403	5 424	5 556	5 169	4 873
Other current liabilities	27 656	22 809	24 000	18 234	17 336
Non-current liabilities	42 334	34 555	37 264	35 449	33 024
Liabilities of disposal group held for sale[1]		31	51		
Total liabilities	**75 393**	**62 819**	**66 871**	**58 852**	**55 233**
Equity attributable to shareholders of Novartis AG	56 598	55 474	78 614	74 168	74 832
Non-controlling interests	68	77	78	59	59
Total equity	**56 666**	**55 551**	**78 692**	**74 227**	**74 891**
Total liabilities and equity	**132 059**	**118 370**	**145 563**	**133 079**	**130 124**
Net assets	56 666	55 551	78 692	74 227	74 891
Outstanding share capital	860	856	875	869	896
Total outstanding shares (millions)	2 257	2 265	2 311	2 317	2 374

[1] In 2019 and 2018, the disposal group held for sale related to the assets and liabilities of the planned divestment of the Sandoz US dermatology business and generic US oral solids portfolio to Aurobindo Pharma USA Inc., as announced on September 6, 2018. In March 2020, Novartis took the decision to retain these businesses. (see "Item 18. Financial Statements—Note 2. Significant transactions").

Cash dividends per share

Cash dividends are translated into US dollars at the Bloomberg Market System Rate on the payment date. Because we pay dividends in Swiss francs, exchange rate fluctuations will affect the US dollar amounts received by holders of ADRs.

Year earned	Month and year paid	Total dividend per share (CHF)	Total dividend per share (USD)
2016	March 2017	2.75	2.72
2017	March 2018	2.80	2.94
2018	March 2019	2.85	2.84
2019	March 2020	2.95	3.12
2020 [1]	March 2021	3.00	3.40[2]

[1] Dividend to be proposed at the Annual General Meeting on March 2, 2021, and to be distributed from March 8, 2021.
[2] Translated into US dollars at the December 31, 2020, rate of USD 1.135 to the Swiss franc. This translation is an example only, and should not be construed as a representation that the Swiss franc amount represents, or has been or could be converted into US dollars at that or any other rate.

3.B Capitalization and indebtedness

Not applicable.

3.C Reasons for the offer and use of proceeds

Not applicable.

3.D Risk factors

Our businesses face significant risks and uncertainties. You should carefully consider all of the information set forth in this Annual Report and in other documents we file with or furnish to the SEC, including the following risk factors, before deciding to invest in or to maintain an investment in any Novartis securities. Our business, as well as our reputation, financial condition, results of operations, and share price, could be materially adversely affected by any of these risks, as well as other risks and uncertainties not currently known to us or not currently considered material.

Strategic risks

Key products and commercial priorities

Risk description
Failure to deliver key commercial priorities and successfully launch new products

Context and potential impact
Our ability to maintain and grow our business and to replace revenue and income lost to generic, biosimilar and other competition depends heavily on the commercial success of our new or existing key products. The commercial success of these products could be impacted at any time by a number of factors, including pressure from new or existing competitive products, changes in the prescribing habits of healthcare professionals, unexpected side effects or safety signals, supply chain issues or other product shortages, pricing pressure, regulatory proceedings, changes in labeling, loss of intellectual property protection, and global pandemics. In addition, our revenue and margins could be significantly impacted by the timing and rate of commercial acceptance of new products.

We face competition from scientific advances and other company's new products. Healthcare professionals, patients and payers may choose competitor products instead of ours for various reasons, including if they perceive them to be better in terms of efficacy, safety, cost, convenience or other reasons. The commercial success of our key products and launches in the face of increasing competition and pressures on pricing requires significant attention and management focus. Such competitive products could significantly affect the revenue from our products and our results of operations. This impact could also be compounded to the extent such competition results in us making significant additional investments in research and development, marketing or sales.

Pricing, reimbursement and access

Risk description
Pricing and reimbursement pressure, including access to healthcare

Context and potential impact
Our businesses experience significant pressures on the pricing of our products and on our ability to obtain and maintain satisfactory rates of reimbursement for our products by governments, insurers and other payers. These pressures have many sources, including growth of healthcare costs as a percentage of gross domestic product; funding restrictions and policy changes; management of the COVID-19 pandemic and its impact on healthcare spending; and public controversies, political debate, investigations and legal proceedings regarding pharmaceutical pricing. Pressures on pricing may negatively impact, in parallel, both our product pricing and our market access.

In addition, we face numerous cost-containment measures imposed by governments and other payers, including government-imposed industrywide price reductions, mandatory pricing systems, reference pricing systems, payers limiting access to treatments based on cost-benefit analyses, imports of drugs from lower-cost countries to higher-cost countries, shifting of the payment burden to patients through higher co-payments and co-pay accumulator programs, limiting physicians' ability to choose among competing medicines, mandatory substitution of generic drugs for the patented equivalent, pressure on physicians to reduce the prescribing of patented prescription medicines, increasing pressure on intellectual property protections, and growing requirements for increased transparency on pricing. For more information on price controls, see "Item 4. Information on the Company—Item 4.B Business overview—Innovative Medicines—Price controls."

These challenges are expected to continue to increase in 2021 and beyond as healthcare investment into the management of the COVID-19 pandemic continues; political pressures mount; and healthcare payers around the globe, including government-controlled health authorities, insurance companies and managed care organizations, step up initiatives to reduce the overall cost of healthcare, restrict access to higher-priced new medicines, increase the use of generics, and impose overall price cuts. These factors may materially affect our ability to achieve value-based prices and maintain an acceptable return on our investments in the research and development of our products, and may impact our ability to research and develop new products.

In addition, our Sandoz Division has faced and may in the future face strong competition from other generic and biosimilar pharmaceutical companies, which aggressively compete for market share, including through significant price competition. Such competitive actions may increase the costs and risks associated with our efforts to introduce and market generic and biosimilar products, may delay the introduction or marketing of such products, and may further limit the prices at which we are able to sell these products. In particular, in the US in past years, industrywide price competition among generic pharmaceutical companies and consolidation of buyers caused significant declines in sales and profits of Sandoz.

Research and development

Risk description

Failure or delay in the research and development of new products or new indications for existing products

Context and potential impact

We engage in extensive and costly research and development activities, both through our own internal resources and through collaborations with third parties, in an effort to identify and develop new products and new indications for existing products that address unmet and changing medical needs and are commercially successful. Our ability to grow our business; to replace sales lost due to branded competition, entry of generics, or other reasons; and to bring to market products that take advantage of new and potentially disruptive technologies, including cell, gene and radioligand therapies, depends in significant part upon the success of these efforts.

Research and development of new products of our Innovative Medicines Division, including the research and development of our cell and gene therapies, is a costly, lengthy and uncertain process. Because intellectual property protections are limited in scope and duration, the longer it takes to develop a product, the less time there may be for us to recoup our research and development costs before loss of exclusivity. Failure can occur at any point in the process, including in later stages after substantial investment. In spite of such substantial investment, there can be no guarantee that our research and development activities will produce commercially successful new products that will enable us to replace revenue and income lost to competition and to grow our business. See also "Item 4. Information on the Company—Item 4.B Business overview—Innovative Medicines—Research and development" with regards to the research and development efforts of our Innovative Medicines Division.

New products must undergo intensive preclinical and clinical testing, and must be approved by means of highly complex, lengthy and expensive approval processes that can vary from country to country. Further, regulatory authorities continue to establish new and increasingly rigorous and time-consuming requirements for approval and reimbursement of new products and new indications. Similarly, the post-approval regulatory burden has also increased. These requirements make the maintenance of regulatory approvals for our products increasingly expensive, and further heighten the risk of recalls, product withdrawals, loss of market share, and loss of revenue and profitability. The clinical testing, regulatory processes and post-approval activities described above become more difficult during pandemics, such as the COVID-19 pandemic. This is primarily due to challenges related to recruiting, enrolling and treating patients in clinical trials. In addition, travel restrictions resulting from pandemics make it more difficult for regulatory authorities to inspect sites. For a further description of the research and development and approval processes for the products of our Innovative Medicines Division, see the sections headed "Research and development" and "Regulation" included in the description of our Innovative Medicines Division under "Item 4. Information on the Company—Item 4.B Business overview—Innovative Medicines."

Our Sandoz Division has made, and expects to continue to make, significant investments in the development of biotechnology-based, "biologic" medicines intended for sale as bioequivalent or "biosimilar" versions of currently marketed biotechnology products. While the development of such products typically is significantly less costly and complex than the development of the equivalent originator medicines, it is nonetheless significantly more costly and complex than that for typical small-molecule generic products. See also "Item 4. Information on the Company—Item 4.B Business overview—Sandoz—Development and registration" with regards to the research and development efforts of our Sandoz Division. In addition, many countries do not yet have fully developed legislative or regulatory pathways to facilitate the development of biosimilars and permit their sale in a manner in which they are readily substitutable alternatives to the originator product. Further delays or difficulties in the development or marketing of biosimilars could put at risk the significant investments that Sandoz has made, and will continue to make, in its Biopharmaceuticals business. Failure to successfully develop and market biosimilars could have a material adverse effect on the success of the Sandoz Division and the Group as a whole. For more information about the approval processes that must be followed to market Sandoz Division products, see "Item 4. Information on the Company—Item 4.B Business overview—Sandoz—Regulation."

Further, our research and development activities must be conducted in an ethical and compliant manner. Among other things, we are concerned with patient safety, data privacy, Current Good Clinical Practices (cGCP) requirements, data integrity, the fair treatment of patients, and animal welfare. Should we fail to properly manage such issues, we risk injury to third parties, damage to our reputation, negative financial consequences as a result of potential claims for damages, sanctions and fines, and the potential that investments in research and development activities could have no benefit to the Group. Research to find new targets for drug discovery and the therapeutic agents to treat unmet medical needs is made more difficult during pandemics, such as the COVID-19 pandemic. This is primarily due to safety-related restrictions on the ability of laboratory scientists to work in research laboratories, and impacts our ability to collaborate with academic and commercial research organizations facing similar challenges and restrictions.

Intellectual property

Risk description

Expiry, assertion or loss of intellectual property protection

Context and potential impact

Many products of our Innovative Medicines Division are protected by intellectual property rights, which may provide us with exclusive rights to market those products for a limited time and enable us to sustainably finance our research and development. However, the strength and duration of those rights can vary significantly from

product to product and country to country, and they may be successfully challenged by third parties or governmental authorities.

Loss of intellectual property protection and the introduction of generic or biosimilar competition for a patented branded medicine typically result in a significant and rapid reduction in net sales and operating income for the branded product, because generic or biosimilar manufacturers typically offer their versions at sharply lower prices. Such competition can occur after successful challenges to intellectual property rights or the regular expiration of the patent term or other intellectual property rights. Such competition can also result from the entry of generic or biosimilar versions of another medicine in the same therapeutic class as one of our drugs or in a competing therapeutic class, from a Declaration of Public Interest or the compulsory licensing of our drugs by governments, or from a general weakening of intellectual property and governing laws in certain countries around the world. In addition, generic or biosimilar manufacturers may sometimes conduct so-called "launches at risk" of products that are still under legal challenge for infringement, or whose patents are still under legal challenge for validity, before final resolution of legal proceedings.

We also rely in all aspects of our businesses on unpatented proprietary technology, know-how, trade secrets and other confidential information, which we seek to protect through various measures, including confidentiality agreements with licensees, employees, third-party collaborators, and consultants who may have access to such information. If these agreements are breached or our other protective measures should fail, then our contractual or other remedies may not be adequate to cover our losses.

We may also be subject to assertions of intellectual property rights against our innovative medicines by third parties. If successful, these actions may involve payment of damages, for example for patent infringement, and may also involve injunctive relief requiring removal of a product from the market (or removing a therapeutic indication from the product's approved labeling) for some period of time or throughout the life of the asserted intellectual property right. These damages or an injunction may have a material impact on our operating income and net sales.

In any given year, we may experience a potentially significant impact on our net sales from products that have already lost intellectual property protections, as well as products that may lose protection during the year. Because we may have substantially reduced marketing and research and development expenses related to products that are in their final years of exclusivity, the initial loss of protection for a product during a given year could also have an impact on our operating income for that year in an amount corresponding to a significant portion of the product's lost sales. The magnitude of the impact of generic or biosimilar competition on our income could depend on a number of factors, including, with respect to income in a given year, the time of year at which the generic or biosimilar competitor is launched; the ease or difficulty of manufacturing a competitor product and obtaining regulatory approval to market it; the number of generic or biosimilar competitor products approved, including whether, in the US, a single competitor is granted an exclusive marketing period; whether an authorized generic is launched; the geographies in which generic or biosimilar competitor products are approved, including the strength of the market for generic or biosimilar pharmaceutical products in such geographies, and the comparative profitability of branded pharmaceutical products in such geographies; and our ability to successfully develop and launch profitable new products to replace the income lost to generic or biosimilar competition. For more information on the patent and generic competition status of our Innovative Medicines Division products, see "Item 4. Information on the Company—Item 4.B Business overview—Innovative Medicines—Intellectual property."

Alliances, acquisitions and divestments

Risk description

Failure to identify external business opportunities or realize the expected benefits from our strategic acquisitions or divestments

Context and potential impact

As part of our strategy, from time to time we acquire and divest products or entire businesses, and enter into strategic alliances and collaborations. For example, in 2020 we completed the acquisitions of The Medicines Company and the Japanese operations and associated assets of Aspen Global Incorporated. This strategy depends in part on our ability to identity strategic external business opportunities and to move forward with such opportunities on acceptable terms.

Once a strategic transaction is agreed upon with a third party, we may not be able to complete the transaction in a timely manner or at all, nor can we be sure that pre-transaction due diligence will identify all possible issues that might arise during and after the transaction. Our efforts on such transactions can also divert management's attention from our existing businesses.

Further, after an acquisition, efforts to develop and market acquired products, to integrate the acquired business or to achieve expected synergies may fail or may not fully meet expectations, as a result of difficulties in retaining key personnel, customers and suppliers; failure to obtain marketing approval or reimbursement within expected time frames or at all; differences in corporate culture, standards, controls, processes and policies; or other factors. Acquisitions can also result in liabilities being incurred that were not known at the time of acquisition, or the creation of tax or accounting issues. Acquired businesses are not always in full compliance with legal, regulatory or Novartis standards, including, for example, Current Good Manufacturing Practices (cGMP) or cGCP standards, which can be costly and time-consuming to remedy. Also, our strategic alliances and collaborations with third parties may not achieve their intended goals and objectives within expected time frames, or at all.

Similarly, we cannot ensure that we will be able to successfully divest or spin off businesses or other assets that we have identified for this purpose, or that any completed divestment or spin-off will achieve the expected strategic benefits, operational efficiencies or opportuni-

ties, or that the divestment or spin-off will ultimately maximize shareholder value.

Environmental, social and governance matters

Risk description
Unsuccessful management of environmental, social and governance matters

Context and potential impact
Increasingly, in addition to financial results, companies are being judged by performance on a variety of environmental, social and governance (ESG) matters, which can contribute to the long-term sustainability of companies' performance. An inability to successfully perform on ESG matters can result in negative impacts to our reputation, recruitment, retention, operations, financial results, and the price of our shares.

A variety of organizations measure the performance of companies on ESG topics, and the results of these assessments are widely publicized. In addition, investment in funds that specialize in companies that perform well in such assessments are increasingly popular, and major institutional investors have publicly emphasized the importance of such ESG measures in making their investment decisions. Topics taken into account in such assessments include, among others, the unintentional costs or benefits of our actions on third parties not involved in such actions, which may impact society and the environment, such as with respect to climate change, the degradation of biodiversity, and inequality in society. In particular, the resulting costs of such actions may in the long-term impact our operations and ability to achieve our strategic goals, ultimately resulting in broader negative impacts on the value of Novartis. Therefore, the role of our Board of Directors and executive officers in supervising various sustainability issues is becoming increasingly important. In addition to the topics typically considered in such assessments in the healthcare industry, the public's ability to access our medicines is particularly important. If our advocacy and lobbying efforts are not aligned with our publicly stated ESG targets, our performance on ESG assessments may be negatively impacted.

We actively manage a broad range of such ESG matters, taking into consideration their expected impact on the sustainability of our business over time, and the potential impact of our business on society and the environment. However, in light of investors' increasing focus on ESG matters and rapidly changing views on acceptable levels of action across a range of topics, there can be no certainty that we will manage such issues successfully, or that we will successfully meet society's or investors' expectations as to our proper role.

Organizational, structural and cultural transformations

Risk description
Failure to successfully achieve our organizational, structural and cultural transformations

Context and potential impact
From time to time we reassess our business organization to ensure we have the optimal structure with which to execute our strategy. This resulted in our decision to centralize and optimize our manufacturing and business services organizations, which is currently being effected through a series of complex initiatives. For example, our Novartis Technical Operations organizational unit is currently undergoing a transformation to change its operating model by building two global operations centers that will allow our manufacturing sites to focus on their core activity, which is the manufacture of our medicines. This structural transformation is expected to be completed over the next 24 months, and a failure to complete this transformation in the expected time frame, or at all, could negatively impact our operations. We are also undertaking a cultural transformation to an "inspired, curious and unbossed" organization, which is a core organizational imperative. Inability to successfully implement this cultural change may result in cynicism and disengagement of our associates, as well as impede our ability to retain key talent in strategically important areas.

These organizational changes are being implemented in parallel and have interdependencies that could negatively impact each other and their timing of implementation. The overall extent and pace of organizational change, and the additional workload and complexity for our employees in some areas, could trigger uncertainty, stress and fatigue among employees, potentially resulting in instability within the organization that may lead to failure in delivering the desired organizational changes. As a result, the expected benefits of these organizational changes may never be fully realized or may take longer to realize than expected.

Digitalization and emerging business models

Risk description
Missed opportunities in digitalization and emerging business models

Context and potential impact
Rapid progress in medical and digital technologies and in the development of new business models is substantially transforming our industry and is creating new businesses and new opportunities for improving patient care and increasing revenue and profit, while sometimes quickly rendering established businesses uncompetitive or obsolete. Such transformations, both positive and negative, may impact our businesses. For example, numerous technology companies are seeking to enter the healthcare field, which generates opportunities for partnerships and alliances for us that may accelerate innovation and complement our current capabilities, although we also may be impacted by potential innovative technological advances among our existing competitors, through partnerships and alliances with technology companies or otherwise.

To take advantage of these opportunities, we are implementing a digital transformation strategy, with the goal of becoming an industry leader in leveraging advanced analytics and digital technologies. We expect to invest substantial resources into efforts to improve the way we use data in drug discovery and development; to improve the ways we engage with patients, doctors and other stakeholders; and to automate business processes. Our success in these efforts will depend on many

factors, including data quality, technology architecture, entering into successful partnerships and alliances with technology companies, a cultural change among our employees, attracting and retaining employees with appropriate skills and mindsets, and successfully innovating across a variety of technology fields. The COVID-19 pandemic has accelerated our digital transformation, including in the ways we engage and interact with our stakeholders, bring our products to market, and meet the needs of patients. These initiatives include the development and implementation of personalized engagement models enabled by digital technologies, the demand for which has increased in response to the COVID-19 pandemic. Our digital transformation efforts have started to gain significant traction, but we do not yet know whether they will be sustainable as they are scaled and made a part of our normal business operations. There is also no guarantee that these efforts will succeed, that we will successfully implement our digital transformation strategy, or that we will be able to do so within our budget or in the expected time frame.

At the same time, other technology companies with specialized expertise or business models and substantial resources are entering the healthcare field, from research and development to pharmaceutical distribution and delivery of care. These new entrants could disrupt our relationships with patients, healthcare professionals, customers, distributors and suppliers, with unknown potential consequences for us. Such new competitors may impact our share of the healthcare value chain, or successfully develop products or technologies that could make our products or business models uncompetitive or obsolete. The risks described above may result in our business being supplanted in whole or in part by new competitors with disruptive new technologies or business models.

Operational risks

Cybersecurity and IT systems

Risk description

Cybersecurity breaches and catastrophic loss of IT systems

Context and potential impact

We are heavily dependent on critical, complex and interdependent information technology (IT) systems, including internet-based systems to support our business processes. We also have outsourced significant parts of our IT infrastructure to third-party providers, and we currently use these providers to perform business-critical IT services for us. We are therefore vulnerable to cybersecurity attacks and incidents on such networks and systems, whether our own or those of the third-party providers we contract, and we have experienced and may in the future experience such cybersecurity threats and attacks. Cybersecurity threats and attacks take many forms, and the size, age and complexity of our IT systems make them potentially vulnerable to external and internal security threats; outages; malicious intrusions and attacks; cybercrimes, including state-sponsored cybercrimes; malware; misplaced or lost data; programming or human errors; or other similar events. In the context of the COVID-19 pandemic, the risk of such threats and attacks has increased, as virtual and remote working has become more widely used, and sensitive data is accessed by employees working in less secure, home-based environments. In addition, due to our reliance on third-party providers, we have experienced and may in the future experience interruptions, delays or outages in IT service availability due to a variety of factors outside of our control, including technical failures, natural disasters, fraud, or security attacks experienced by or caused by the third-party provider. Interruptions in the service provided by these third parties could affect our ability to perform critical tasks.

A significant information security or other event, such as a disruption or loss of availability of one or more of our IT systems, whether managed by us or a third-party service provider, has previously and could in the future negatively impact important business processes, such as the conduct of scientific research and clinical trials, the submission of data and information to health authorities, our manufacturing and supply chain processes, our shipments to customers, our compliance with legal obligations, and communication between employees and with third parties. IT issues have previously and could in the future also lead to the compromise of trade secrets or other intellectual property that could be sold and used by competitors to accelerate the development or manufacturing of competing products; to the compromise of personal financial and health information; and to the compromise of IT security data such as usernames, passwords and encryption keys, as well as security strategies and information about network infrastructure, which could allow unauthorized parties to gain access to additional systems or data. In addition, malfunctions in software or medical devices that make significant use of IT could lead to a risk of direct harm to patients.

Although we have experienced some of the events described above, to date they have not had a material impact on our operations. Nonetheless, the occurrence of any of the events described above in the future could disrupt our business operations and result in enforcement actions or liability, including potential government fines and penalties, claims for damages, and shareholder litigation or allegations that the public health, or the health of individuals, has been harmed.

Any significant events of this type could require us to expend significant resources beyond those we already invest to remediate any damage, to further modify or enhance our protective measures, and to enable the continuity of our business.

Third-party management

Risk description

Failure to maintain adequate governance and oversight over third-party relationships, and failure of third parties to meet their contractual, regulatory or other obligations

Context and potential impact

We outsource the performance of certain key business functions to third parties, and invest a significant amount of effort and resources into doing so, including to manage and oversee such third parties. Such outsourced

functions include research and development collaborations, manufacturing operations, warehousing and distribution activities, certain finance functions, sales and marketing activities, data management and others. Some of these third parties, particularly those in developing countries, do not have internal compliance systems comparable to those within our organization.

Our reliance on outsourcing and third parties for the research and development, sales or manufacturing of our products poses certain risks, including misappropriation of our intellectual property, failure of the third party to comply with regulatory and quality assurance requirements, unexpected supply disruptions, breach of the research and development or manufacturing agreement by the third party, and the unexpected termination or nonrenewal of the agreement by the third party.

In addition, governments and the public expect companies like Novartis to take responsibility for and report on compliance with various human rights, responsible sourcing and environmental practices, as well as other actions of their third-party contractors around the world.

Ultimately, if third parties fail to meet their obligations to us, we may lose our investment in the collaborations or fail to receive the expected benefits of our agreements with such third parties. In addition, should any of these third parties fail to comply with the law or our standards, or should they otherwise act inappropriately in the course of their performance of services for us, there is a risk that we could be held responsible for their acts, that our reputation may suffer, and that penalties may be imposed upon us.

Manufacturing and product quality

Risk description

Inability to ensure proper controls in product development and product manufacturing, and failure to comply with applicable regulations and standards

Context and potential impact

The development and manufacture of our products is complex and heavily regulated by governmental health authorities around the world. Whether or not our products and the related raw materials are developed and manufactured at our own manufacturing sites or by third parties, we must ensure that all development and manufacturing processes comply with regulatory requirements as well as our own quality standards. Failure to comply with regulatory requirements has resulted in, and may in the future result in, warning letters, suspension of manufacturing, seizure of products, injunctions, product recalls, failure to secure product approvals, or debarment.

In recent years, global health authorities have substantially intensified their scrutiny of manufacturers' compliance with regulatory requirements. Any significant failure by us or our third-party suppliers to comply with regulatory requirements, or with health authorities' expectations, may create the need to suspend clinical trials, shut down production facilities or production lines, and recall commercial products. A failure to fully comply with regulatory requirements could also lead to a delay in the approval of new products, an inability to ship or import our products, and significant penalties and reputational harm.

Talent management

Risk description

Inability to attract, integrate and retain key personnel and qualified individuals

Context and potential impact

We rely on a diverse, capable workforce across our businesses and functions. Novartis invests in attracting, recruiting, developing and retaining highly skilled individuals to achieve our business objectives. The loss of key personnel – including senior members of our scientific and management teams, high-quality researchers and development specialists, and skilled personnel in key markets – could delay or prevent the achievement of our major business objectives.

Our future growth will demand that we retain talented associates and leaders while also recruiting new talent who bring new skills and perspectives. The market for skilled labor has become increasingly competitive. We are experiencing challenges in attracting skilled talent in several areas, including in our Oncology business unit and for our chimeric antigen receptor T-cell (CAR-T) therapies, gene therapies and radioligand therapy products. The supply of new talent is especially limited in many of the geographies that are expected to be sources of growth for Novartis, including Emerging Growth Markets such as China, where there is a limited pool of executives and functional experts with the experience needed to work successfully in a global organization like Novartis. The geographic mobility of talent worldwide is decreasing, with ample career opportunities available closer to home to talented individuals in developed and developing countries. This decrease in mobility may be worsened by anti-immigrant sentiments in many countries, and laws discouraging immigration.

The constraints associated with lockdowns and social distancing during the COVID-19 pandemic complicated and initially slowed our talent acquisition activities. The necessity to adopt remote working across a portion of the workforce has accelerated our transition toward a new working model, in which a number of our associates have the flexibility to determine where, when and how they work. Our transition toward a more flexible working model accelerated our efforts to expand our sources to recruit talent from an increasingly global pool. We aspire to become less inhibited by job location requirements or candidate mobility preferences when searching for the highest caliber talent to fill openings. However, these efforts may not achieve the intended results in any particular time frame, or at all, or may have unanticipated negative consequences, including possible negative impacts on company culture and productivity. In addition, in many of the specialized fields from which we draw talent, such as clinical development, biosciences, chemistry, drug manufacturing and IT, and in many senior leadership positions, high demand will continue to limit the pool of external talent and increase the risk of turnover.

Legal and compliance

Risk description

Challenges in keeping up with legal and regulatory requirements, and evolving societal expectations

Context and potential impact

We are obligated to comply with the laws of all of the countries in which we operate and sell products with respect to an extremely wide and growing range of activities. Such legal requirements are extensive and complex.

The laws and regulations relevant to the healthcare industry and applicable to us are broad in scope and are subject to change and evolving interpretations, which could require us to incur substantial costs associated with compliance or to alter one or more of our business practices. For example, we have been, are currently and may in the future be subject to various significant legal proceedings, such as private party litigation, government investigations and law enforcement actions worldwide. These types of matters may take various forms based upon evolving government enforcement and private party litigation priorities, and could include matters pertaining to pricing; bribery and corruption; trade regulation and embargo legislation; product liability; commercial disputes; employment and wrongful discharge; antitrust; securities; government benefit programs; reimbursement; rebates; healthcare fraud; sales and marketing practices; insider trading; occupational health and safety; environmental regulations; tax; cybersecurity; data privacy; regulatory interactions; and intellectual property. Such activities can involve criminal proceedings, and can retroactively challenge practices previously considered to be legal.

There is also a risk that governance for our medical and patient support activities, and our interactions with governments, public officials/institutions, healthcare professionals, healthcare organizations and patient organizations may be inadequate or fail, or that we may undertake activities based on improper or inadequate scientific justification.

Our Sandoz Division may from time to time seek approval to market a generic version of a product before the expiration of patents claimed by the marketer of the patented product. We do this in cases where we believe the relevant patents are invalid or unenforceable, or would not be infringed by our generic product. As a result, affiliates of our Sandoz Division frequently face patent litigation, and in certain circumstances, we may make the business decision to market a generic product even though patent infringement actions are still pending. Should we elect to do so and conduct a so-called "launch at risk," we could face substantial damages if the final court decision is adverse to us.

Legal proceedings and investigations are inherently unpredictable, and large judgments sometimes occur. As a consequence, we may in the future incur judgments that could involve large payments, including the potential repayment of amounts allegedly obtained improperly, and other penalties, including treble damages. In addition, such legal proceedings and investigations, even if meritless, may affect our reputation, may create a risk of potential exclusion from government reimbursement programs in the US and other countries, and may lead to civil litigation. As a result, having taken into account all relevant factors, we have in the past and may again in the future enter into major settlements of such claims without bringing them to final legal adjudication by courts or other such bodies, despite having potentially significant defenses against them, in order to limit the risks they pose to our business and reputation. Such settlements may require us to pay significant sums of money and to enter into corporate integrity or similar agreements, which are intended to regulate company behavior for extended periods.

For information on significant legal matters pending against us, see "Item 18. Financial Statements—Note 22. Provisions and other non-current liabilities" and "Item 18. Financial Statements—Note 28. Commitments and contingencies."

New requirements may also be imposed on us as a result of changing government and societal expectations regarding the healthcare industry, and acceptable corporate behavior generally. For example, we are faced with laws and regulations requiring changes in how we do business, including with respect to disclosures concerning our interactions with healthcare professionals, healthcare organizations and patient organizations. These laws and regulations include requirements that we disclose payments or other transfers of value made to healthcare professionals and organizations, as well as information relating to the costs and prices for our products, which represent evolving standards of acceptable corporate behavior. These requirements may incur significant costs, including substantial time and additional resources, that are necessary to bring our interactions with healthcare professionals and organizations into compliance with these evolving standards.

In addition to legal and regulatory requirements, as a company we aim to meet the evolving societal expectations of the public and our investors regarding ethical behavior and the increasing importance placed on ESG matters.

To help us in our efforts to comply with the many requirements that impact us, we have a significant global ethics and compliance program in place, and we devote substantial time and resources to efforts to ensure that our business is conducted in a lawful and publicly acceptable manner. Despite our efforts, an actual or alleged failure to comply with law or with heightened public expectations could lead to substantial liabilities that may not be covered by insurance, or to other significant losses.

Data privacy

Risk description

Noncompliance with personal data protection laws and regulations

Context and potential impact

We operate in an environment that relies on the collection, processing, analysis and interpretation of large sets of patients' and other individuals' personal information, including via social media and mobile technologies. Also, the operation of our business requires data to flow freely across borders of numerous countries in which there are

different, and potentially conflicting, frequently changing data privacy laws in effect. For example, the EU General Data Protection Regulation (GDPR), which took effect in May 2018; the California Consumer Privacy Act, which took effect in January 2020; and Brazil's General Personal Data Protection Law, which entered into force in September 2020, impose stringent requirements on how we and third parties with whom we contract collect, share, export or otherwise process personal information, and provide for significant penalties for noncompliance. Further examples of countries with data-specific requirements governing where data is stored and whether it can be transferred outside the country are Russia and China. Breaches of our systems or those of our third-party contractors, or other failures to protect the data we collect from misuse or breach by third parties, could expose such personal information to unauthorized persons.

Any event involving the substantial loss of personal information, use of personal information without a legal basis, or other privacy violations could give rise to significant liability, reputational harm, damaged relationships with business partners, and potentially substantial monetary penalties under laws enacted or being enacted around the world. Such events could also lead to restrictions on our ability to use personal information and/or transfer personal information across country borders. In addition, there is a trend of increasing divergence of data privacy legal frameworks, not only across these frameworks but also within individual legal frameworks themselves. This divergence may constrain the implementation of global business processes and may lead to different approaches on the use of health data for scientific research, which may have a negative impact on our business and operations.

Supply chain

Risk description
Inability to maintain continuity of product supply

Context and potential impact
Many of our products are produced using technically complex manufacturing processes and require a supply of highly specialized raw materials. For some of our products and raw materials, we may rely on a single source of supply. In addition, we manufacture and sell a number of sterile products, biologic products, and products involving advanced therapy platforms, such as CAR-T therapies, gene therapies and radioligand therapy products, all of which are particularly complex and involve highly specialized manufacturing technologies. Because the production process for some of our products is complex, there is a risk of production failures, which may result in supply interruptions or product recalls due to defective product being distributed to the market.

In addition, due to the inherent complexities of our production processes, we are required to plan our production activities well in advance. If we suffer from third-party raw material shortages, underestimate market demand for a product, or fail to accurately predict when a new product will be approved for sale, then we may not be able to produce sufficient product to meet demand. These issues could be made worse during a pandemic like the COVID-19 pandemic, and can lead to (i) a sudden increase in demand for selected medicinal products, resulting in the short-term unavailability of raw material; (ii) logistical and supply challenges that may lead to our inability to ship products from one place to another due to restrictions imposed as a result of a pandemic, which can impact transportation and warehousing costs; or (iii) our inability to properly operate a production site due to restrictions imposed as the result of a pandemic.

Our or our third-party suppliers' inability to manage such issues could lead to shutdowns, to product shortages, or to our being entirely unable to supply products to patients for an extended period of time. Further, because our products are intended to promote the health of patients, such shortages or shutdowns could endanger our reputation and have led to, and could continue to lead to, significant losses of sales revenue, potential litigation or allegations that the public health, or the health of individuals, has been harmed.

Falsified medicines

Risk description
Impact on patient safety and reputational and financial harm to Novartis and our products

Context and potential impact
We continue to be challenged by the vulnerability of distribution channels to falsified medicines, which include counterfeit, stolen, tampered and illegally diverted medicines under the definition of the World Health Organization. The COVID-19 pandemic has substantially increased the presence of falsified medicines in the markets affected and on the internet. Falsified medicines pose patient safety risks and can be seriously harmful or life-threatening. Reports of adverse events related to falsified medicines and increased levels of falsified medicines in the healthcare system affect patient confidence in our genuine medicines and in healthcare systems in general. These events could also cause us substantial reputational and financial harm, and potentially lead to litigation if the adverse event from the falsified medicine is mistakenly attributed to the genuine one. Stolen or illegally diverted medicines, which are then not properly stored and are later sold through unauthorized channels, could adversely impact patient safety, our reputation and our business. Further, there is a direct financial loss when, for example, falsified medicines replace sales of genuine medicines, or genuine medicines are recalled following discovery of falsified products.

Emerging risks

Geo-political and socio-economic threats

Risk description
Negative impact of geo- and socio-political threats and economic instability

Context and potential impact
Unpredictable political conditions currently exist in various parts of the world, including a backlash in certain areas against free trade; anti-immigrant sentiment;

anti-corporatist sentiment; social unrest; fears of terrorism; risk of direct conflicts between nations; a global pandemic; and economic downturn.

The imposition of tariffs, including those imposed by the US and China, and the possibility of additional tariffs or other trade restrictions relating to trade between the US and other countries, could have a material negative impact on our business. Given that the status of trade negotiations remains subject to change, we cannot be certain of the nature or extent of the potential impact on our business. For example, if tariffs on pharmaceutical products or active pharmaceutical ingredients (APIs) were increased, this could impact the profitability of our products and disrupt our supply chain. Increasing opposition to free trade may increase the risks we face in our efforts to improve and harmonize standards in regulation and intellectual property.

Furthermore, significant conflicts continue in certain parts of the world. Collectively, such unstable conditions could, among other things, disturb the international flow of goods and increase the costs and difficulties of international transactions, which could significantly impact time to market and our ability to supply our products to patients in an undisrupted fashion, and further erode reimbursement levels for innovative therapies.

In addition, local economic conditions may adversely affect the ability of payers, as well as our distributors, customers, suppliers and service providers, to pay for our products, or otherwise to buy necessary inventory or raw materials, and to perform their obligations under agreements with us. Although we make efforts to monitor these third parties' financial condition and their liquidity, our ability to do so is limited, and some of them may become unable to pay their bills in a timely manner, or may even become insolvent. These risks may be elevated with respect to our interactions with fiscally challenged government payers, or with third parties with substantial exposure to such payers.

Our business may be impacted by economic and financial conditions directly affecting consumers. Given that in many countries, patients directly pay a large portion of their own healthcare costs, there is a risk that consumers may cut back on prescription drugs due to financial constraints.

At the same time, significant changes and potential future volatility in the financial markets, in the consumer and business environment, in the competitive landscape, and in the global political and security landscape make it increasingly difficult for us to predict our revenues and earnings. As a result, any revenue or earnings guidance or outlook that we have given or might give may be overtaken by events, or may otherwise turn out to be inaccurate. Though we endeavor to give reasonable estimates of future revenues and earnings at the time we give such guidance, based on then-current knowledge and conditions, there is a risk that such guidance or outlook will turn out to be incorrect.

Financial market issues may also result in a lower return on our financial investments, and a lower value on some of our assets. Alternatively, inflation could accelerate, which could lead to higher interest rates, increasing our costs of raising capital. Uncertainties around future central bank and other economic policies in the US and EU, as well as high debt levels in certain other countries, could also impact world trade. Sudden increases in economic, currency or financial market volatility in different countries have also impacted, and may continue to unpredictably impact, our business or results of operations, including the conversion of our operating results into our reporting currency, the US dollar, as well as the value of our investments in our pension plans.

For a discussion of effect of price controls on our business, see "Item 4. Information on the Company—Item 4.B—Business overview—Innovative Medicines—Price controls." See also "Item 5. Operating and Financial Review and Prospects—Item 5.B Liquidity and capital resources—Effects of currency fluctuations," "Item 5. Operating and Financial Review and Prospects—Item 5.B Liquidity and capital resources—Condensed consolidated balance sheets," "Item 18. Financial Statements—Note 15. Trade receivables" and "Item 18. Financial Statements—Note 29. Financial instruments—additional disclosures."

Social media and digital engagement

Risk description

Inappropriate or illegal use of social media, interactive internet platforms or mobile applications

Context and potential impact

Our increasing use of social media, interactive internet platforms and other mobile applications (together, digital engagement platforms) carries risks related to potential violations of rules regulating the promotion of prescription medicines and the potential disclosure of confidential information, trade secrets, or loss of other intellectual property. As a result of the COVID-19 pandemic, the use and rate of adoption of digital engagement platforms is increasing and expanding into new uses that may have unforeseen impacts and consequences on our business.

There continue to be uncertainties as to the rules that apply to such communications and as to the interpretations that health authorities will apply in this context, and as a result, despite our efforts to comply with applicable rules, there is a risk that our use of digital engagement platforms may cause us to be found in violation of applicable regulations.

For example, patients may use digital engagement platforms to comment on the effectiveness of a product or to report an adverse event, which may result in a failure to follow applicable adverse event reporting obligations if such platforms are not properly monitored. In addition, our associates may use digital engagement platforms inappropriately, for example to discuss our products or confidential projects, which may lead to a disclosure of confidential information, trade secrets, or loss of other intellectual property, and may give rise to liability or incur other harm to our business. Further, large numbers of or highly visible negative posts or comments about us or our executives could damage our reputation.

Global ERP implementation

Risk description

Inability to implement and properly operate our new global enterprise resource planning (ERP) system

Context and potential impact
We rely on various information and other business systems to leverage data in order to operate our complex global business. We are currently in the design and planning phase for the implementation of a new global ERP system that seeks to simplify, standardize and digitize processes in our commercial and finance functions as well as our Novartis Technical Operations unit to help ensure efficient and compliant business operations as well as the availability of high-quality data necessary to aid our decision-making. We expect the planning, design and build phase to continue through 2021, with the first implementations of our new ERP system expected to begin in the second half of 2022. We expect our new ERP system to be fully implemented by 2027, when our current system is no longer supported by the software provider. Implementing and operating a new ERP system involves certain risks, including a failure of the new system to operate as expected, a failure to properly integrate with other systems we use, potential loss of data or information, compliance issues, cost overruns and delays, and operational disruptions. Any disruptions or malfunctions of our new ERP system could cause critical information we use to be delayed, defective, corrupted, inadequate or inaccessible. In addition, if the design or implementation of our new ERP system is deficient, it could adversely affect our operations, and could negatively impact the effectiveness of our internal controls.

General risks

Indebtedness

Risk description
Our indebtedness could adversely affect our operations

Context and potential impact
As of December 31, 2020, we had USD 26.3 billion of non-current financial debt, and USD 9.8 billion of current financial debt. Our current and long-term debt requires us to dedicate a portion of our cash flow to service interest and principal payments and, if interest rates rise, this amount may increase. As a result, our existing debt may limit our ability to use our cash flow to fund capital expenditures, to engage in transactions, or to meet other capital needs, or otherwise may place us at a competitive disadvantage relative to competitors that have less debt. Our debt could also limit our flexibility to plan for and react to changes in our business or industry, and increase our vulnerability to general adverse economic and industry conditions, including changes in interest rates or a downturn in our business or the economy. We may also have difficulty refinancing our existing debt or incurring new debt on terms that we would consider to be commercially reasonable, if at all.

Intangible assets and goodwill

Risk description
Intangible assets and goodwill resulting in significant impairment charges

Context and potential impact
We carry a significant amount of goodwill and other intangible assets on our consolidated balance sheet, primarily due to acquisitions, including, in particular, substantial goodwill and other intangible assets obtained through acquisitions, including most recently through our acquisitions of The Medicines Company, *Xiidra*, Endocyte, Novartis Gene Therapies (formerly AveXis), AAA, and certain oncology products from GSK. As a result, we may incur significant impairment charges in the future if the fair value of the intangible assets and the groupings of cash-generating units containing goodwill would be less than their carrying value on the Group's consolidated balance sheet at any point in time.

We regularly review for impairment our long-lived intangible and tangible assets, including identifiable intangible assets, investments in associated companies, and goodwill. Any significant impairment charges could have a material adverse effect on our results of operations and financial condition. In 2020, for example, we recorded intangible asset impairment charges of USD 914 million.

For a detailed discussion of how we determine whether an impairment has occurred, what factors could result in an impairment, and the impact of impairment charges on our results of operations, see "Item 5. Operating and Financial Review and Prospects—Item 5.A Operating results—Critical accounting policies and estimates—Impairment of goodwill, intangible assets and property, plant and equipment," "Item 18. Financial Statements—Note 1. Significant accounting policies" and "Item 18. Financial Statements—Note 11. Goodwill and intangible assets."

Tax laws and developments

Risk description
Changes in tax laws or their application

Context and potential impact
Our multinational operations are taxed under the laws of the countries and other jurisdictions in which we operate. Changes in tax laws or in their application could lead to an increased risk of international tax disputes and an increase in our effective tax rate, which could adversely affect our financial results. The integrated nature of our worldwide operations can produce conflicting claims from revenue authorities in different countries as to the profits to be taxed in the individual countries, including potential disputes relating to the prices our subsidiaries charge one another for intercompany transactions, known as transfer pricing. The majority of the jurisdictions in which we operate have double tax treaties with other foreign jurisdictions, which provide a framework for mitigating the impact of double taxation on our revenues and capital gains. However, mechanisms developed to resolve such conflicting claims are largely untried and can be expected to be very lengthy. Accruals for tax contingencies are made based on past experience, interpretations of tax law, and judgments about potential actions by tax authorities; however, due to the complexity of tax contingencies, the ultimate resolution of any tax matter may result in payments materially different from the amounts accrued.

In 2019, the Organization for Economic Co-operation and Development (OECD) launched a new initiative on behalf of the G20 to minimize profit shifting by working toward a global tax framework that ensures that corporate income taxes are paid where consumption takes place and also introduces a global standard on minimum taxation combined with new tax dispute resolution processes. The respective principles are currently being evaluated.

The EU also adopted a new Directive on Administrative Cooperation (DAC6) in 2018, which seeks additional reporting since July 2020. Recently, the EU announced it will introduce new centralized taxation powers to address the financial impact of the COVID-19 pandemic. In addition, the European Commission continues to extend the application of its policies seeking to limit fiscal aid by member states to particular companies, and the related investigation of the member states' practices regarding the issuance of rulings on tax matters relating to individual companies.

In Switzerland, the Basel-Stadt Cantonal Tax Reform was approved by voters in February 2019, with parts retroactive from January 1, 2019. In May 2019, Swiss voters approved the Swiss Federal Tax Reform. With the enactment of this tax reform, new elements were introduced into law as of January 1, 2020.

Although we have taken steps to be in compliance with evolving initiatives like that of the OECD, the EU and of Switzerland, and will continue to do so, significant uncertainties remain as to the outcome of our efforts.

For more information, see "Item 18. Financial Statements—Note 12. Deferred tax assets and liabilities."

Foreign currency exchange rates

Risk description

Negative effect on financial results due to foreign currency exchange rate fluctuations

Context and potential impact

Changes in exchange rates between the US dollar, our reporting currency, and other currencies can result in significant increases or decreases in our reported sales, costs and earnings as expressed in US dollars, and in the reported value of our assets, liabilities and cash flows.

In addition to ordinary market risk, there is a risk that countries could take affirmative steps that could significantly impact the value of their currencies. Such steps could include "quantitative easing" measures and potential withdrawals by countries from common currencies. In addition, countries facing local financial difficulties, including countries experiencing high inflation rates and highly indebted countries facing large capital outflows, may impose controls on the exchange of foreign currency. Currency exchange controls could limit our ability to distribute retained earnings from our local affiliates, or to pay intercompany payables due from those countries.

Despite measures undertaken to reduce or hedge against foreign currency exchange risks, because a significant portion of our earnings and expenditures are in currencies other than the US dollar, including expenditures in Swiss francs that are significantly higher than our revenue in Swiss francs, any such exchange rate volatility may negatively and materially impact our results of operations and financial condition, and may impact the reported value of our net sales, earnings, assets and liabilities. In addition, the timing and extent of such volatility can be difficult to predict. Further, depending on the movements of particular foreign exchange rates, we may be materially adversely affected at a time when the same currency movements are benefiting some of our competitors.

For more information on the effects of currency fluctuations on our consolidated financial statements and on how we manage currency risk, see "Item 5. Operating and Financial Review and Prospects—Item 5.B Liquidity and capital resources—Effects of currency fluctuations" and "Item 18. Financial Statements—Note 29. Financial instruments—additional disclosures."

Key customers

Risk description

Ongoing consolidation among our distributors and retailers, and the concentration of credit risk

Context and potential impact

Increasingly, a significant portion of our global sales is made to a relatively small number of drug wholesalers, retail chains and other purchasing organizations. For example, our three most important customers globally accounted for approximately 17%, 11% and 6%, respectively, of net sales in 2020. The largest trade receivables outstanding were for these three customers, amounting to 14%, 12% and 6%, respectively, of the Group's trade receivables at December 31, 2020. The trend has been toward further consolidation among distributors and retailers. As a result, we may be affected by fluctuations in the buying patterns of such customers. Furthermore, these customers are gaining additional purchasing leverage, increasing the pricing pressures facing our businesses. These pressures can particularly impact our Sandoz Division, the generic products of which can often be obtained from numerous competitors. Moreover, we are exposed to a concentration of credit risk as a result of this concentration among our customers. If one or more of our major customers experienced financial difficulties, the effect on us would be substantial, and could include a substantial loss of sales and an inability to collect amounts owed to us.

Environmental matters

Risk description

Impact of environmental liabilities

Context and potential impact

The environmental laws of various jurisdictions impose actual and potential obligations on us to investigate and remediate contaminated sites, including in connection with activities in the past by businesses that are no longer part of Novartis. In some cases, these remediation efforts may take many years. While we have set aside substantial provisions for known worldwide environmental liabilities that are probable and estimable, there is no guarantee that additional costs will not be incurred beyond the amounts for which we have provided in the

Group consolidated financial statements. If environmental contamination related to our facilities or products adversely impacts third parties or if we fail to properly manage the safety of our facilities, including the safety of our associates and contractors, and the environmental risks, we may face substantial costs and other expenses, and be required to further increase our provisions for environmental liabilities.

See also "Item 4. Information on the Company—Item 4.D Property, plants and equipment" and "Item 18. Financial Statements—Note 20. Provisions and other non-current liabilities."

Climate change

Risk description

Climate change and increased risk of major natural disasters

Context and potential impact

Novartis is exposed to both physical risks and transition risks (which include financial, credit rating and market-driven risks) associated with climate change, which could be either acute/short-term or chronic/long-term.

Extreme weather events and changing weather patterns have become more common. As a result, we are potentially exposed to increased extreme weather and associated risks such as hurricanes, tornadoes, droughts or floods, or other events that result from the impact of climate change on the environment, such as loss of biodiversity, sea level rise or wildfires.

For example, some of our production facilities that depend on the availability of significant water supplies are located in areas where water is increasingly scarce. Other facilities are located in places that, because of increasingly violent weather events, sea level rise, or both, are increasingly at risk of substantial flooding. In regions where this risk is present, it impacts not only our own operations but also our distributed supply chain. Such events could result in increased costs, business interruptions, destruction of facilities, and loss of life.

Climate change may trigger the adoption of new regulatory requirements across the globe. Such legislation could include increased requirements to invest in technology to reduce energy use, water use and greenhouse gas emissions, beyond what we expect to invest in our existing plans. In addition, legislation could include carbon pricing, climate risk disclosure mandates, and changes in zoning or building codes to increase climate resilience. The combined impact of these transition risks could increase our direct operating costs and result in the same impact across our supply chain.

In addition, our corporate headquarters, the headquarters of our Innovative Medicines and Sandoz Divisions, and certain of our major Innovative Medicines Division production and research facilities are located near earthquake fault lines in Basel, Switzerland. Other major facilities are located near major earthquake fault lines in various locations around the world. In the event of a major earthquake, we could experience business interruptions, destruction of facilities, and loss of life.

Pension plans

Risk description

Inaccuracies in the assumptions and estimates used to calculate our pension plan and other post-employment obligations

Context and potential impact

We sponsor pension and other post-employment benefit plans in various forms that cover a significant portion of our current and former associates. For post-employment plans with defined benefit obligations, we are required to make significant assumptions and estimates about future events in calculating the expense and the present value of the liability related to these plans. These include assumptions about the discount rates we apply to estimate future defined benefit obligations and net periodic pension expense, as well as rates of future pension increases. In addition, our actuarial consultants provide our management with historical statistical information, such as withdrawal and mortality rates in connection with these estimates.

Assumptions and estimates we use may differ materially from the actual results we experience due to changing market and economic conditions, higher or lower withdrawal rates, and longer or shorter life spans of participants, among other factors. Depending on events, such differences could have a material effect on our total equity and may require us to make additional contributions to our pension funds.

For more information on obligations under retirement and other post-employment benefit plans and underlying actuarial assumptions, see "Item 5. Operating and Financial Review and Prospects—Item 5.A Operating results—Critical accounting policies and estimates—Retirement and other post-employment benefit plans" and "Item 18. Financial Statements—Note 25. Post-employment benefits for associates."

Item 4. Information on the Company

4.A History and development of Novartis

Novartis AG

Novartis AG was incorporated on February 29, 1996, under the laws of Switzerland as a stock corporation ("Aktiengesellschaft") with an indefinite duration. On December 20, 1996, our predecessor companies, Ciba-Geigy AG and Sandoz AG, merged into this new entity, creating Novartis. We are domiciled in and governed by the laws of Switzerland. Our registered office is located at the following address:

Novartis AG
Lichtstrasse 35
CH-4056 Basel, Switzerland
Telephone: +41-61-324-1111
Web: www.novartis.com

Novartis is a multinational group of companies specializing in the research, development, manufacturing and marketing of a broad range of innovative pharmaceuticals and cost-saving generic medicines. Novartis AG, our Swiss holding company, owns, directly or indirectly, all of our significant operating companies. For a list of our significant operating subsidiaries, see "Item 18. Financial Statements—Note 32. Principal Group subsidiaries and associated companies."

For a description of important corporate developments since January 1, 2018, see "Item 18. Financial Statements—Note 2. Significant Transactions."

The SEC maintains an internet site at http://www.sec.gov that contains reports, information statements, and other information regarding issuers that file electronically with the SEC.

4.B Business overview

Overview

Our purpose is to reimagine medicine to improve and extend people's lives. We use innovative science and technology to address some of society's most challenging healthcare issues. We discover and develop breakthrough treatments and find new ways to deliver them to as many people as possible. We also aim to reward those who invest their money, time and ideas in our company. Our vision is to be a trusted leader in changing the practice of medicine. Our strategy is to build a leading, focused medicines company powered by advanced therapy platforms and data science. As we implement our strategy, we have five priorities to shape our future and help us continue to create value for our company, our shareholders and society: unleash the power of our people, deliver transformative innovation, embrace operational excellence, go big on data and digital, and build trust with society.

In 2020, Novartis achieved net sales from continuing operations of USD 48.7 billion, while net income from continuing operations amounted to USD 8.1 billion, and total net income amounted to USD 8.1 billion. Headquartered in Basel, Switzerland, our Group companies employed approximately 106 000 full-time equivalent associates as of December 31, 2020. Our products are sold in approximately 155 countries around the world.

The Group comprises two global operating divisions:

- Innovative Medicines: innovative patent-protected prescription medicines
  For a description of our Innovative Medicines Division, see "—Innovative Medicines—Overview" below.
- Sandoz: generic pharmaceuticals and biosimilars
  For a description of our Sandoz Division, see "—Sandoz" below.

Our divisions are supported by the following organizational units: the Novartis Institutes for BioMedical Research (NIBR), Global Drug Development (GDD), Novartis Technical Operations (NTO) and Novartis Business Services (NBS). The financial results of these organizational units are included in the results of the divisions for which their work is performed. For more information about NIBR, see "—Innovative Medicines—Research and development—Research program" below. For more information about GDD, see "—Innovative Medicines—Research and development—Development program" below. For more information about NTO, see "—Item 4.D Property, plants and equipment." For more information about NBS, see "Item 18. Financial Statements—Note 3. Segmentation of key figures 2020, 2019 and 2018."

Corporate activities

We separately report the results of Corporate activities. The financial results of our Corporate activities include the costs of the Group headquarters and those of corporate coordination functions in major countries. In addi-

tion, Corporate includes other items of income and expense that are not attributable to specific segments, such as certain revenues from intellectual property rights and certain expenses related to post-employment benefits, environmental remediation liabilities, charitable activities, donations and sponsorships.

Innovative Medicines

Overview

Our Innovative Medicines Division is a world leader in offering patent-protected medicines to patients and physicians. The Innovative Medicines Division researches, develops, manufactures, distributes and sells patented pharmaceuticals, and is composed of two global business units: Novartis Oncology and Novartis Pharmaceuticals.

The Novartis Oncology business unit is responsible for the commercialization of products in the areas of cancer and hematologic disorders. The Novartis Pharmaceuticals business unit is organized into the following global business franchises responsible for the commercialization of various products in their respective therapeutic areas: Immunology, Hepatology and Dermatology; Ophthalmology; Neuroscience; Cardiovascular, Renal and Metabolism; Respiratory; and Established Medicines.

The Innovative Medicines Division is the larger of our two divisions in terms of consolidated net sales. It reported consolidated net sales of USD 39.0 billion in 2020, which represented 80% of the Group's net sales.

The product portfolio of the Innovative Medicines Division includes a significant number of key marketed products, many of which are among the leaders in their respective therapeutic areas.

Innovative Medicines Division products

The following summaries describe certain key marketed products in our Innovative Medicines Division, listed according to year-end net sales within each franchise. While we typically seek to sell our marketed products throughout the world, not all products and indications are available in every country. Therefore, the indications described in these summaries may vary by country. In addition, a product may be available under different brand names depending on country and indication. Some of the products described below have lost patent protection or are otherwise subject to generic competition. Others are subject to patent challenges by potential generic competitors. Please see "—Intellectual property" for general information on intellectual property and regulatory data protection, and for further information on the status of patents and exclusivity for Innovative Medicines Division products.

Key marketed products
Novartis Oncology business unit
Oncology

- *Tasigna* (nilotinib) is an oral tyrosine kinase inhibitor targeting the BCR-ABL protein. It is approved in the US, the EU and other countries to treat:
  - Patients with Philadelphia chromosome-positive chronic myeloid leukemia (Ph+ CML) in the chronic and/or accelerated phase who are resistant or intolerant to existing treatment. Ph+ CML is a cancer that starts in the blood-forming cells of bone marrow
  - Newly diagnosed adults and children with Ph+ CML in the chronic phase

- *Promacta/Revolade* (eltrombopag) is a once-daily oral thrombopoietin receptor agonist that works by stimulating bone marrow cells to produce platelets. It is approved in the US, the EU and other countries to treat:
  - Immune thrombocytopenia (ITP) in patients who have had an insufficient response to or have failed previous therapies. ITP is a bleeding disorder caused by an unusually low number of platelets
  - Thrombocytopenia in patients with chronic hepatitis C to allow them to initiate and maintain interferon-based therapy
  - Patients with severe aplastic anemia (SAA). SAA is a condition in which the body does not produce enough blood cells

  Promacta/Revolade is marketed under a research, development and license agreement between Novartis and RPI Finance Trust (dba Royalty Pharma), as assignee of Ligand Pharmaceuticals.

- *Tafinlar* + *Mekinist* (dabrafenib + trametinib) is an oral combination therapy. *Tafinlar* and *Mekinist* are kinase inhibitors of the BRAF and MEK1/2 proteins, respectively, approved in combination in the US, the EU and other countries to treat patients who have certain types of cancer with a change in the BRAF gene (called a BRAF V600 mutation), including:
  - Adults with unresectable or metastatic melanoma with a BRAF V600 mutation. Melanoma is a form of skin cancer; unresectable melanoma cannot be removed with surgery, and metastatic melanoma has spread to other parts of the body. *Tafinlar* and *Mekinist* are also approved as single agents for this indication
  - Adults with stage III melanoma with a BRAF V600 mutation as an adjuvant treatment (following surgery)
  - Adults with advanced non-small cell lung cancer (NSCLC) with a BRAF V600 mutation. NSCLC is the most common type of lung cancer

- Adults with locally advanced or metastatic anaplastic thyroid cancer with a BRAF V600 mutation and no satisfactory treatment options. Anaplastic thyroid cancer is a rare and aggressive form of thyroid cancer

Approved indications vary by country. Novartis has worldwide exclusive rights to develop, manufacture and commercialize trametinib granted by Japan Tobacco Inc.

- *Sandostatin* SC (octreotide acetate for injection) and *Sandostatin LAR* (octreotide acetate for injectable suspension) are somatostatin analogs approved in the US, the EU and other countries to treat:
  - Adults with acromegaly that is inadequately controlled by surgery or radiotherapy. Acromegaly is a chronic disease caused by the oversecretion of growth hormone
  - Patients with certain symptoms associated with carcinoid tumors and other types of functional gastrointestinal and pancreatic neuroendocrine tumors

  Sandostatin LAR is also approved in the EU and other countries to treat patients with advanced neuroendocrine tumors of the midgut or of unknown primary tumor origin.

- *Jakavi* (ruxolitinib) is an oral inhibitor of the JAK1 and JAK2 tyrosine kinases. It is the first therapy approved in the EU and other countries to treat:
  - Adults with myelofibrosis (MF), including primary myelofibrosis, post-polycythemia vera myelofibrosis and post-essential thrombocythemia myelofibrosis. MF is a rare blood cancer characterized by abnormal blood cell production and scarring in the bone marrow, which can lead to an enlarged spleen
  - Adults with polycythemia vera (PV) who are resistant or intolerant to a medication called hydroxyurea. PV is a rare blood cancer in which the bone marrow produces too many red blood cells, resulting in serious problems like clots

  Novartis licensed ruxolitinib from Incyte Corporation for development and commercialization in the indications of oncology, hematology and graft-versus-host disease outside the US. Incyte Corporation markets ruxolitinib as Jakafi® in the US.

- *Gleevec/Glivec* (imatinib mesylate/imatinib) is an oral tyrosine kinase inhibitor approved in the US, the EU and other countries to treat patients with certain types of cancer, including:
  - Patients with Philadelphia chromosome-positive chronic myeloid leukemia (Ph+ CML) in the chronic, accelerated or blast crisis (acute) phase. Ph+ CML is a cancer that starts in the blood-forming cells of bone marrow
  - Adults and children with Philadelphia chromosome-positive acute lymphoblastic leukemia (Ph+ ALL). Ph+ ALL is a rare subtype of the most common childhood cancer
  - Adults with KIT (CD117)-positive gastrointestinal stromal tumors (GISTs). GISTs are tumors found in the digestive system
  - Adults with advanced hypereosinophilic syndrome (HES) and/or chronic eosinophilic leukemia (CEL) who have a rearrangement of two genes called FIP1L1 and PDGFR-alpha. HES and CEL are closely related diseases in which the body produces too many eosinophils (a type of white blood cell)
  - Adults with myelodysplastic syndromes (MDS) and myeloproliferative disorders (MPD). MDS and MPD are a group of diseases of the blood and bone marrow
  - Adults with aggressive systemic mastocytosis (ASM) and dermatofibrosarcoma protuberans (DFSP) when surgery is not possible or the disease has spread. ASM is a form of mast cell disease, and DFSP is a rare skin cancer

  Approved indications vary by country.

- *Afinitor/Votubia* (everolimus) is an oral inhibitor of the mTOR pathway. *Afinitor* is approved in the US, the EU and other countries to treat patients with certain types of cancer, including:
  - Postmenopausal women with advanced hormone receptor-positive (HR+)/human epidermal growth factor receptor 2-negative (HER2-) breast cancer, in combination with the medicine exemestane, when certain other medicines have not worked. HR+/HER2- breast cancer is the most common subtype of breast cancer
  - Adults with neuroendocrine tumors of the pancreas, and non-symptomatic neuroendocrine tumors of the stomach and intestine (gastrointestinal) or lung that have progressed and cannot be treated with surgery

  Everolimus is also approved as *Afinitor/Afinitor Disperz* in the US and other countries, and as *Votubia* (tablets and dispersible tablets) in the EU, to treat certain patients with a genetic condition called tuberous sclerosis complex (TSC), including:
  - Adults with TSC and angiomyolipoma (a kidney tumor) when the tumor does not require immediate surgery
  - Adults and children with TSC and subependymal giant cell astrocytoma (a brain tumor) when the tumor cannot be removed completely by surgery

  Approved indications vary by country. Everolimus is available under the trade names *Zortress/Certican* for use in transplantation, and is exclusively licensed to Abbott Laboratories and sublicensed to Boston Scientific for use in drug-eluting stents.

- *Kisqali* (ribociclib) is an oral cyclin-dependent kinase inhibitor approved in the US, the EU and other countries to treat:
  - Pre-, peri- and postmenopausal women with hormone receptor-positive (HR+)/human epidermal growth factor receptor 2-negative (HER2-) locally advanced or metastatic breast cancer, in combination with an aromatase inhibitor as initial endo-

crine-based therapy. HR+/HER2- breast cancer is the most common subtype of breast cancer
- Postmenopausal women with HR+/HER2- locally advanced or metastatic breast cancer, in combination with fulvestrant, as first- or second-line therapy

Kisqali was developed by the Novartis Institutes for BioMedical Research under a research collaboration with Astex Pharmaceuticals.

- *Kymriah* (tisagenlecleucel) suspension for intravenous infusion is a CD19-directed genetically modified autologous chimeric antigen receptor T-cell (CAR-T) therapy. It is approved in the US, the EU and other countries to treat:
  - Patients up to 25 years old with B-cell acute lymphoblastic leukemia (ALL) that is refractory or in second or later relapse. ALL is a cancer of the lymphocytes, a type of white blood cell involved in the body's immune system
  - Adults with relapsed or refractory diffuse large B-cell lymphoma (DLBCL) after two or more lines of systemic therapy. DLBCL is the most common form of non-Hodgkin lymphoma and a cancer of the B-lymphocytes

- *Lutathera* (lutetium Lu 177 dotatate/lutetium (^{177}Lu) oxodotreotide) is an intravenous targeted radioligand therapy approved in the US, the EU and other countries to treat:
  - Adults with somatostatin receptor-positive gastroenteropancreatic neuroendocrine tumors (GEP-NETs). GEP-NETs are rare tumors found in the digestive tract, including the foregut, midgut and hindgut

- *Piqray* (alpelisib) is an oral kinase inhibitor approved in the US, the EU and other countries to treat:
  - Postmenopausal women, and men, with PIK3CA-mutated, hormone receptor-positive (HR+)/human epidermal growth factor receptor 2-negative (HER2-) locally advanced or metastatic breast cancer, in combination with fulvestrant, after disease progression following endocrine therapy as monotherapy (EU), or after disease progression on or following endocrine therapy (US). HR+/HER2- breast cancer is the most common subtype of breast cancer

- *Adakveo* (crizanlizumab) is a humanized monoclonal antibody that binds to P-selectin, a cell adhesion protein that plays a central role in the multicellular interactions that can lead to vaso-occlusion in sickle cell disease (SCD). Delivered via intravenous infusion, *Adakveo* is approved in the US, the EU and other countries to:
  - Prevent or reduce the frequency of vaso-occlusive crises (VOCs), or pain crises, in patients aged 16 years and older with SCD. SCD is a group of inherited blood disorders in which the body makes abnormally shaped red blood cells that become sticky and can block blood vessels, leading to unpredictable, painful VOCs

Novartis Pharmaceuticals business unit

Immunology, Hepatology and Dermatology[1]

- *Cosentyx* (secukinumab) is an injectable fully human monoclonal antibody that specifically inhibits interleukin-17A (IL-17A), a cytokine involved in several immunological diseases. It is approved in the US, the EU and other countries to treat:
  - Patients with moderate-to-severe plaque psoriasis. Psoriasis is a debilitating systemic inflammatory disease that is characterized by the appearance of raised, red patches on the skin
  - Adults with active ankylosing spondylitis (AS). AS is a long-term inflammatory disease that is characterized by chronic back pain and is generally visible on X-rays
  - Adults with active non-radiographic axial spondyloarthritis (nr-axSpA). nr-axSpA is a long-term inflammatory disease that is characterized by chronic back pain and is not visible on X-rays
  - Adults with active psoriatic arthritis (PsA). PsA is a type of inflammatory arthritis that results in swollen and painful joints and tendons

Ophthalmology

- *Lucentis* (ranibizumab) is a recombinant, humanized, high-affinity antibody fragment that binds to vascular endothelial growth factor A (VEGF-A), a protein that can cause the growth of blood vessels in the eye, potentially leading to vision loss. *Lucentis* is an anti-VEGF therapy that is injected into the eye. It is approved in the EU and other countries to treat patients with certain eye conditions, including:
  - Adults with neovascular (wet) age-related macular degeneration (AMD). Wet AMD develops when abnormal blood vessels grow under the macula and leak blood and other fluids in the back of the eye, which can scar the macula
  - Adults with proliferative diabetic retinopathy, non-proliferative diabetic retinopathy and/or diabetic macular edema. These conditions are complications of diabetes
  - Adults with visual impairment due to macular edema secondary to retinal vein occlusion (branch RVO or central RVO). Retinal vein occlusion is a blockage of the branch or central retinal vein, which carry blood away from the retina

[1] *Xolair* sales for all indications are reported in the Respiratory franchise.

Approved indications vary by country. *Lucentis* is licensed from Genentech, and Novartis holds the rights to commercialize the product outside the US. Genentech holds the rights to commercialize *Lucentis* in the US. For further information, see "Item 18. Financial Statements—Note 27. Transactions with related parties—Roche Holding AG."

- *Xiidra* (lifitegrast 0.5%), an LFA-1 antagonist, is a prescription eye drop designed to reduce inflammation by blocking the interaction of two key proteins. It is approved in the US and other countries to treat:
  - The signs and symptoms of dry eye disease in adults

- *Beovu* (brolucizumab) is the first humanized single-chain antibody fragment approved for clinical use. *Beovu* acts as an anti-VEGF agent and is administered via injection. It is approved in the US, the EU and other countries to treat:
  - Patients with neovascular (wet) age-related macular degeneration (AMD). Wet AMD develops when abnormal blood vessels grow under the macula and leak blood and other fluids in the back of the eye, which can scar the macula

Neuroscience

- *Gilenya* (fingolimod) is an oral sphingosine-1-phosphate (S1P) receptor modulator that crosses the blood-brain barrier to bind to the S1P receptors based in the central nervous system. It is approved:
  - In the US to treat adults and children aged 10 years and older with relapsing forms of multiple sclerosis, including clinically isolated syndrome, relapsing-remitting multiple sclerosis (RRMS) and active secondary progressive multiple sclerosis (SPMS). Multiple sclerosis is a disease in which the immune system attacks the protective covering of nerves (known as myelin)
  - In the EU to treat adults and children aged 10 years and older who have highly active RRMS despite treatment with at least one disease-modifying agent, or who have rapidly evolving severe RRMS

  Gilenya is licensed from Mitsubishi Tanabe Pharma Corporation.

- *Zolgensma* (onasemnogene abeparvovec) is a one-time intravenous gene therapy designed to address the genetic root cause of spinal muscular atrophy (SMA) by replacing the function of the missing or nonworking SMN1 gene. *Zolgensma* delivers a new working copy of the SMN1 gene into a patient's cells. It is approved in the US, the EU and other countries to treat:
  - Babies and young children who have SMA and a biallelic mutation in the SMN1 gene. SMA is a rare, genetic neuromuscular disease resulting in the progressive and irreversible loss of motor neurons, which causes muscle weakness and atrophy

- *Mayzent* (siponimod) is an oral, selective sphingosine-1-phosphate (S1P) receptor modulator that selectively binds to S1P1 and S1P5 receptors and penetrates the central nervous system, where it may impact central nervous system inflammation and repair mechanisms. It is approved:
  - In the US and other countries to treat adults with relapsing forms of multiple sclerosis, including clinically isolated syndrome, relapsing-remitting multiple sclerosis (RRMS) and active secondary progressive multiple sclerosis (SPMS). Multiple sclerosis is a disease in which the immune system attacks the protective covering of nerves (known as myelin)
  - In the EU and other countries to treat adults with active SPMS

  Approved indications vary across other countries.

- *Kesimpta* (ofatumumab) is an anti-CD20 monoclonal antibody that enables the targeted depletion of B-cells, specifically in lymph nodes. *Kesimpta* is self-administered as a once-monthly injection via the *Sensoready* autoinjector pen. It is approved in the US to treat:
  - Adults with relapsing forms of multiple sclerosis, including clinically isolated syndrome, relapsing-remitting multiple sclerosis (RRMS) and active secondary progressive multiple sclerosis (SPMS). Multiple sclerosis is a disease in which the immune system attacks the protective covering of nerves (known as myelin)

  Ofatumumab was originally developed by Genmab and licensed to GlaxoSmithKline (GSK). Novartis obtained the rights to ofatumumab from GSK across all indications.

Cardiovascular, Renal and Metabolism

- *Entresto* (sacubitril/valsartan) is an oral, first-in-class angiotensin receptor/neprilysin inhibitor. *Entresto* enhances the protective effects of a hormone system called the natriuretic peptide system, and simultaneously suppresses the harmful effects of a hormone system called the renin-angiotensin-aldosterone system. It is approved in the US, the EU and other countries to treat:
  - Adults who have symptomatic chronic heart failure with reduced ejection fraction (HFrEF). HFrEF is a disease in which the heart cannot pump enough blood
  - Children aged 1 year and older who have symptomatic heart failure with systemic left ventricular dysfunction. This is a disease in which the heart cannot pump enough blood

  Approved indications vary by country.

- *Leqvio* (inclisiran) is an injectable small-interfering RNA that reduces LDL cholesterol in patients with atherosclerotic cardiovascular disease. *Leqvio* is administered twice a year, following an initial dose and a dose at three months. It is approved in the EU to treat:
  - Adults with primary hypercholesterolemia (high cholesterol) or mixed dyslipidemia, in combination with maximally tolerated statin therapy. Mixed dyslipidemia is a disorder characterized by elevated levels of LDL cholesterol and triglycerides, and decreased levels of HDL cholesterol

Novartis obtained global rights to develop, manufacture and commercialize inclisiran under a license and collaboration agreement with Alnylam Pharmaceuticals, Inc.

Respiratory

- *Xolair* (omalizumab) is an injectable prescription medicine and the only approved antibody designed to target and block immunoglobulin E (IgE). It is approved in the US, the EU and other countries to treat:
  - Adults and children aged 6 years and older with moderate-to-severe, or severe, persistent allergic asthma
  - Adults and children aged 12 years and older with chronic spontaneous urticaria/chronic idiopathic urticaria (hives)
  - Adults with nasal polyps or chronic rhinosinusitis with nasal polyps (CRSwNP). CRSwNP is a chronic inflammation of the nose and the sinuses with the presence of benign lesions (nasal polyps) on the lining of the nasal sinuses or nasal cavity

  Approved indications vary by country. *Xolair* is provided as lyophilized powder for reconstitution, and as liquid formulation in a pre-filled syringe. Novartis co-promotes *Xolair* with Genentech in the US and shares a portion of operating income, but Novartis does not record any US sales. Novartis records all sales of *Xolair* outside the US. For further information, see "Item 18. Financial Statements—Note 27. Transactions with related parties—Roche Holding AG."

Established Medicines

- *Galvus* (vildagliptin) is an oral inhibitor of the DPP-4 enzyme approved in the EU and other countries to treat:
  - Adults with type 2 diabetes that is inadequately controlled by diet and exercise. It can be used as monotherapy; in dual combination with metformin, a sulfonylurea or a thiazolidinedione (antidiabetic medicines); in triple combination with metformin and a sulfonylurea; and as an add-on to insulin with or without metformin

  An oral single-pill combination of vildagliptin and metformin, marketed as *Eucreas/GalvusMet*, is also approved in the EU and other countries to treat adults with type 2 diabetes.

- *Diovan* (valsartan) is an oral angiotensin II receptor blocker (ARB) approved in the US, the EU and other countries to treat:
  - Adults and children with high blood pressure
  - Adults with heart failure
  - Adults with certain types of heart failure following a heart attack

  An oral single-pill combination of valsartan and hydrochlorothiazide, marketed as *Diovan HCT/Co-Diovan*, is also approved in the US, the EU and other countries to treat high blood pressure.

Compounds in development

The following table provides an overview of the key Innovative Medicines Division projects currently in the Confirmatory Development stage and may also describe certain projects in the Exploratory Development stage. Projects typically enter Confirmatory Development and become the responsibility of our Global Drug Development organization during Phase II testing. (For more information about our drug development program, see "—Research and development—Development program.") Projects are listed in alphabetical order by compound code, or by product name where applicable. Projects include those seeking to develop potential uses of new molecular entities as well as potential additional indications or new formulations for already marketed products. The table below, entitled "Projects removed from the development table since 2019," highlights changes to the table entitled "Selected development projects" from the previous year.

The year that each project entered the current phase of development refers to the year of the first patient's first visit in the first clinical trial of that phase. For projects in Phase II, the year refers to the first patient's first visit in the first Phase II trial, which can happen prior to the Confirmatory Development stage. We previously reported the current phase based on the year in which the decision to enter the phase was made, and as a result, there may be variations between the reported phases in this year's table versus last year's table. Certain previously disclosed projects, noted below, have not yet achieved "first patient, first visit" in any Phase I-III study for the reported indication and route of administration. We have included these projects in the table to maintain continuity with last year's disclosures, and have disclosed them using the reporting criteria from last year.

A reference to a project being in registration means that an application has been submitted to a health authority for marketing approval. Compounds and new indications in development are subject to required regulatory approvals and, in certain instances, contractual limitations. These compounds and indications are in various stages of development throughout the world. It may not be possible to obtain regulatory approval for any or all of the new compounds and new indications referred to in this Form 20-F in any country or in every country. See "—Regulation" for further information on the approval process.

Selected development projects

Compound/ product	Common name	Mechanism of action	Potential indication	Business franchise	Formulation/ route of administration	Year project entered current development phase	Planned filing dates/current phase
ABL001	asciminib	BCR-ABL inhibitor	Chronic myeloid leukemia, 3rd line	Oncology	Oral	2017	2021/III
ACZ885	canakinumab	IL-1 beta inhibitor	Non-small cell lung cancer, 2nd line	Oncology	Subcutaneous injection	2019	2021/III
			Non-small cell lung cancer, 1st line	Oncology	Subcutaneous injection	2018	2021/III
			Non-small cell lung cancer, adjuvant	Oncology	Subcutaneous injection	2018	2023/III
AVXS-101 (OAV101)	onasemno-gene abepar-vovec	Survival motor neuron (SMN) gene therapy	Spinal muscular atrophy (IT formulation)[1]	Neuroscience	Intrathecal injection	2018	TBC based on FDA feedback/ I/II
AVXS-201 (OAV201)	TBD	Methyl-CpG binding protein 2 (MECP2) gene therapy	Rett syndrome	Neuroscience	Intrathecal injection	2018	≥2025/I
Beovu	brolucizumab	VEGF inhibitor	Diabetic macular edema	Ophthalmology	Intravitreal injection	2018	2021/III
			Retinal vein occlusion	Ophthalmology	Intravitreal injection	2019	2023/III
			Diabetic retinopathy[2]	Ophthalmology	Intravitreal injection	2020	2023/III
BYL719	alpelisib	PI3K-alpha inhibitor	PIK3CA-related overgrowth spectrum	Oncology	Oral	2020	2021/II
			Triple negative breast cancer	Oncology	Oral	2020	2023/III
			Human epidermal growth factor receptor 2-positive (HER2+) advanced breast cancer[3]	Oncology	Oral	2020	≥2025/III
			Ovarian cancer	Oncology	Oral	2019[4]	2023/III
			Head and neck squamous cell carcinoma, 2nd and 3rd line[5]	Oncology	Oral	2019[6]	≥2025/III
CEE321	TBD	Pan-JAK inhibitor	Atopic dermatitis	Immunology, Hepatology and Dermatology	Topical	2019[7]	≥2025/I
CFZ533[8]	iscalimab	CD40 inhibitor	Renal transplantation	Immunology, Hepatology and Dermatology	Intravenous infusion	2018	≥2025/II
			Liver transplantation	Immunology, Hepatology and Dermatology	Intravenous infusion	2019	≥2025/II
			Sjögren's syndrome	Immunology, Hepatology and Dermatology	Intravenous infusion	2019	≥2025/II
Coartem	artemether + lumefantrine	PGH-1	Malaria, uncomplicated (<5 kg patients)[9]	Established Medicines	Oral	2020	2024/III
Cosentyx	secukinumab	IL-17A inhibitor	Ankylosing spondylitis head-to-head study versus Sandoz biosimilar *Hyrimoz* (adalimumab)	Immunology, Hepatology and Dermatology	Subcutaneous injection	2017	2022/III
			Hidradenitis suppurativa	Immunology, Hepatology and Dermatology	Subcutaneous injection	2019	2022/III
			Giant cell arteritis	Immunology, Hepatology and Dermatology	Subcutaneous injection	2019	2024/II
			Lichen planus	Immunology, Hepatology and Dermatology	Subcutaneous injection	2020	≥2025/II
			Lupus nephritis[10]	Immunology, Hepatology and Dermatology	Subcutaneous injection	2020	≥2025/III
			Psoriatic arthritis (IV formulation)[11]	Immunology, Hepatology and Dermatology	Intravenous infusion	2019	2022/III
			Ankylosing spondylitis (IV formulation)[12]	Immunology, Hepatology and Dermatology	Intravenous infusion	2019	2023/III
CSJ117	TBD	TSLP inhibitor	Asthma[13]	Respiratory	Inhalation	2020	≥2025/II
ECF843	TBD	rh-Lubricin	Dry eye	Ophthalmology	Topical	2020	2023/II

[1] Preclinical studies to address partial clinical hold are on track. The FDA has acknowledged the potential of AVXS-101 IT in this patient population and recommends a pivotal confirmatory study, to be initiated after partial clinical hold is lifted.
[2] Previously disclosed as proliferative diabetic retinopathy
[3] Previously disclosed as hormone receptor-negative (HR-)/human epidermal growth factor receptor 2-positive (HER2+) advanced breast cancer
[4] Reflects the year in which the decision to enter the disclosed phase was made; "first patient, first visit" has not yet occurred
[5] Previously disclosed as head and neck squamous cell carcinoma
[6] Reflects the year in which the decision to enter the disclosed phase was made; "first patient, first visit" has not yet occurred
[7] Reflects the year in which the decision to enter the disclosed phase was made; "first patient, first visit" has not yet occurred
[8] The renal transplantation and liver transplantation indications were previously disclosed as solid organ transplantation. This has since split into two separate projects.
[9] Project added to selected development projects table in 2020 – entered Confirmatory Development
[10] Project added to selected development projects table in 2020 – entered Confirmatory Development
[11] Project added to selected development projects table in 2020 – in Confirmatory Development
[12] Project added to selected development projects table in 2020 – in Confirmatory Development
[13] Previously disclosed as severe asthma

Compound/ product	Common name	Mechanism of action	Potential indication	Business franchise	Formulation/ route of administration	Year project entered current development phase	Planned filing dates/current phase
Entresto	valsartan and sacubitril (as sodium salt complex)	Angiotensin receptor/ neprilysin inhibitor	Chronic heart failure with preserved ejection fraction	Cardiovascular, Renal and Metabolism	Oral	2020	US registration
			Post-acute myocardial infarction	Cardiovascular, Renal and Metabolism	Oral	2016	2021/III
Jakavi	ruxolitinib	JAK1/2 inhibitor	Acute graft-versus-host disease	Oncology	Oral	2017	2021/III
			Chronic graft-versus-host disease	Oncology	Oral	2017	2021/III
KAE609	cipargamin	PfATP4 inhibitor	Malaria, uncomplicated[14]	Established Medicines	Oral	2017	≥2025/II
			Malaria, severe[15]	Established Medicines	Oral	2019[16]	≥2025/II
KAF156	ganaplacide	Imidazolopiperazines derivative	Malaria, uncomplicated[17]	Established Medicines	Oral	2017	≥2025/II
Kisqali	ribociclib	CDK4 inhibitor	Hormone receptor-positive (HR+)/human epidermal growth factor receptor 2-negative (HER2-) early breast cancer (adjuvant)[18]	Oncology	Oral	2018	2023/III
KJX839[19]	inclisiran	siRNA (regulation of LDL-C)	Hyperlipidemia	Cardiovascular, Renal and Metabolism	Subcutaneous injection	2020	EU approved US[20]
			Secondary prevention of cardiovascular events in patients with elevated levels of LDL-C	Cardiovascular, Renal and Metabolism	Subcutaneous injection	2018	≥2025/III
Kymriah	tisagen-lecleucel	CD19 CAR-T	Relapsed/refractory follicular lymphoma	Oncology	Intravenous infusion	2018	2021/II
			Relapsed/refractory diffuse large B-cell lymphoma in 1st relapse	Oncology	Intravenous infusion	2019	2021/III
LJC242	tropifexor, cenicriviroc (in fixed-dose combination)	FXR agonist and CCR2 inhibitor	Nonalcoholic steatohepatitis	Immunology, Hepatology and Dermatology	Oral	2018	≥2025/II
LJN452	tropifexor, licogliflozin (in fixed-dose combination)	FXR agonist and SGLT1/2 inhibitor	Nonalcoholic steatohepatitis	Immunology, Hepatology and Dermatology	Oral	2019	≥2025/II
LMI070	branaplam	SMN2 RNA splicing modulator	Spinal muscular atrophy	Neuroscience	Oral	2015	≥2025/II
LNP023	iptacopan	CFB inhibitor	IgA nephropathy	Cardiovascular, Renal and Metabolism	Oral	2018	2023/II
			C3 glomerulopathy	Cardiovascular, Renal and Metabolism	Oral	2019	2023/II
			Paroxysmal nocturnal hemoglobinuria	Cardiovascular, Renal and Metabolism	Oral	2018	2023/II
			Membranous nephropathy	Cardiovascular, Renal and Metabolism	Oral	2019	≥2025/II
LOU064	remibrutinib	BTK inhibitor	Chronic spontaneous urticaria	Immunology, Hepatology and Dermatology	Oral	2019	≥2025/II
			Sjögren's syndrome[21]	Immunology, Hepatology and Dermatology	Oral	2019	≥2025/II
Lutathera	lutetium Lu 177 dotatate/ lutetium (^{177}Lu) oxodotreotide	Radioligand therapy targeting SSTR	Gastroenteropancreatic neuroendocrine tumors, 1st line in G2/3 tumors[22]	Oncology	Intravenous infusion	2020	2023/III

[14] Previously disclosed as malaria
[15] Previously disclosed as severe malaria
[16] Reflects the year in which the decision to enter the disclosed phase was made; "first patient, first visit" has not yet occurred
[17] Previously disclosed as malaria
[18] Previously disclosed as HR+/HER2- breast cancer (adjuvant)
[19] Approved in the EU as *Leqvio* for primary hypercholesterolemia and mixed dyslipidemia
[20] Novartis received a complete response letter (CRL) from the FDA due to unresolved facility inspection-related conditions at a third-party manufacturing facility in Europe. The FDA has not raised any concerns related to the efficacy or safety of inclisiran. A response to the CRL is planned to be submitted in Q2-Q3 2021.
[21] Project added to selected development projects table in 2020 – in Confirmatory Development
[22] Project added to selected development projects table in 2020 – entered Confirmatory Development

Compound/ product	Common name	Mechanism of action	Potential indication	Business franchise	Formulation/ route of administration	Year project entered current development phase	Planned filing dates/current phase
^{177}Lu-PSMA-617	TBD	Radioligand therapy targeting PSMA	Metastatic castration-resistant prostate cancer	Oncology	Intravenous infusion	2018	2021/III
LXE408	TBD	Protozoane inhibitor	Visceral leishmaniasis	Established Medicines	Oral	2019[23]	≥2025/II
MBG453	sabatolimab	TIM-3 antagonist	Myelodysplastic syndrome	Oncology	Intravenous infusion	2020	2021/III
			Unfit acute myeloid leukemia[24]	Oncology	Intravenous infusion	2020	2024/II
OMB157[25]	ofatumumab	Anti-CD20 monoclonal antibody	Relapsing multiple sclerosis	Neuroscience	Subcutaneous injection	2020	US approved EU registration
PDR001	spartalizumab	PD-1 inhibitor	Malignant melanoma (combo)[26]	Oncology	Intravenous infusion	2018	≥2025/II
QBW251	icenticaftor	CFTR potentiator	Chronic obstructive pulmonary disease	Respiratory	Oral	2019	2024/II
QGE031	ligelizumab	IgE inhibitor	Chronic spontaneous urticaria[27]	Immunology, Hepatology and Dermatology	Subcutaneous injection	2018	2022/III
SAF312	TBD	TRPV1 antagonist	Chronic ocular surface pain	Ophthalmology	Topical	2016	2024/II
Tabrecta	capmatinib	c-MET inhibitor	Solid tumors	Oncology	Oral	2019[28]	2024/II
TQJ230	pelacarsen	ASO targeting Lp(a)	Secondary prevention of cardiovascular events in patients with elevated levels of lipoprotein(a)	Cardiovascular, Renal and Metabolism	Subcutaneous injection	2019	≥2025/III
UNR844	TBD	Reduction of disulfide bonds	Presbyopia	Ophthalmology	Topical	2019	2024/II
VAY736	ianalumab	BAFF-R inhibitor	Autoimmune hepatitis	Immunology, Hepatology and Dermatology	Subcutaneous injection	2018	≥2025/II
			Sjögren's syndrome[29]	Immunology, Hepatology and Dermatology	Subcutaneous injection	2017	≥2025/II
VPM087	gevokizumab	IL-1 beta antagonist	Colorectal cancer, 1st line	Oncology	Intravenous infusion	2019	≥2025/I
Xolair	omalizumab	IgE inhibitor	Food allergy	Respiratory	Subcutaneous injection	2019	2022/III

[23] Reflects the year in which the decision to enter the disclosed phase was made; "first patient, first visit" has not yet occurred
[24] Previously disclosed as acute myeloid leukemia
[25] Approved in the US as *Kesimpta* for relapsing multiple sclerosis
[26] Previously disclosed as metastatic melanoma (combo)
[27] Previously disclosed as chronic spontaneous urticaria/chronic idiopathic urticaria
[28] Reflects the year in which the decision to enter the disclosed phase was made; "first patient, first visit" has not yet occurred
[29] Previously disclosed as primary Sjögren's syndrome

Projects removed from the development table since 2019

Compound/ product	Potential indication	Change	Reason
AVXS-101	Spinal muscular atrophy (IV formulation)	Commercialized as *Zolgensma*	
BYL719	PIK3CA mutant hormone receptor-positive (HR+)/human epidermal growth factor receptor 2-negative (HER2-) postmenopausal advanced breast cancer, 2nd line (+ fulvestrant)	Commercialized as *Piqray*	
Cosentyx	Non-radiographic axial spondyloarthritis	Commercialized	
	Psoriatic arthritis head-to-head study versus Humira® (adalimumab)	Publication achieved	
INC280	Non-small cell lung cancer	Commercialized as *Tabrecta*	
Kymriah	Relapsed/refractory diffuse large B-cell lymphoma (+ pembrolizumab)	Removed	Development discontinued
LAM320	Multidrug-resistant tuberculosis	Removed	Planned US submission discontinued
PDR001	Metastatic BRAF V600+ melanoma (w/ *Tafinlar* + *Mekinist*)	Removed	Development discontinued
QMF149	Asthma	Commercialized as *Atectura Breezhaler*	
QVM149	Asthma	Commercialized as *Enerzair Breezhaler*	
RTH258	Neovascular (wet) age-related macular degeneration	Commercialized as *Beovu*	
SEG101	Sickle cell disease	Commercialized as *Adakveo*	
VPM087	Renal cell carcinoma, 1st line	Removed	Development discontinued
Xolair	Nasal polyps	Commercialized	
ZPL389	Atopic dermatitis	Removed	Development discontinued

Principal markets

The Innovative Medicines Division sells products in approximately 140 countries worldwide. Net sales are primarily concentrated in the US and Europe. The following table sets forth the aggregate 2020 net sales of the Innovative Medicines Division by region:

Innovative Medicines

	2020 net sales to third parties	
	USD millions	%
United States	14 342	37
Europe	13 484	35
Asia, Africa, Australasia	8 718	22
Canada and Latin America	2 469	6
Total	**39 013**	**100**
Of which in Established Markets [1]	29 643	76
Of which in Emerging Growth Markets [1]	9 370	24

[1] Emerging Growth Markets comprise all markets other than the Established Markets of the US, Canada, Western Europe, Japan, Australia and New Zealand.

Many of our Innovative Medicines Division products are used for chronic conditions that require patients to consume the product over long periods of time, ranging from months to years. However, certain of our marketed products and development projects, such as cell and gene therapies, are administered only once. Net sales of the vast majority of our products are not subject to material changes in seasonal demand.

Production

Our primary goal is to ensure the uninterrupted, timely and cost-effective supply of products that meet all product specifications and quality standards. The manufacturing of our products is highly regulated by governmental health authorities around the world, including the FDA and EMA. In addition to regulatory requirements, many of our products involve technically complex manufacturing processes or require highly specialized raw materials.

In 2020, we established five integrated manufacturing and supply platforms: large molecules, small molecules, Sandoz Technical Operations, cell and gene therapy, and local market manufacturing. We manufacture our products across these platforms at facilities worldwide, producing active pharmaceutical ingredients in our own facilities or purchasing them from third-party suppliers (see also "—Item 4.D Property, plants and equipment"). In our manufacturing network, we maintain state-of-the-art processes, with quality as a priority, and require our suppliers to adhere to the same high standards we expect from our own people and processes. Those processes include chemical and biological syntheses; sterile processing, including CAR-T cell processing; and formulation and packaging. We are constantly working to improve our existing manufacturing processes, to develop new and innovative technologies, and to review and adapt our manufacturing network to meet our needs and those of our patients and customers.

We produce raw materials for manufacturing in-house or we purchase them from a number of third-party suppliers. Where possible, we maintain multiple supply sources so that the business is not dependent on a single or limited number of suppliers. However, our ability to do so may at times be limited by regulatory or other requirements. We monitor market developments that could have an adverse effect on the supply of essential materials. Our suppliers of raw materials are required to comply with applicable regulations and Novartis quality standards.

Because the manufacturing of our products is complex and highly regulated by governmental health authorities, supply is never guaranteed. If we or our third-party suppliers fail to comply with applicable regulations, then there could be a product recall or other disruption to our production activities. We have experienced supply interruptions for our products in the past, and there can be no assurance that supply will not be interrupted again in the future. However, we have implemented a global manufacturing strategy to maximize business continuity in case of such events.

Marketing and sales

The Innovative Medicines Division serves customers with 24 432 field force representatives, as of December 31, 2020, including supervisors and administrative personnel. These trained representatives present the therapeutic risks and benefits of our products to physicians, pharmacists, hospitals, insurance groups, managed care organizations and other healthcare professionals. In the US, Novartis advertises certain products via digital and traditional media channels, including the internet, television, newspapers and magazines. Novartis also pursues co-promotion/co-marketing opportunities as well as licensing and distribution agreements with other companies in various markets.

The marketplace for healthcare is evolving: Customer groups beyond prescribers have increasing influence on treatment decisions and guidelines, while patients con-

tinue to become more informed stakeholders in their healthcare decisions and look for solutions to meet their changing needs. Novartis is responding by adapting our business practices to engage appropriately with patients, customer groups and other stakeholders, including by delivering innovative solutions to drive education, access and improved patient care.

The COVID-19 pandemic has accelerated additional changes related to marketing and sales techniques in the healthcare industry. For example, many healthcare professionals have increased their use of virtual platforms when interacting with pharmaceutical companies, and prefer to receive information in a more convenient and personalized way. In response, Novartis has expedited the planned implementation of a new customer engagement model, which combines traditional face-to-face visits with digital methods of engaging healthcare professionals. We are similarly changing our approach to engaging healthcare systems, payers and other healthcare providers.

Although specific distribution patterns vary by country, Novartis generally sells its prescription drugs primarily to wholesale and retail drug distributors, hospitals, clinics, government agencies and managed healthcare providers. The growing number of so-called "specialty" drugs in our portfolio has resulted in increased engagement with specialty pharmacies. In the US, specialty pharmacies continue to grow as a distribution channel for specialty products. Most specialty drugs can only be dispensed through specialty pharmacies that are wholly owned by national pharmacy benefit managers.

In the US, the US Centers for Medicare & Medicaid Services (CMS) is the largest single payer for healthcare services as a result of continuing changes in healthcare economics and an aging population. In addition, both commercial and government-sponsored managed care organizations continue to be among the largest groups of payers for healthcare services in the US. In other countries, national health services are often the only significant payer for healthcare services. In an effort to control prescription drug costs, almost all managed care organizations and national health services use formularies that list specific drugs that may be reimbursed and/or the level of reimbursement for each drug. Managed care organizations and national health services also increasingly use cost-benefit analyses to determine whether or not newly approved drugs will be added to a formulary and/or the level of reimbursement for that drug, and to determine whether or not to continue to reimburse existing drugs. We have dedicated teams that actively seek to optimize patient access, including formulary positions, for our products.

The trend toward consolidation among distributors and retailers of Innovative Medicines Division products continues in the US and internationally, both within country and across countries. This has increased our customers' purchasing leverage and resulted in increased pricing pressure on our products. Moreover, we are exposed to increased concentration of credit risk as a result of the consolidation among our customers.

Drug pricing is an increasingly prominent issue in many countries as healthcare spending continues to rise. This issue has received significant attention in the US (please see "—Price controls" for further information). At Novartis, we are increasing our efforts to enable patient access through innovative pricing and access initiatives in the US, Europe and other markets. These include contract structures such as pay-over-time and outcome-based agreements.

In 2019, Novartis Gene Therapies (formerly AveXis) formed an agreement with Accredo Health Group, Inc. in the US to offer a pay-over-time option of up to five years for *Zolgensma* to help ease possible short-term budget constraints for customers. Novartis Gene Therapies also offers payers outcome-based agreements for *Zolgensma* based on measures included in the clinical trial program, and has these agreements in place with both commercial and Medicaid contracts. In these agreements, if a patient has a significant negative outcome during a five-year period, Novartis Gene Therapies reimburses a percentage of the cost of the therapy relative to the time passed. Following conditional approval of *Zolgensma* in Europe in 2020, Novartis Gene Therapies established "Day One" early access agreements in multiple European countries. These agreements support early patient access by allowing a variety of customizable options, including retroactive rebates, deferred payments, installment options and outcome-based rebates.

Additionally, Novartis has established an outcome-based framework in the US for one of the approved indications of *Kymriah*, whereby the product invoice is linked to a successful outcome for each patient at an agreed milestone. Novartis also offers outcome-based agreements for approved indications of *Kymriah* and *Luxturna* in certain countries other than the US. These typically involve a full upfront payment of the product with a partial refund in case of failed outcomes, or installment payments based on successful patient outcomes at agreed milestones.

Competition

The global pharmaceutical market is highly competitive. We compete against other major international corporations that have substantial financial and other resources, as well as against smaller companies that operate regionally or nationally. Competition within the industry is intense and extends across a wide range of activities, including pricing, product characteristics, customer service, sales and marketing, and research and development.

Like other companies selling patented pharmaceuticals, Novartis faces challenges from companies selling competing patented products. Generic forms of our products may follow the expiry of intellectual property protection, and generic companies may also gain entry to the market through successfully challenging our intellectual property rights. We use legally permissible measures to defend those rights. See also "—Intellectual property" below. We also may face competition from over-the-counter (OTC) products that do not require a prescription from a physician.

There is ongoing consolidation in the pharmaceutical industry. At the same time, new entrants are looking to use their expertise to establish or expand their presence in healthcare, including technology companies

seeking to benefit from the increasing importance of data and data management in our industry.

Research and development

The discovery and development of a new drug usually requires approximately 10 to 15 years from the initial research to bringing a drug to market. This includes approximately six to eight years from Phase I clinical trials to market entry. At each of these steps, there is a substantial risk that a compound will not meet the requirements to progress further. In such an event, we may be required to abandon the development of a compound in which we have made a substantial investment.

We manage our research and development expenditures across our entire portfolio in accordance with our strategic priorities. We make decisions about whether or not to proceed with development projects on a project-by-project basis. These decisions are based on the project's potential to meet a significant unmet medical need or to improve patient outcomes, the strength of the science underlying the project, and the potential of the project (subject to the risks inherent in pharmaceutical development) to generate significant positive financial results for the Company. Once a management decision has been made to proceed with the development of a particular molecule, the level of research and development investment required will be driven by many factors. These include the medical indications for which it is being developed, the number of indications being pursued, whether the molecule is of a chemical or biological nature, the stage of development, and the level of evidence necessary to demonstrate clinical efficacy and safety.

Research program

Our research program is conducted by the Novartis Institutes for BioMedical Research (NIBR), which is the research and early development innovation engine of Novartis. NIBR is responsible for the discovery of new medicines for diseases with unmet medical need. We focus our work in areas where we believe we can have the most impact for patients. This requires the hiring and retention of highly talented employees, a focus on fundamental disease mechanisms that are relevant across different disease areas, continuous improvement in technologies for drug discovery and potential therapies, close alliances with clinical colleagues, and the establishment of strategic external alliances.

Approximately 5 600 full-time-equivalent scientists, physicians and business professionals work at NIBR sites in Basel, Switzerland; Cambridge, Massachusetts; East Hanover, New Jersey; San Diego, California; Emeryville, California; and Shanghai, China. They contribute to research into disease areas such as cardiovascular and metabolic diseases, neuroscience, oncology, muscle disorders, ophthalmology, autoimmune diseases and respiratory diseases. Research at the Friedrich Miescher Institute and the Genomics Institute of the Novartis Research Foundation focuses on basic genetic and genomic research, and the Novartis Institute for Tropical Diseases (NITD), in Emeryville, California, focuses on discovering new medicines to fight tropical diseases, including malaria and cryptosporidiosis.

All drug candidates go through proof-of-concept trials to enable an early assessment of the safety and efficacy of the drug while collecting basic information on pharmacokinetics and tolerability, and adhering to the guidance for early clinical testing set forth by health authorities. Following proof of concept, our Global Drug Development unit conducts confirmatory trials on the drug candidates.

In July 2018, we announced the decision to exit antibacterial and antiviral research. While the science for these programs is compelling, we decided to prioritize our resources in other areas where we believe we are better positioned to develop innovative medicines that will have a positive impact for patients. Since then, we have executed three out-licensing deals with Gilead Sciences, Boston Pharmaceuticals and Amplyx Pharmaceuticals for assets from our infectious diseases portfolio. However, in response to the COVID-19 pandemic, we started a robust and collaborative drug discovery effort to develop an antiviral molecule to potentially treat all coronaviruses, including the virus that causes COVID-19. This longer-term effort with the University of California, Berkeley, and other pharmaceutical companies will target the self-replication machinery that coronaviruses share.

In 2020, we discontinued early discovery research at NIBR's Shanghai site and focused our research and development activities there on expanding the scale and scope of our early clinical development and later-stage clinical trial operations to help accelerate the development of new medicines.

Development program

Our Global Drug Development (GDD) organization oversees drug development activities for our Innovative Medicines Division. GDD works collaboratively with NIBR to execute our overall pipeline strategy. The GDD organization includes centralized global functions such as Regulatory Affairs and Global Development Operations, and global Development Units aligned with our business franchises. GDD was created to improve resource allocation, technology implementation and process standardization to further increase innovation. GDD includes approximately 11 000 full-time equivalent associates worldwide.

The traditional model of development consists of three phases:

Phase I: The first clinical trials of a new compound – generally performed in a small number of healthy human volunteers – to assess the drug's safety profile, including the safe dosage range. These trials also determine how a drug is absorbed, distributed, metabolized and excreted, and the duration of its action.

Phase II: Clinical studies performed with patients who have the target disease, with the aim of continuing the Phase I safety assessment in a larger group, assessing the efficacy of the drug in the patient population, and determining the appropriate doses for further evaluation.

Phase III: Large-scale clinical studies with several hundred to several thousand patients, which are conducted

to establish the safety and efficacy of the drug in specific indications for regulatory approval. Phase III trials may also be used to compare a new drug against a current standard of care to evaluate the overall benefit-risk relationship of the new medicine.

In each of these phases, physicians monitor volunteer patients closely to assess the potential new drug's safety and efficacy.

Though we use this traditional model, we have tailored the development process to be simpler, more flexible and efficient. We divide the development process into two stages: Exploratory Development to establish proof of concept, followed by Confirmatory Development to confirm the concept in large numbers of patients. Exploratory Development consists of clinical proof-of-concept (PoC) studies, which are small clinical trials (typically involving in the range of between five and 15 patients) that combine elements of traditional Phase I/II testing. NIBR conducts these customized trials, which are designed to give early insights into issues such as safety, efficacy and toxicity for a drug in a given indication. Once a positive proof of concept has been established, the drug moves to the Confirmatory Development stage and becomes the responsibility of GDD. Confirmatory Development has elements of traditional Phase II/III testing and includes trials aimed at confirming the safety and efficacy of the drug in the given indication, leading up to submission of a dossier to health authorities for approval. This stage can also include trials that compare the drug to the current standard of care for the disease in order to evaluate the drug's overall benefit-risk profile. Further, with new treatment approaches such as gene therapy for rare diseases, elements of Exploratory and Confirmatory Development may be combined and suffice for registration under certain conditions such as high unmet medical need and clinical data showing highly favorable benefit-risk. In these cases, additional post-approval studies may be required by the regulatory authorities to continue to gather important data to further support approval.

The vast amount of data that must be collected and evaluated makes clinical testing the most time-consuming and expensive part of new drug development. The next stage in the drug development process is to seek registration for the new drug. For more information, see "—Regulation."

Our Innovation Management Board (IMB) manages our activities at each phase of clinical development. The IMB is responsible for all major aspects of our development portfolio and oversees our drug development budget as well as major project phase transitions and milestones following a positive proof-of-concept outcome, including transitions to Confirmatory Development and the decision to submit a regulatory application to the health authorities. The IMB is also responsible for the endorsement of overall development strategy, the endorsement of development project priorities, and decisions on project discontinuations. Our Chief Executive Officer chairs the IMB, and other representatives from Novartis senior management, with expertise spanning multiple fields, are among its core and extended membership.

Alliances and acquisitions

Our Innovative Medicines Division enters into business development agreements with other pharmaceutical and biotechnology companies and with academic and other institutions to develop new products and access new markets. We license products that complement our current product line and are appropriate to our business strategy. We focus on strategic alliances and acquisition activities for key disease areas and indications that we expect to be growth drivers in the future. We review products and compounds we are considering licensing, using the same criteria that we use for our own internally discovered drugs.

In January 2021, we announced a strategic collaboration agreement to in-license tislelizumab from an affiliate of BeiGene, Ltd. in major markets outside of China. Tislelizumab is an anti-PD-1 monoclonal antibody specifically designed to minimize binding to FcγR on macrophages, which accelerates the potential for Novartis to enter the large and growing checkpoint inhibitor field. Closing of this transaction is subject to expiration or early termination of the waiting period under the Hart-Scott-Rodino Antitrust Improvements Act. For additional information, see "Item 18. Financial Statements—Note 28. Commitments and contingencies—Research and development commitments."

For additional information, see "Item 18. Financial Statements—Note 2. Significant transactions."

Regulation

The international pharmaceutical industry is highly regulated. Regulatory authorities around the world administer numerous laws and regulations regarding the testing, approval, manufacturing, importing, labeling and marketing of drugs, and review the safety and efficacy of pharmaceutical products. Extensive controls exist on the non-clinical and clinical development of pharmaceutical products. These regulatory requirements, and the implementation of them by local health authorities around the globe, are a major factor in determining whether a substance can be developed into a marketable product, and the amount of time and expense associated with that development.

Health authorities, including those in the US and the EU, have high standards of technical evaluation. The introduction of new pharmaceutical products generally entails a lengthy approval process. Products must be authorized or registered prior to marketing, and such authorization or registration must subsequently be maintained. In recent years, the registration process has required increased testing and documentation for the approval of new drugs, with a corresponding increase in the expense of product introduction.

To register a pharmaceutical product, a registration dossier containing evidence establishing the safety, efficacy and quality of the product must be submitted to regulatory authorities. Generally, a therapeutic product must be registered in each country in which it will be sold. In every country, the submission of an application to a regulatory authority does not guarantee that approval to market the product will be granted. Although the criteria

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for the registration of therapeutic drugs are similar in most countries, the formal structure of the necessary registration documents and the specific requirements, including risk tolerance, of the local health authorities can vary significantly from country to country. Even if a drug is registered and marketed in one country, the registration authority in another country may request additional information from the pharmaceutical company prior to registration or even reject the product. A drug may be approved for different indications in different countries.

The registration process generally takes between six months and several years, depending on the country, the quality of the data submitted, the efficiency of the registration authority's procedures, and the nature of the product. Many countries provide for accelerated processing of registration applications for innovative products of particular therapeutic interest. In recent years, the US and the EU have made efforts to harmonize registration requirements in order to achieve shorter development and registration times for medical products. However, the requirement in many countries to negotiate selling prices or reimbursement levels with government regulators and other payers can substantially extend the time until a product may finally be available to patients.

The following provides a summary of the regulatory processes in the principal markets served by Innovative Medicines Division affiliates:

United States

In the US, applications for drug registration are submitted to and reviewed by the FDA. The FDA regulates the testing, manufacturing, labeling and approval for marketing of pharmaceutical products intended for commercialization in the US. The FDA continues to monitor the safety of pharmaceutical products after they have been approved for sale in the US market. The pharmaceutical development and registration process is typically intensive, lengthy and rigorous. When a pharmaceutical company has gathered data that it believes sufficiently demonstrates a drug's safety, efficacy and quality, then the company may file a New Drug Application (NDA) or Biologics License Application (BLA), as applicable, for the drug. The NDA or BLA must contain all the scientific information that has been gathered about the drug. This typically includes information regarding the clinical experiences of patients tested in the drug's clinical trials. A Supplemental New Drug Application (sNDA) or BLA amendment must be filed for new indications for a previously approved drug.

Once an application is submitted, the FDA assigns reviewers from its staff, including experts in biopharmaceutics, chemistry, clinical microbiology, pharmacology/toxicology, and statistics. After a complete review, these content experts provide written evaluations of the NDA or BLA. These recommendations are consolidated and are used by senior FDA staff in its final evaluation of the NDA or BLA. Based on that final evaluation, the FDA then provides to the NDA or BLA's sponsor an approval, or a "complete response" letter if the NDA or BLA application is not approved. If not approved, the letter will state the specific deficiencies in the NDA or BLA that need to be addressed. The sponsor must then submit an adequate response to the deficiencies in order to restart the review procedure.

Once the FDA has approved an NDA, BLA, sNDA or BLA amendment, the company can make the new drug available for physicians and other healthcare providers to prescribe. The drug owner must submit periodic reports to the FDA, including any cases of adverse reactions. For some medications, the FDA requires additional post-approval studies (Phase IV) to evaluate long-term effects or to gather information on the use of the product under specified conditions.

Throughout the life cycle of a product, the FDA requires compliance with standards relating to good laboratory, clinical and manufacturing practices. The FDA also requires compliance with rules pertaining to the manner in which we may promote our products.

European Union

In the EU, there are three main procedures for application for authorization to market pharmaceutical products in more than one EU member state at the same time: the centralized procedure, the mutual recognition procedure and the decentralized procedure. It is also possible to obtain a national authorization for products intended for commercialization in a single EU member state only, or for additional indications for licensed products. The procedure used for first authorization must continue to be followed for subsequent changes, e.g., to add an indication for a licensed product.

Under the centralized procedure, applications are made to the EMA for an authorization that is valid for the European Union (all member states). The centralized procedure is mandatory for all biotechnology products; new chemical entities in cancer, neurodegenerative disorders, diabetes, AIDS, autoimmune diseases and other immune dysfunctions; advanced therapy medicines, such as gene therapy, somatic cell therapy and tissue-engineered medicines; and orphan medicines (medicines for rare diseases). It is optional for other new chemical entities, innovative medicinal products, and medicines for which authorization would be in the interest of public health. When a pharmaceutical company has gathered data that it believes sufficiently demonstrates a drug's safety, efficacy and quality, the company may submit an application to the EMA. The EMA then receives and validates the application, and the specialized committee for human medicines, the CHMP, appoints a rapporteur and co-rapporteur to review it. The entire review cycle must be completed within 210 days, although there is a "clock stop" at Day 120 to allow the company to respond to questions set forth in the rapporteur and co-rapporteur's assessment report. When the company's complete response is received by the EMA, the clock restarts on Day 121. If there are further aspects of the dossier requiring clarification, the CHMP will issue further questions at Day 180, and may also request an oral explanation, in which case the sponsor must not only respond to the further questions but also appear before the committee to justify its responses. On Day 210, the CHMP will take a vote to recommend the approval or non-approval of the application, and their opinion is transferred to the EC. The final EC decision under this

centralized procedure is a decision that is applicable to all member states. This decision occurs 60 days, on average, after a positive CHMP recommendation.

Under both the mutual recognition procedure (MRP) and the decentralized procedure (DCP), the assessment is led by one member state, called the reference member state (RMS) which then liaises with other member states, known as the concerned member states. In the MRP, the company first obtains a marketing authorization in the RMS, which is then recognized by the concerned member states in 90 days. In the DCP, the application is done simultaneously in the RMS and all concerned member states. During the DCP, the RMS drafts an assessment report within 120 days. Within an additional 90 days, the concerned member states review the application and can issue objections or requests for additional information. On Day 90, each concerned member state must be assured that the product is safe and effective, and that it will cause no risks to the public health. Once an agreement has been reached, each member state grants national marketing authorizations for the product.

After receiving the marketing authorizations, the company must submit periodic safety reports to the relevant health authority (EMA for the centralized procedure, national health authorities for DCP or MRP). In addition, pharmacovigilance measures must be implemented and monitored, including the collection, evaluation and expedited reporting of adverse events, and updates to risk management plans. For some medications, post-approval studies (Phase IV) may be imposed to complement available data with additional data to evaluate long-term effects (called a Post-Approval Safety Study, or PASS) or to gather additional efficacy data (called a Post-Approval Efficacy Study, or PAES).

European marketing authorizations have an initial duration of five years. The holder of the marketing authorization must actively apply for its renewal after this first five-year period. As part of the renewal procedure, the competent authority will perform a full benefit-risk review of the product. Should the authority conclude that the benefit-risk balance is no longer positive, the marketing authorization can be suspended or revoked. Once renewed, the marketing authorization is valid for an unlimited period. If the holder does not apply for renewal, the marketing authorization automatically lapses. Any marketing authorization that is not followed within three years of its granting by the actual placing on the market of the corresponding medicinal product ceases to be valid.

Price controls

In most of the markets where we operate, the prices of pharmaceutical products are subject to both direct and indirect price controls and to drug reimbursement programs with varying price control mechanisms. Due to increasing political pressure and governmental budget constraints, we expect these mechanisms to remain robust – and potentially even to be strengthened – and to have a continued negative influence on the prices we are able to charge for our products.

Direct governmental efforts to control prices

United States: In the US, former President Donald Trump and congressional leaders declared the reduction of drug prices a key priority in 2020. Former President Trump signed an executive order that included a most favored nation (MFN) policy limiting prices in Medicare parts B and D to no greater than those paid by developed countries outside the US, and his administration finalized the rule to begin implementing a seven-year demonstration project for the MFN in Medicare Part B on January 1, 2021. However, lawsuits were filed in several US states, and the district courts granted orders delaying implementation. The Biden administration will likely determine next steps. Former President Trump also signed an executive order allowing US states to develop plans for the importation of drugs from Canada and permit personal importation from countries outside the US. These state plans must be approved by the US Department of Health and Human Services (HHS) prior to implementation. However, a lawsuit was filed against HHS challenging the importation of certain prescription drugs from Canada without drug manufacturer authorization or oversight, and in parallel, the Canadian government blocked the distribution of certain medicines outside Canada to avoid shortages within the country. It is anticipated that focus on drug pricing will continue at the federal level in 2021. Further, by December 31, 2020, 18 US states had passed legislation intended to impact pricing or requiring price transparency reporting, with five of these states also allowing for price control review boards. The disclosure requirements vary by state. Many states require multiple types of reporting, including for new drug applications, new drug launches, prior notice of price increases, and quarterly or annual reporting. It is expected in 2021 that state legislatures will continue to focus on drug pricing and that similar bills will be passed in more states.

Europe: In Europe, our operations are subject to significant price and marketing regulations. Many governments are introducing healthcare reforms in a further attempt to curb increasing healthcare costs. In some member states, these include reforms to permit the reimbursed use of off-label medicines, despite the presence of licensed alternatives on the market. In the EU, governments influence the price of pharmaceutical products through their control of national healthcare systems that fund a large part of the cost of such products to patients. The downward pressure on healthcare costs in general in the EU, particularly with regard to prescription drugs, is intense. Increasingly strict analyses are applied when evaluating the entry of new products, and as a result, access to innovative medicines is limited based on strict cost-benefit assessments. In addition, prices for marketed products are referenced within member states and across international borders, further impacting individual EU member state pricing. Member states also collaborate to enhance pricing transparency and have started conducting joint health technology assessments, joint pricing negotiations and/or joint purchasing. As an additional control for healthcare budgets, some EU countries have passed legislation to impose further mandatory rebates for pharmaceutical products and/or finan-

cial claw-backs on the pharmaceutical industry. The calculation of these rebates and claw-backs may lack transparency in some cases and can be difficult to predict.

Regulations favoring generics and biosimilars
In response to rising healthcare costs, most governments and private medical care providers have established reimbursement schemes that favor the substitution of generic pharmaceuticals for more expensive brand-name pharmaceuticals. All US states have generic substitution statutes. These statutes permit or require the dispensing pharmacist to substitute a less expensive generic drug instead of an original drug. Other countries, including many European countries, have similar laws. We expect that the pressure for generic substitution will continue to increase. In addition, the US, the EU and other jurisdictions are increasingly crafting laws and regulations encouraging the development of biosimilar versions of biologic drugs, which can also be expected to have an impact on pricing.

Cross-border sales
Price controls in one country can have an impact in other countries as a result of cross-border sales. In the EU, products that we have sold to customers in countries with stringent price controls can be legally resold to customers in other EU countries at a lower price than the price at which the product is otherwise available in the importing country (known as parallel trade). In North America, products that we have sold to customers in Canada – which has relatively stringent price controls – are sometimes resold into the US, again at a lower price than the price at which the product is otherwise sold in the US. Such imports from Canada and other countries into the US are currently illegal. However, given the increased focus on pharmaceutical prices in the US, the former Trump administration, certain members of the US Congress, and several US states continued to explore regulatory and legislative ways to allow the safe importation of pharmaceutical products into the US from select countries, including Canada. Six US states have enacted drug importation laws, but the Secretary of HHS must certify that each state's importation plan is safe and cost-effective before it can be implemented.

We expect that pressures on pricing will continue worldwide and will likely increase. Because of these pressures, there can be no certainty that in every instance we will be able to charge prices for a product that, in a particular country or in the aggregate, would enable us to earn an adequate return on our investment in that product.

Intellectual property

We attach great importance to intellectual property (IP) rights – including patents, trademarks, copyrights, know-how, trade secrets and regulatory data protection – as essential to our purpose of reimagining medicine to improve and extend people's lives, and to protect our investment in research and development, manufacturing and marketing. The IP system provides a means to attract the investments needed to conduct and sustainably finance innovative R&D, and to manage the risks inherent in our work. For example, we seek IP protection under applicable laws for significant product developments in major markets. Among other things, patents may cover the products themselves, including the product's active ingredient or ingredients and its formulation. Patents may cover processes for manufacturing a product, including processes for manufacturing intermediate substances used in the manufacture of the product. Patents may also cover particular uses of a product, such as its use to treat a particular disease, or its dosage regimen. In addition, patents may cover tests for certain diseases or biomarkers – which can improve patient outcomes when administered with certain drugs – as well as assays, research tools and other techniques used to identify new drugs. The protection afforded, which may vary from country to country, depends upon the type of patent, its duration and its scope of coverage.

In the US and other countries, the law recognizes that product development and review by the FDA and other health authorities can take an extended period, and permits an extension of patent term for a period related to the time taken for the conduct of clinical trials and for the health authority's review. However, the length of this extension and the patents to which it applies cannot be known in advance and can only be determined after the product is approved. In practice, it is not uncommon for patent term extensions (PTEs) to not fully account for the time it took to develop the product and receive marketing authorization. As a result, for example, it is rarely the case that a product's active ingredient(s) will have a full patent term at the time the product is approved by the FDA and other health authorities.

In addition to patent protection, various countries offer regulatory data protection (RDP) or marketing exclusivities for a prescribed period of time. RDP is a distinct type of IP right providing exclusivity that precludes a potential competitor from filing a regulatory application that relies on the sponsor's clinical trial data, or that precludes the regulatory authority from approving the application for a set period of time. The RDP period can vary depending upon the type of data included in the sponsor's application. When it is available, market exclusivity, unlike RDP, may preclude a competitor from obtaining marketing approval for a product even if a competitor's application relies on its own data. RDP and market exclusivity periods generally run from the date a product is approved, and so their expiration dates cannot be known with certainty until the product approval date is known and exclusivity has been granted by the relevant authorities.

United States
Patents
In the US, a patent issued for an application filed today will receive a term of 20 years from the earliest application filing date, subject to potential patent term adjustments for delays in patent issuance based upon certain delays in prosecution by the United States Patent and Trademark Office (USPTO). A US pharmaceutical patent that claims a product, method of treatment using a product, or method of manufacturing a product may also be eligible for a PTE. This type of extension may only extend the patent term for a maximum of five years, and may not

extend the patent term beyond 14 years from regulatory approval. Only one patent may be extended for any product based on FDA review.

RDP and market exclusivity

Separate from patent exclusivities, the FDA may provide RDP or market exclusivity, which runs in parallel to any patent protection.

- A new small-molecule active pharmaceutical ingredient receives five years of RDP, during which time a competitor generally may not submit or obtain approval of an application to the FDA based on a sponsor's clinical data.
- For a small-molecule active pharmaceutical ingredient, the FDA may also request that a sponsor conduct pediatric studies and, in exchange, it will grant an additional six-month period of pediatric market exclusivity if the FDA accepts the data, the sponsor makes a timely application for approval for pediatric treatment, and the sponsor has either a patent-based or regulatory-based exclusivity period for the product that can be extended.
- Orphan drug exclusivity provides seven years of market exclusivity for drugs designated by the FDA as orphan drugs, meaning drugs that treat rare diseases. During this period, a potential competitor generally may not market the same or similar drug for the same indication even if the competitor's application does not rely on data from the sponsor.
- A new biologic active pharmaceutical ingredient receives 12 years of market exclusivity, during which time a competitor generally may not market the same or similar drug.

European community

Patents

Patent applications in Europe may be filed in the European Patent Office (EPO) or in a particular country or countries. The EPO system permits a single application to be granted for the EU plus other non-EU countries such as Switzerland and Turkey. When the EPO grants a patent, it is then validated in the countries that the patent owner designates. The term of a patent granted by the EPO or a European country office is generally 20 years from the earliest application filing date. Pharmaceutical patents can be granted a further period of exclusivity under the Supplementary Protection Certificate (SPC) system. SPCs are designed, in part, to account for the time it took to receive marketing authorization of a product by the European health authorities. An SPC may be granted to provide, in combination with the patent, up to 15 years of exclusivity from the date of the first European marketing authorization. However, an SPC cannot last longer than five years. The SPC duration may be extended by a further six months if the product is the subject of an agreed pediatric investigation plan. The post-grant phase of patents, including the SPC system, is currently administered on a country-by-country basis under national laws that, while differing, are intended to (but do not always) have the same effect.

RDP and market exclusivity

Separate from patent exclusivities, the EU provides a system of regulatory data protection for authorized human medicines that runs in parallel to any patent protection. The system for drugs being approved today is usually referred to as "8+2+1" because it provides an initial period of eight years of data protection, during which a competitor cannot rely on the relevant data; a further period of two years of market exclusivity, during which the data can be used to support applications for marketing authorization but a competitive product cannot be launched; and a possible one-year extension of the market exclusivity period if, during the initial eight-year data exclusivity period, the sponsor registered a new therapeutic indication with "significant clinical benefit." This system applies both to national and centralized authorizations.

The EU also has an orphan drug exclusivity system for medicines. If a medicine is designated as an orphan drug, then it benefits from 10 years of market exclusivity after it is authorized, during which time an application for the same or similar medicine for the same indication will not generally be accepted or granted. Under certain circumstances, this exclusivity can be extended with a two-year pediatric extension.

Third-party patents and challenges to intellectual property

Third parties can challenge our IP, including patents, patent term extensions, RDP and marketing exclusivities (such as pediatric extensions and orphan drug exclusivity), through various proceedings. For example, patents in the US can be challenged in the USPTO through various proceedings, including Inter Partes Review (IPR) and Post-Grant Review (PGR) proceedings. They may also be challenged through patent infringement litigation under the Abbreviated New Drug Application (ANDA) provisions of the Hatch-Waxman Act or under the Biologics Price Competition and Innovation Act (BPCIA). In the EU, patents may be challenged through oppositions in the EPO, or national patents may be challenged in national courts or national patent offices. The outcomes of such challenges can be difficult to predict.

In addition to directly challenging our IP rights, in some circumstances a competitor may be able to market a generic version of one of our products by, for example, designing around our patents or marketing the generic product for non-patent-protected indications. Despite RDP, a competitor could opt to incur the costs of conducting its own clinical trials and preparing its own regulatory application, and avoid our RDP altogether. There is a risk that some countries may seek to impose limitations on or seek not to recognize the availability of IP rights for pharmaceutical products, or limit the extent to which such rights may be enforced. Also, even though we may own, co-own or in-license patents protecting our products, and conduct freedom-to-operate analyses, a third party may nevertheless assert that one of our products infringes a third-party patent for which we do not have a license.

As a result, there can be no assurance that our IP rights will protect our products or that we will be able to avoid adverse effects from the loss of IP protection or from third-party patents in the future.

Intellectual property protection for certain key marketed products and compounds in development

We present below additional details regarding IP protection for certain Innovative Medicines Division products. For each, we identify issued, unexpired patents by general subject matter and, in parentheses, years of expiry in, if relevant, the US and the EU. The identified patents are owned, co-owned or exclusively in-licensed by Novartis and relate to at least one dosage strength of the product or to the method of treatment or its use as it is currently approved and marketed or, in the case of a compound in development, as it is currently submitted to the FDA and/or the EMA for approval. Identification of an EU patent refers to national patents in EU countries and/or to the national patents that have been derived from a patent granted by the EPO. Novartis may own, co-own, control or have rights to additional patents, for example, relating to compound forms, methods of treatment or use, formulations, devices, processes, synthesis, purification and detection.

We identify unexpired RDP periods and, in parentheses, years of expiry if the relevant marketing authorizations have been authorized or granted. We identify certain unexpired patent term extensions and marketing exclusivities and, in parentheses, years of expiry if they are granted; their subject matter scope may be limited and is not specified. Marketing exclusivities and patent term extensions include orphan drug exclusivity (ODE), pediatric exclusivity (PE), patent term extension (PTE) and supplementary protection certificate (SPC). We designate them as "pending" if they have been applied for but not granted and include years of expiry if estimable. Such pending applications may or may not ultimately be granted.

In the case of the EU, identification of a patent, supplementary protection certificate, marketing exclusivity or regulatory data protection means grant, authorization and maintenance in at least one country. However, it could be pending, not granted, or found invalid in others.

For each product below, we indicate whether there is current generic or biosimilar competition for one or more product versions in one or more approved indications in either the US or the EU, if IP is otherwise disclosed. We identify certain enforcement actions, or ongoing challenges to the disclosed IP that have not been finally resolved, including IPRs or PGRs if instituted by the USPTO. Challenges identified as being in administrative entities, such as national patent offices, include judicial appeals from decisions of those entities. Resolution of challenges to the disclosed IP, which in the EU may involve IP in one or more EU countries, may include settlement agreements under which Novartis permits or does not permit future launch of generic versions of our products before expiration of that IP. We identify certain material terms of such settlement agreements where they could have a material adverse effect on our business. In other cases, such settlement agreements may contain confidentiality obligations restricting what may be disclosed.

For additional information regarding commercial arrangements with respect to these products, see "—Key marketed products."

Novartis Oncology business unit

Oncology

- *Tasigna*. US: Patent on compound (2023), PE (2024); three patents on salt forms (2026, 2027, 2028), three PEs (2027, 2028, 2029); patent on polymorph compound form (2026), PE (2027); two patents on capsule form (2026, 2027), two PEs (2027, 2028); patent on method of treatment (2032), PE (2032). EU: Patent on compound (2023); patent on salt form (2026); patent on polymorph compound form (2026); patent on capsule form (2027); patent on method of treatment (2030). There is no generic competition in the US or the EU. In the US, generic manufacturers have filed ANDAs challenging certain patents other than the compound patent. In the EU, the method-of-treatment patent and the capsule form patent are being opposed in the EPO.

- *Promacta/Revolade*. US: Patent on compound (2021), PTE (2022), PE (2023); two patents on compound (2021, 2021), two PEs (2021, 2021); patent on thrombocytopenia use (2021), PE (2021); patent on method of enhancing platelet production (2021), PE (2021); patent on method of enhancing platelet production using salt (2023), PE (2023); patent on salt form and thrombocytopenia use (2025), PE (2026); five patents on tablet formulations of different dose strengths (2027) (5), five PEs (2028) (5); ODE on severe aplastic anemia patients with an insufficient response to immunosuppressive therapy (2021), PE (2022); ODE on severe aplastic anemia patients in combination with standard immunosuppressive therapy (2025). EU: Patent on compound (2021), SPC (2025), PE (2025); patent on salt form (2023); patent on formulation (2027); patent on severe aplastic anemia use (2028); patent on severe aplastic anemia dosing regimen (2030). There is no generic competition in the US or the EU. In the US, generic manufacturers have filed ANDAs challenging certain patents other than the compound patent. In the EU, the formulation patent is being opposed in the EPO.

- *Tafinlar* and *Mekinist*.

  Tafinlar. US: Two patents on compound (2030, 2030); patent on method of treatment (2029). EU: Patent on compound (2029); RDP (2023). There is no generic competition in the US or the EU.

  Mekinist. US: Patent on compound (2025), PTE (2027); patent on method of treatment (2025); four patents on formulation (2032) (4). EU: Patent on compound (2025), SPC (2029); patent on formulation (2031); RDP (2025). There is no generic competition in the US or the EU.

  Use of *Mekinist* with *Tafinlar* or *Tafinlar* with *Mekinist*. US: Patent on combination (2030); two patents on method of use of combination (2025, 2030); ODE on melanoma with certain mutations (2021); ODE on non-small cell lung cancer (2024); ODE on adjuvant treatment of melanoma (2025); ODE on anaplastic thyroid cancer (2025). EU: Patent on combination (2030);

RDP (2025). There is no generic competition in the US or the EU.

- *Sandostatin* SC and *Sandostatin LAR*.

  Sandostatin SC. There is no such patent protection in the US or the EU. There is generic competition in the US and the EU.

  Sandostatin LAR. There is no such patent protection in the US or the EU. There is generic competition in some EU markets but no generic competition in the US.

- *Jakavi*. EU: Patent on compound (2026), SPC (2027); patent on salt form (2028); patent on compound for polycythemia vera (PV) use (2026); patent on salt form for PV use (2028); RDP (2023). There is no generic competition in the EU. In the EU, the salt form patent and the patent on salt form for PV use are being opposed in the EPO.

- *Gleevec/Glivec*. US: Patent on gastrointestinal stromal tumor (GIST) use (2021), PE (2022). EU: Patent on GIST use (2021); patent on tablet formulation (2023). There is generic competition in the US and the EU. National enforcement and validity actions are also ongoing on the GIST use patent in certain EU countries.

- *Afinitor/Votubia* and *Afinitor Disperz/Votubia* dispersible tablets. US: Patent on dispersible tablet formulation (2022), PE (2023); patent on tuberous sclerosis complex (TSC)/subependymal giant cell astrocytoma (SEGA) use (2022), PE (2022); patent on breast cancer use (2022), PE (2022); patent on renal cell carcinoma use (2025), PE (2026); patent on pancreatic neuroendocrine tumor use (2028); ODE for *Afinitor* on neuroendocrine tumors of gastrointestinal or lung origin (2023); ODE for *Afinitor Disperz* on tuberous sclerosis (2025). EU: Two patents on dispersible tablet formulation (2022, 2022); patent on breast cancer use (2022); patent on renal cell carcinoma use (2022); patent on neuroendocrine tumors of pancreatic origin use (2022); patent on neuroendocrine tumors of lung origin use (2022); patent on TSC/SEGA, TSC/renal angiomyolipoma and TSC/seizures use (2027); ODE (*Votubia*, tuberous sclerosis) (2023). There is generic competition in the EU, and in the US for the three lower-dosage strengths for *Afinitor*. In the US, Novartis has resolved patent litigation relating to *Afinitor*, which may result in further generic competition prior to the expiration in February 2022 of the breast cancer use patent. Also in the US, Novartis has resolved patent litigation relating to *Afinitor Disperz*, which may result in generic competition prior to the expiration in February 2022 of the TSC use patent. In the EU, the breast cancer use patent, the TSC/SEGA, TSC/renal angiomyolipoma and TSC/seizures use patent, the renal cell carcinoma use patent, and the use patents on neuroendocrine tumors of pancreatic origin and of lung origin are being opposed in the EPO. National enforcement and validity actions are also ongoing on some of these patents in certain EU countries.

- *Kisqali*. US: Three patents on compound (2028, 2030, 2031), PTE pending (2031); three patents on methods of treatment (2029, 2029, 2031); patent on salt form (2031); RDP (2022). EU: Patent on compound (2027); patent on compound (2029), SPC (2032); patent on salt form (2031); patent on methods of use (2029); RDP (2027). There is no generic competition in the US or the EU.

- *Kymriah*. US: Seven patents on cells and/or pharmaceutical compositions comprising the cells (2031) (7); four patents on methods of use of cells and/or pharmaceutical compositions comprising the cells (2031) (4); RDP (2029), PE (2030); ODE for relapsed or refractory (r/r) pediatric acute lymphoblastic leukemia (2024), PE (2025); ODE for r/r diffuse large B-cell lymphoma (2025), PE (2025). EU: Patent on methods of use (2031), SPC (2033); RDP (2028); ODE (2028), PE (2030). There is no generic competition in the US or the EU.

- *Lutathera*. US: Patent on formulation (2038); patent on formulation process (2038); RDP (2023); ODE (2025). EU: RDP (2027); ODE (2027). There is no generic competition in the US or the EU.

- *Piqray*. US: Patent on compound (2029); patent on compound and use (2030), PTE pending (2033); RDP (2024). EU: Patent on compound and use (2029), SPC (2034); RDP (2030). There is no generic competition in the US or the EU.

- *Adakveo*. US: Patent on composition of matter (2028), PTE pending (2032); patent on methods of treatment (2027); RDP (2031), PE (2032); ODE (2026). EU: Patent on composition of matter (2027); patent on dissociation use (2031); RDP (2030); ODE (2030). There is no generic competition in the US or the EU.

Novartis Pharmaceuticals business unit

Immunology, Hepatology and Dermatology

- *Cosentyx*. US: Patent on composition of matter (2026), PTE (2029); patent on psoriasis use (2032); patent on ankylosing spondylitis use (2033); RDP (2027). EU: Patent on composition of matter (2025), SPC (2030), PE (2030); patent on psoriasis use (2031); RDP (2026). There is no generic competition in the US or the EU.

Ophthalmology

- *Lucentis*. EU: Patent on composition of matter (2018), SPC (2022), PE (2022). There is no generic competition in the EU. In the EU, the pre-filled syringe patent is being opposed in the EPO.

- *Xiidra*. US: Patent on compound (2024); three patents on compound and use (2024, 2024, 2025); patent on formulation (2024); five patents on method of treatment (2024, 2024, 2026, 2029, 2029); two patents on polymorph compound form (2029, 2029); RDP (2021). PTE pending. There is no generic competition in the US. *Xiidra* is not marketed in the EU. In the US, the compound, compound and use, formulation, method of treatment, and polymorph compound form patents are being challenged in ANDA proceedings against a generic manufacturer.

- *Beovu*. US: Patent on composition of matter (2029), PTE pending (2033); patent on method of treatment (2029); patent on nucleic acid molecule (2029); patent on antibodies (2023); patent on dosing regimen (2035); RDP (2031). EU: Two patents on composition of matter (2029, 2029), SPC (2034); patent on antibodies (2023); RDP (2030). There is no generic competition in the US or the EU.

Neuroscience

- *Gilenya*. US: Patent on dosage regimen (2027), PE (2027); patent on 0.25 mg formulation (2032), PE (2032); patent on method of treatment (2027); RDP for pediatric use and 0.25 mg (2021), PE (2021). EU: Patent on formulation (2024), SPC (2026); patent on 0.25 mg formulation (2032); RDP (2022). There is no generic competition in the US or the EU. In the US, the dosage regimen patent is being challenged in ANDA proceedings against a generic manufacturer and was upheld as being valid and infringed. The decision has been appealed. In parallel, an appeal against a USPTO decision upholding that patent in IPR proceedings is ongoing. Novartis is also enforcing the method of treatment patent against a generic manufacturer. Novartis has entered into settlement agreements with a number of manufacturers that had filed ANDAs to market a generic version of 0.5 mg *Gilenya*. Under the confidential terms of these settlements, these ANDA filers will be able to launch a generic version of 0.5 mg *Gilenya* on an agreed-upon date that is prior to the expiration of the dosage regimen patent.

- *Zolgensma*. US: Three patents on vector (2024, 2024, 2026); two patents on methods of treatment (2028, 2028); ODE for spinal muscular atrophy (SMA) in patients less than 2 years old with biallelic mutations in the SMN1 gene (2026); RDP (2031). EU: Two patents on vector (2024, 2028); two patents on methods of use (2028, 2028); ODE for SMA in patients with a biallelic mutation in the SMN1 gene, or patients with a biallelic mutation in the SMN1 gene and up to three copies of the SMN2 gene (2030); RDP (2030). There is no generic competition in the US or the EU.

- *Mayzent*. US: Patent on compound (2024); patent on treatment initiation use (2030); RDP (2024). PTE pending. EU: Patent on compound (2024); patent on solid form (2029); patent on treatment initiation use (2029), SPC (2034); patent on formulation (2032); RDP (2030). There is no generic competition in the US or the EU.

- *Kesimpta*. US: Patent on compound (2031); RDP (2021). EU: Three patents on compound (2023) (3); two patents on formulation (2028, 2028); patent on dosing regimen (2037). There is no generic competition in the US. *Kesimpta* is not currently marketed in the EU.

Cardiovascular, Renal and Metabolism

- *Entresto*. US: Four patents on combination (2023) (4), four PEs (2023 (3), 2024); two patents on complex (2026, 2027), two PEs (2027, 2027); RDP for new pediatric patient population (2022), PE (2023). PTE pending. EU: Patent on combination (2023), SPC (2028); two patents on complex (2026, 2026), two SPCs (2030, pending 2030); patent on method of use (2034); RDP (2025). There is no generic competition in the US or the EU. In the US, two combination patents and the two complex patents are being challenged in ANDA proceedings against generic manufacturers. In the EU, the two complex patents and the use patent are being opposed in the EPO.

- *Leqvio*. US: Patent on composition of matter (2034), anticipated PTE (2035); patent on dosing regimen (2036). EU: Patent on composition of matter (2033), anticipated SPC (2035); RDP (2030). There is no generic competition in the EU. *Leqvio* is not currently marketed in the US.

Respiratory

- *Xolair*. US: Two patents on syringe formulation (2021, 2025). EU: Two patents on syringe formulation (2021, 2024). There is no generic competition in the US or the EU.

Established Medicines

- *Galvus* and *Eucreas*. EU: Patent on compound (2019), SPC (2022); patent on combination (2021), SPC (2022); patent on *Galvus* formulation (2025); patent on *Eucreas* formulation (2026). *Galvus/Eucreas* is not marketed in the US. There is generic competition for *Galvus* and *Eucreas* in some EU countries. The EU *Galvus* formulation patent is being opposed in the EPO.

- *Diovan* and *Co-Diovan/Diovan HCT*. *Diovan*: There is no such patent protection for *Diovan* in the US or the EU. There is generic competition in the US and the EU. *Co-Diovan/Diovan HCT*: There is no such patent protection for *Co-Diovan/Diovan HCT* in the US or the EU. There is generic competition in the US and the EU.

Compounds in development

We provide patent information for non-marketed compounds in development that have been submitted to the FDA and/or the EMA for registration but have not yet been approved by either agency. We currently do not have any non-marketed compounds in development that have been submitted for registration but have not yet been approved by either agency.

Sandoz

Our Sandoz Division is a global leader in generic pharmaceuticals and biosimilars, and sells products in well over 100 countries. In 2020, the Sandoz Division achieved consolidated net sales of USD 9.6 billion, representing 20% of the Group's total net sales. Sandoz develops, manufactures and markets finished dosage form medicines as well as intermediary products including active pharmaceutical ingredients.

Sandoz is organized globally into three franchises: Retail Generics, Anti-Infectives and Biopharmaceuticals. In Retail Generics, Sandoz develops, manufactures and markets active ingredients and finished dosage forms of small-molecule pharmaceuticals to third parties across a broad range of therapeutic areas, as well as finished dosage form anti-infectives sold to third parties. In Anti-Infectives, Sandoz manufactures and supplies active pharmaceutical ingredients and intermediates – mainly antibiotics – for internal use by Retail Generics and for sale to third-party customers. In Biopharmaceuticals, Sandoz develops, manufactures and markets protein- or other biotechnology-based products, including biosimilars, and provides biotechnology manufacturing services to other companies.

The Sandoz strategic ambition is to be the world's leading and most valued generics company (including biosimilars). Our divisional strategy focuses on three areas: developing a broad and consistent pipeline of off-patent launches across key geographies and across a broad range of therapeutic areas; positioning Sandoz to be "first in" by having a strong pipeline with a focus on being first to market and "last out" by way of competitive costs and stable supply; and instilling a true "generic mindset," with a focus on priorities, simple and rapid decision-making, and focused resource allocation.

Sandoz is the global market leader in biosimilars, with a total of eight approved and marketed products, and a pipeline of over 15 molecules. In addition to internally developed projects, our biosimilar portfolio comprises publicly announced commercialization agreements with BioCon, Gan & Lee, EirGenix and Polpharma Biologics. Availability of our biosimilars varies by country.

Sandoz is also the global market leader in generic antibiotics. Its Kundl, Austria, manufacturing site is the hub of the last vertically integrated antibiotics production chain in Europe, which offers certain competitive advantages including added supply chain resilience.

On January 31, 2020, we closed the previously announced acquisition of the Japanese business of Aspen Global Incorporated, consisting of off-patent branded medicines with a focus on anesthetics and specialty brands.

We received a CRL from the FDA in 2018 for our submission for a generic form of fluticasone propionate and salmeterol inhalation powder, for oral inhalation (GSK's Advair®). In January 2020, we decided to discontinue the generic Advair® development program in the US, following a detailed review of the latest data read-outs.

On March 2, 2020, we announced a resolution with the US Department of Justice (DOJ) Antitrust Division concerning the DOJ's antitrust investigation into the US generic drug industry. For more information, see "Item 18. Financial Statements—Note 20. Provisions and other non-current liabilities."

In 2018, Novartis announced an agreement to sell selected portions of its Sandoz US portfolio, specifically the Sandoz US dermatology business and generic US oral solids portfolio, to Aurobindo Pharma USA Inc., for USD 0.8 billion in cash and potential earn-outs. On April 2, 2020, Novartis announced the mutual agreement with Aurobindo to terminate the sale agreement, as approval from the US Federal Trade Commission for the transaction was not obtained within anticipated timelines. Sandoz continues to operate its oral solids and dermatology businesses as well as its dermatology development center as part of the Sandoz US business.

On July 27, 2020, Sandoz and the Austrian government announced a planned combined investment of more than EUR 150 million to enhance the long-term competitiveness and supply resilience of European production for key antibiotics.

Key marketed products

The Sandoz global portfolio covers a wide range of therapeutic areas. The following are some of the Sandoz key marketed products in each of its franchises (availability varies by market):

Retail Generics

Product	Originator drug	Description
Amoxicillin/clavulanic acid	Augmentin®	Antibiotic
Zoledronic acid	*Aclasta*	Osteoporosis treatment
Acetylcysteine	Various	Mucolytic agent
Tacrolimus	Various	Immunosuppressive agent

Anti-Infectives

Active ingredients	Description
Oral and sterile penicillins	Anti-infectives
Oral and sterile cephalosporins	Anti-infectives
Clavulanic acid and mixtures with clavulanic acid	ß-lactam inhibitors
Classical and semisynthetic macrolides	Anti-infectives

Intermediates	Description
Various cephalosporin intermediates	Anti-infectives
Macrolide base intermediates	Anti-infectives
Various crude compounds produced by fermentation	Cyclosporine, ascomycin, rapamycin, mycophenolic acid, etc.

Biopharmaceuticals

Product	Originator drug	Description
Omnitrope	Genotropin®	Recombinant human growth hormone to treat growth disorders and growth hormone deficiency
Binocrit and Epoetin alfa *Hexal*	Eprex®/Erypo®	Recombinant protein (erythropoiesis-stimulating) agent to treat anemia
Zarzio, Zarxio and *Filgrastim Hexal*	Neupogen®	Recombinant protein (granulocyte colony-stimulating factor (GCSF), short-acting) used in oncology
Glatopa	Copaxone®	Treatment for relapsing forms of multiple sclerosis (MS)
Erelzi [1]	Enbrel®	Fusion protein (TNF-α receptor) to treat multiple immune-mediated inflammatory diseases
Rixathon	MabThera®	Chimeric monoclonal antibody (directed against CD20 protein on B-cells) to treat blood cancers and immunological diseases
Hyrimoz	Humira®	Monoclonal antibody (TNF-α antibody) to treat multiple immune-mediated inflammatory diseases
Zessly	Remicade®	Monoclonal antibody (TNF-α antibody) to treat multiple immune-mediated inflammatory diseases
Ziextenzo	Neulasta®	PEGylated form of a recombinant human granulocyte colony-stimulating factor (GCSF) (long-acting) to reduce duration of chemotherapy-induced neutropenia and incidence of chemotherapy-induced febrile neutropenia

[1] Approved in the US in 2016. Launch in the US pending final resolution of litigation with Amgen, which markets Enbrel®. The US District Court of New Jersey ruled against Sandoz in August 2019, which was upheld on appeal; Sandoz is now considering its further appeal options.

Selected development projects – Biosimilars in Phase III development and registration

The following table describes Sandoz biosimilar projects that are in Phase III clinical trials (including filing preparation) and registration:

Project/ product	Common name	Mechanism of action	Potential indication/indications	Therapeutic areas	Route of administration	Current phase
GP2017	adalimumab	TNF-α antibody	Arthritides (rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis), plaque psoriasis and others (same as originator)	Immunology	Subcutaneous	EU approved US approved[1]
GP2411 [2]	denosumab	Anti-RANKL monoclonal antibody	Osteoporosis, treatment-induced bone loss, metastases to bone, giant cell tumor (indications vary in US and EU)	Endocrinology, Neurology	Subcutaneous	Phase III
EGI014A1 [3]	trastuzumab	Anti-HER2 recombinat IgG1, humanized monoclonal antibody	Breast and gastric tumors	Oncology	Intravenous	Phase III
DST356A1 [4]	natalizumab	Anti-α4 integrin monoclonal antibody	Monotherapy for relapsing-remitting forms of multiple sclerosis (RRMS); in US, second-line treatment for active Crohn's disease	Neurology, Immunology (US only)	Intravenous	Phase III

[1] Launched as *Hyrimoz* in the EU in October 2018. Also in October 2018, we announced a global resolution of all intellectual property-related litigation with AbbVie concerning adalimumab. Under the terms of the agreement, AbbVie grants us a non-exclusive license to AbbVie's intellectual property relating to Humira®, beginning on certain dates in certain countries in which AbbVie has intellectual property. We are not entitled to launch *Hyrimoz* in the US until the second half of 2023.
[2] Development in collaboration with Hexal AG.
[3] Development in collaboration with EirGenix, Inc.
[4] Development in collaboration with Polpharma Biologics.

Principal markets

The two largest generics markets in the world – the US and Europe – are the principal markets for Sandoz. The following table sets forth the aggregate 2020 net sales of Sandoz by region:

Sandoz

	2020 net sales to third parties	
	USD millions	%
Europe	5 231	54
United States	2 142	22
Asia, Africa, Australasia	1 501	16
Canada and Latin America	772	8
Total	**9 646**	**100**
Of which in Established Markets [1]	7 089	73
Of which in Emerging Growth Markets [1]	2 557	27

[1] Emerging Growth Markets comprise all markets other than the Established Markets of the US, Canada, Western Europe, Japan, Australia and New Zealand.

Many Sandoz products are used for chronic conditions that require patients to consume the product over long periods of time, from months to years. Sales of our anti-infective products and over-the-counter cough and cold products are subject to seasonal variation. Sales of the vast majority of our other products are not subject to material changes in seasonal demand.

Production

For information on the production of our products, see "—Item 4.B Business overview—Innovative Medicines—Production."

In September 2020, as part of a broader reorganization of Novartis Technical Operations (NTO), we established the Sandoz Technical Operations (STO) platform within NTO. STO will focus on producing generic medicines for Sandoz, as well as related external supply operations and supply chain.

Due to impurities found in the active ingredient batches sourced from third-party manufacturers, we recalled Sandoz valsartan, losartan and irbesartan products in the second half of 2018 and first quarter of 2019, and ranitidine film-coated tablets in the second half of 2019, from several markets, in line with our quality standards for all of our marketed products. The discovery of nitrosamines in some types of drug products led several health regulators (e.g., EMA, FDA and others) to conduct a detailed analysis of these impurities in affected medicinal products. Novartis works with health authorities around the world to continuously review all chemical and biological human medicines for the possible presence of nitrosamines. The EMA, FDA and other health authorities have provided guidance to the pharmaceutical industry to prevent unacceptable levels of nitrosamines in medicines. The EMA review is due to conclude in March 2021 for chemical human medicines and in July 2021 for biological human medicines.

Marketing and sales

Sandoz sells a broad portfolio of products, including the products of our Retail Generics franchise and biosimilars, to wholesalers, pharmacies, hospitals and other healthcare outlets. Sandoz adapts its marketing and sales approach to local decision-making processes, depending on the structure of the market in each country.

In response to rising healthcare costs, many governments and private medical care providers, such as health maintenance organizations, have instituted reimbursement schemes that favor the substitution of bioequivalent generic versions of originator pharmaceutical products, such as those sold by our Retail Generics franchise. In the US, statutes have been enacted by all states that permit or require pharmacists to substitute a less expensive generic product for the brand-name version of a drug that has been prescribed to a patient. Generic use is growing in Europe, but penetration rates in many EU countries (as a percentage of volume) remain well below those in the US.

Recent trends have been toward continued consolidation among distributors and retailers of Sandoz products, both in the US and internationally, which has increased our customers' purchasing leverage.

Legislative or regulatory changes can have a significant impact on our business in a country. For more information on such changes, see ""—Item 4.B Business overview—Innovative Medicines—Price controls."

Our Anti-Infectives franchise supplies active pharmaceutical ingredients and intermediates – mainly antibiotics – for internal use by Retail Generics and for sale to the pharmaceutical industry worldwide.

Our Biopharmaceuticals franchise operates in an emerging business environment, particularly in the US. Regulatory pathways for approving biosimilar products are either relatively new or still in development, and policies have not yet been fully defined or implemented regarding the automatic substitution and reimbursement of biosimilars in many markets, including the US. As a result, in many of these markets, our biosimilar products are marketed as branded competitors to the originator products.

Competition

The market for generic products is characterized by increasing demand for high-quality pharmaceuticals that can be marketed at lower costs due to comparatively minimal initial research and development investments. Increasing pressure on healthcare expenditure and numerous patent and data exclusivity period expirations have encouraged more generic product launches, resulting in increased competition among the companies selling generic pharmaceutical products, leading to ongoing price pressure. In particular, Sandoz faces increased industrywide pressure on prices for generic products, particularly in the US, driven by factors including customer consolidation and growing competition from other manufacturers of generic medicines. These factors contributed to a decline in US sales that began in 2017 and continued through 2020.

In addition, research-based pharmaceutical companies are participating directly in the generic conversion process by licensing their patented products to generic companies (so-called "authorized generics"). Consequently, generic companies that were not otherwise in a position to launch a specific product may participate in the market using the innovator's product authorization. Authorized generics serve as a business opportunity for Sandoz when the product of a research-based pharmaceutical company loses patent protection and Sandoz secures a license from the research-based pharmaceutical company to launch the authorized generic of that product.

Development and registration

Development of Sandoz Biopharmaceuticals is jointly overseen by Sandoz and by Global Drug Development (GDD) and is mostly executed by GDD. Development and registration activities for Retail Generics products, and certain registration activities for Biopharmaceuticals products, continue to be overseen directly by Sandoz.

Before a generic pharmaceutical may be marketed, intensive technical and clinical development work must be performed to demonstrate, in bioavailability studies, the bioequivalence of the generic product to the reference product. Nevertheless, research and development costs associated with generic pharmaceuticals are much lower than those of the originator pharmaceuticals, as no preclinical studies or clinical trials on dose finding, safety and efficacy must be performed by the generic company. As a result, generic pharmaceutical products can be offered for sale at prices often much lower than those of products protected by patents and data exclusivity, which must recoup substantial research and development costs through higher prices over the life of the product's patent and data exclusivity period.

While generic pharmaceuticals are follow-on versions of chemically synthesized molecules, biosimilar products contain a version of the active substance of an already approved biological reference medicine. Due to the inherent variability and complexity of biologic products, including batch-to-batch differences and variations following manufacturing changes, the development and the regulatory pathway of biosimilars differ significantly from that of generics.

The development of a biosimilar product is much more technically challenging than the development of a typical generic small-molecule pharmaceutical. While generic pharmaceuticals normally do not require clinical studies in patients, regulators worldwide do require such targeted studies for biosimilar products. Biosimilars are engineered to match the reference medicine in quality, safety and efficacy. This is achieved by systematically defining the target range of the reference medicine and then comparing the biosimilar to the reference medicine at various development stages to confirm biosimilarity and to establish that there are no clinically meaningful differences between the proposed biosimilar and the reference biologic. Because the purpose of a biosimilar clinical development program is to confirm biosimilarity and not to establish efficacy and safety de novo, the clinical studies required are less than those required for a reference biologic. Therefore, the cost of development for a biosimilar is usually less than that of a reference biologic.

The Development and Registration staff employed by affiliates of the Sandoz Division are based worldwide, including at facilities in Holzkirchen, Germany; Hyderabad, India; Kundl, Austria; Ljubljana, Slovenia; and Rudolstadt, Germany. In November 2020, Sandoz completed (i) the previously announced closure of the Holzkirchen, Germany, development and registration site, with the exception of patch development and the project management group, and; (ii) the closure of the product development and registration site as well as the maintenance and development regulatory centers in Unterach, Austria. We are conducting a review of our global development and regulatory network to consolidate and streamline operations and optimize our network structure to enable Sandoz to compete sustainably in an increasingly challenging generics environment. As part of this review, in the fourth quarter of 2020, Sandoz announced the planned closure of its maintenance regulatory center in Barleben, Germany, which we expect will be completed in the fourth quarter of 2021. Sandoz also announced the planned closure of the Fougera development center located in Melville, New York as well as the product development center in Boucherville, Canada, which we expect will be completed in 2021.

Regulation

Generics

The Hatch-Waxman Act in the US (and similar legislation in the EU and in other countries) eliminated the requirement that manufacturers of generic pharmaceuticals repeat the extensive clinical trials required for reference products, so long as the generic version could be shown to be therapeutically equivalent to the reference product.

In the US, the decision on whether a generic pharmaceutical is therapeutically equivalent to the original product is made by the FDA based on an Abbreviated New Drug Application (ANDA) filed by the generic product's manufacturer. The process typically takes nearly two years from the filing of the ANDA until FDA approval.

However, delays can occur if issues arise, for example, regarding the interpretation of bioequivalence study data, labeling requirements for the generic product, or qualifying the supply of active ingredients. In addition, the Hatch-Waxman Act requires a generic manufacturer to certify in certain situations that the generic product does not infringe on any current applicable patents on the product held by the holder of the marketing authorization for the reference product, or to certify that such patents are invalid. This certification often results in a patent infringement lawsuit being brought against the generic company. In the event of such a lawsuit, the Hatch-Waxman Act imposes an automatic 30-month delay in the approval of the ANDA to allow the parties to resolve the intellectual property issues. For generic applicants who are the first to file their ANDA containing a certification claiming non-infringement or patent invalidity, the Hatch-Waxman Act generally provides those applicants with 180 days of marketing exclusivity to recoup the expense of challenging the patents on the reference product. However, generic applicants must launch their products within certain timeframes or risk losing the marketing exclusivity that they had gained by being a first-to-file applicant.

In the EU, decisions on the granting of a marketing authorization are made either by the European Commission based on a positive recommendation by the EMA under the centralized procedure, or by a single member state under the national or decentralized procedure. See "—Innovative Medicines—Regulation—European Union." Companies may submit Abridged Applications for approval of a generic medicinal product based upon its "essential similarity" to a medicinal product authorized and marketed in the EU following the expiration of the product's data exclusivity period. In such cases, the generic company is able to submit its Abridged Application based on the data submitted by the innovator company for the reference product, without the need to conduct extensive Phase III clinical trials of its own. For all products that received a marketing authorization in the EU after late 2005, the Abridged Application can be submitted throughout the EU. However, the data submitted by the innovator company in support of its application for a marketing authorization for the reference product will be protected for 10 years after the first grant of marketing authorization in all member states, and can be extended for an additional year if a further innovative indication has been authorized for that product, based on preclinical and clinical trials filed by the innovator company that show a significant clinical benefit in comparison to the existing therapies.

Biosimilars

The regulatory pathways for approval of biosimilar medicines are still being developed and established in many countries of the world. A regulatory framework for the approval of biosimilars has been established in the EU, Japan, Canada and the US, while the World Health Organization (WHO) has issued guidance. Sandoz has successfully registered and launched the first biosimilar (or biosimilar-type) medicine in Europe, the US, Canada, Japan, Taiwan, Australia, and many countries in Latin America and Asia. Sandoz was the first company to secure approval for and launch a biosimilar under the US biosimilar pathway that was established as part of the Biologics Price Competition and Innovation Act (BPCIA).

The approval of biosimilars in Europe follows a process similar to that followed for small molecules. However, biosimilars usually have to be approved through the centralized procedure because they are manufactured using recombinant DNA technology. As part of the approval process in the EU, biosimilars have to demonstrate comparability to the reference medicine in terms of safety, efficacy and quality through an extensive comparability exercise, based on strict guidelines set by the authorities. Regulators will only approve a biosimilar based on data that allows the regulators to conclude that there are no clinically meaningful differences between the reference medicine and the biosimilar.

In the US, under the BPCIA, a biosimilar must be highly similar with no clinically meaningful differences compared to the reference medicine. Approval of a biosimilar in the US requires the submission of an ABLA to the FDA, including an assessment of immunogenicity, and pharmacokinetics or pharmacodynamics. The ABLA for a biosimilar can be submitted as soon as four years after the initial approval of the reference biologic, but can only be approved 12 years after the initial approval of the reference biologic.

Intellectual property

We take all reasonable steps to ensure that our products do not infringe valid intellectual property rights held by others. Nevertheless, competing companies commonly assert patent and other intellectual property rights. As a result, we can become involved in significant litigation regarding our products. If we are unsuccessful in defending these suits, we could be subject to injunctions preventing us from selling our products and to potentially substantial damages.

Wherever possible, our products are protected by our own patents. Among other things, patents may cover the products themselves, including the product's formulation, or the processes for manufacturing a product. However, there can be no assurance that our intellectual property will protect our products or that we will be able to avoid adverse effects from the loss of intellectual property protection in the future.

4.C Organizational structure

Organizational structure

See "Item 4. Information on the Company—Item 4.A History and development of Novartis" and "Item 4. Information on the Company—Item 4.B Business overview—Overview."

Significant subsidiaries

See "Item 18. Financial Statements—Note 32. Principal Group subsidiaries and associated companies."

4.D Property, plants and equipment

Our principal executive offices are located in Basel, Switzerland. Our divisions operate through a number of affiliates that have offices, research and development facilities, and production sites throughout the world.

We generally own our facilities or have entered into long-term lease arrangements for them. Some of our principal facilities are subject to mortgages and other security interests granted to secure certain debts.

Novartis Technical Operations (NTO) manages the production, supply chains and quality of our Innovative Medicines and Sandoz Division products through a network of 54 manufacturing sites, as well as through external suppliers, and warehouse and distribution centers. In addition, our Innovative Medicines Division manages six AAA sites for radioligand therapies production and six sites for Novartis Gene Therapies (formerly AveXis) for research and development, production, warehousing and administrative offices. Endocyte manages two sites for research and its headquarters and administrative offices.

The following table sets forth our major headquarters and most significant production, research and development, and administrative facilities. See also "—Item 4.B Business overview—Innovative Medicines—Production" and "—Item 4.B Business overview—Sandoz—Production" for a discussion of our manufacturing processes.

Major facilities

Location	Size of site (in square meters)	Major activity
Basel, Switzerland – St. Johann	589 000	Global Group headquarters; global Innovative Medicines Division headquarters; Global Sandoz Division headquarters; research and development; production of drug substances and drug intermediates
Kundl and Schaftenau, Austria	480 000	Production of biotechnological products, drug products and finished products, anti-infectives, active drug substances, product development
East Hanover, New Jersey	391 000	Innovative Medicines Division US headquarters, research and development
Barleben, Germany	340 000	Production of broad range of generics finished dosage forms
Cambridge, Massachusetts	201 800	Research and development
Shanghai, China	106 500	Research and development
Stein, Switzerland	64 700	Production of sterile vials, pre-filled syringes and ampoules; inhalation capsules, tablets and transdermals; active pharmaceutical ingredients, and cell and gene therapies
Holzkirchen, Germany	64 200	Global Sandoz Division, production of oral films, transdermal delivery systems, matrix patches, product development
Huningue, France	35 000	Production of drug substances for clinical and commercial supply
Princeton, New Jersey	14 300	Sandoz Division US headquarters
Libertyville, Illinois	9 800	Production, warehouse and administrative offices for the Novartis Gene Therapies unit within the Innovative Medicines Division

As our product portfolio evolves, NTO is adapting our manufacturing capacity and capabilities to meet our changing needs, shifting from high-volume products toward lower-volume, customized and personalized medicines. As of December 31, 2020, we have closed, exited or sold 18 manufacturing sites since 2016 and have announced the closure, exit or sale of seven additional manufacturing sites. We have continued to expand our capacity in personalized medicines and complex biologic drugs, such as in Stein, Switzerland, as well as investing in new facilities to provide cell and gene therapies, such as in Les Ulis, France. We are leveraging innovation to increase the reliability and productivity of our manufacturing network, including using data and digital technologies. We continue to seek opportunities to manage our production facilities as efficiently as possible, optimize

external spend, and simplify and standardize across our manufacturing network to help us lower costs and help optimize the value of our products. At the same time, we are working to improve our environmental sustainability, for example by reducing energy and water consumption at our sites.

For a description of the impact of environmental matters, see "Item 3. Key Information—Item 3.D Risk factors—Environmental, social and governance—Unsuccessful management of environmental, social and governance matters," "Item 3. Key Information—Item 3.D Risk factors—Environmental matters—Impact of environmental liabilities," and "Item 3. Key Information—Item 3.D Risk factors—Climate change—Climate change and associated increased risk of major natural disasters." See also "Item 18. Financial Statements—Note 20. Provisions and other non-current liabilities."

Item 4A. Unresolved Staff Comments

Not applicable.

Item 5. Operating and Financial Review and Prospects

5.A Operating results

This operating and financial review should be read with the Group's consolidated financial statements in this Annual Report, which have been prepared in accordance with International Financial Reporting Standards (IFRS) as published by the International Accounting Standards Board (see "Item 18. Financial Statements"). "Item 5. Operating and Financial Review and Prospects" with the sections on compounds in development and selected development projects of our divisions (see "Item 4. Information on the Company—Item 4.B Business overview") constitute the Operating and Financial Review (*Lagebericht*), as defined by the Swiss Code of Obligations.

The discussion and analysis of the financial condition and results of operations of certain items from fiscal year ended December 31, 2018 and year to year comparison between fiscal year ended December 31, 2019 and December 31, 2018 that are not included in this Form 20-F can be found in "Item 5. Operating and Financial Review and Prospects" of our Form 20-F for the fiscal year ended December 31, 2019, which is incorporated by reference herein.

Overview

Our purpose is to reimagine medicine to improve and extend people's lives. We use innovative science and technology to address some of society's most challenging healthcare issues. We discover and develop breakthrough treatments and find new ways to deliver them to as many people as possible. We also aim to reward those who invest their money, time and ideas in our Company. Our vision is to become the most valued and trusted medicines company in the world.

The businesses of Novartis are divided operationally on a worldwide basis into two identified reporting segments:

- Innovative Medicines: innovative patent-protected prescription medicines
- Sandoz: generic pharmaceuticals and biosimilars

In addition, we separately report the results of Corporate activities. The financial results of our Corporate activities include the costs of the Group headquarters and those of corporate coordination functions in major countries. Corporate also includes other items of income and expense that are not attributable to specific segments, such as certain revenues from intellectual property rights and certain expenses related to post-employment benefits, environmental remediation liabilities, charitable activities, donations and sponsorships.

Our divisions are supported by the following organizational units: the Novartis Institutes for BioMedical Research, Global Drug Development, Novartis Technical Operations and Novartis Business Services. The financial results of these organizational units are included in the results of the divisions for which their work is performed.

Significant transactions are discussed in "Item 18. Financial Statements—Note 2. Significant transactions", "Item 18. Financial Statements—Note 3. Segmentation of key figures 2020, 2019 and 2018," and "Item 18. Financial Statements—Note 30. Discontinued operations."

Following the February 28, 2019, shareholders' approval of the spin-off of the Alcon business, the Group reported its consolidated financial statements as "continuing operations" and "discontinued operations" for the current and prior years to comply with IFRS. Continuing operations include the businesses of the Innovative Medicines and Sandoz Divisions, and the continuing Corporate activities. Discontinued operations include the Alcon eye care devices business and certain Corporate activities attributable to the Alcon business prior to the spin-off, the gain on distribution of Alcon Inc. to Novartis AG shareholders and certain other expenses related to the spin-off. See "Item 18. Financial Statements—Note 1. Significant Accounting Policies", "Item 18. Financial Statements—Note 2. Significant Transactions" and "Item 18. Financial Statements—Note 30. Discontinued operations."

Our environment

We live in an era of amazing medical innovation, driven by better understanding of the genetic and biological roots of disease, and surging use of data analytics and digital technology in science and healthcare. At the same time, the world's population continues to grow and people are living longer, fueling a rise in chronic diseases. Together, these factors are increasing demand for high-quality care worldwide and pressuring healthcare systems to restrain spending growth.

Our strategy

Our strategy is to build a leading, focused medicines company powered by advanced therapy platforms and data science. As we implement our strategy, we have five priorities to shape our future and help us continue to create value for our company, our shareholders and society:

- *Unleash the power of people*. We believe that culture is fundamental to driving our performance and value for stakeholders. We are implementing this priority by building one consistent organizational culture that is inspired, curious and unbossed. Engagement of our associates is now at an all-time high. Externally, more than half of our candidates reference culture as one of the reasons to join Novartis. In the future, we expect to make real-time insights on company culture available

to our leaders to drive our performance and further foster our culture.

- *Deliver transformative innovation*. We prioritize first-in-class medicines in our pipeline to address the needs of patients with no or limited treatment options. Our commitment is to go beyond traditional modalities (for example, small molecules and biologics) and invest in advanced therapy platforms (for example, cell therapy, gene therapy, radioligand therapy and RNA-based therapeutics). Novartis has a leading pipeline based on scale, innovation and future value, including 118 assets in Phase I or II, 49 in Phase III or undergoing registration and more than 65 new molecular entities as of December 31, 2020. The pipeline is expected to fuel growth in the mid-to long-term, with around 90% potential first-in-class/first-in-indication medicines and about 80% of targets in areas of high unmet patient need. The company is strengthening its advanced therapy platforms along the value chain with 20 advanced platform therapies in clinical development alongside a large number of pre-clinical projects. We are also making significant progress on the manufacturing and commercialization of these advanced therapy platforms.
- *Embrace operational excellence*. We believe that operational excellence is becoming an increasingly important factor to the success of our business. We are focused on three key areas: (i) Launch excellence and the performance of our growth drivers. We are reinforcing our approach to product launches to become more consistent across markets. To ensure we deploy our resources effectively, we are investing in earlier pre-launch preparations, including talking with doctors, patients and insurers to better understand their needs. Using data science, we are expanding our ability to test and learn from new commercial models and employ real-time analysis of marketing data in order to target customers with personalized content, orchestrated across multiple marketing channels; (ii) Transformation of NTO to deliver consistent productivity gains together with high levels of quality and service. We are consolidating our manufacturing footprint to achieve better asset utilization and increased focus on making medicines. At the same time, we are investing in innovative technologies and advanced therapy platforms, while supporting launches and growth drivers through dedicated product management teams. NTO is digitizing its key processes and leveraging data to establish next-generation manufacturing capabilities. Our resilient supply network has helped us to respond to the COVID-19 pandemic, supporting an uninterrupted supply of our medicines; and (iii) NBS continuing on its journey to become an industry-leading enterprise transformation engine. We are strengthening our Global Service Centers, while building strong IT and digital foundations, realizing significant procurement efficiencies, and driving simplification of key enterprise processes.
- *Go big on data and digital*. We believe that the growth and implementation of digital technologies in our industry, including for research and development, production, marketing and sales, and as a component of our products is an important trend in our industry. Our digital ambition is to transform how we innovate, how we engage with customers and how we operate. We plan to achieve this by focusing on four areas: (i) Scale our digital foundational programs designed to jumpstart our digital transformation in key areas of our business; (ii) Make Novartis digital by working to build up our talent, infrastructure and ways of working to enable us to work more efficiently with data and to improve the quality of that data; (iii) Become the healthcare partner of choice in the tech ecosystem by transforming how we work with all of our partners – from nimble start-ups and innovative academic institutions to some of the biggest organizations in the industry. We have created the Novartis Biome as a bridge to help our partners become more like an extension of our own teams and to work with us as easily and productively as possible; and (iv) We are preparing for potential future disruptive healthcare scenarios such as AI-based digital disease management.
- *Build trust with society*. Building trust with society has become an important requirement for companies like Novartis. Stakeholders are increasingly expressing preference for companies with clear ESG plans, and some institutional investors increasingly believe there is a correlation between company valuations and ESG performance. We focus on four strategic pillars defined as material by strategic stakeholders: (i) Ethical standards: In 2020, we focused our activities on operational excellence including the launch of a new Code of Ethics and strengthening our third-party risk management framework; (ii) Pricing and Access: We continue to systematically integrate access strategies into the research, development and delivery of our medicines globally, including in low and middle-income countries. In 2020, we issued the first healthcare industry sustainability-linked bond which was also the first sustainability-linked bond incorporating social targets tied to targets for expanding access to our innovative medicines and addressing key global health challenges, two areas where we believe we can drive the greatest value for society; (iii) Global Health Challenges: We continue to expand our global health programs in malaria, leprosy, Chagas disease, and sickle-cell-disease, and in 2020 launched our new Sub-Saharan-Africa strategy with our Sub-Saharan-Africa unit deploying innovative approaches to increase patient reach across countries regardless of income level; and (iv) Corporate Citizenship: We aim at achieving gender balance in management and fulfill our UN pay equity and transparency pledge by 2023. We also aim to achieve full carbon, plastic and water neutrality by 2030. Beyond our four strategic pillars, we continue our efforts to strengthen our governance and increase transparency. In 2020, we created an ESG Management Office within Corporate Strategy tasked with improving oversight, and facilitating embedding ESG measures into our business operations. Further, we have created an ESG Index to allow ESG analysts to more easily locate our ESG disclosures across our public disclosures and channels.

Results of operations

Financial year 2020 compared to 2019

Key figures[1]

(USD millions unless indicated otherwise)	**Year ended Dec 31, 2020**	Year ended Dec 31, 2019	Change in USD %	Change in constant currencies %[2]
Net sales to third parties from continuing operations	**48 659**	**47 445**	**3**	**3**
Sales to discontinued operations		53	nm	nm
Net sales from continuing operations	**48 659**	**47 498**	**2**	**3**
Other revenues	1 239	1 179	5	5
Cost of goods sold	– 15 121	– 14 425	– 5	– 3
Gross profit from continuing operations	**34 777**	**34 252**	**2**	**3**
Selling, general and administration	– 14 197	– 14 369	1	1
Research and development	– 8 980	– 9 402	4	6
Other income	1 742	2 031	– 14	– 17
Other expense	– 3 190	– 3 426	7	9
Operating income from continuing operations	**10 152**	**9 086**	**12**	**19**
% of net sales to third parties	20.9	19.2		
Income from associated companies	673	659	2	2
Interest expense	– 869	– 850	– 2	– 4
Other financial income and expense	– 78	45	nm	nm
Income before taxes from continuing operations	**9 878**	**8 940**	**10**	**17**
Taxes	– 1 807	– 1 793	– 1	– 7
Net income from continuing operations	**8 071**	**7 147**	**13**	**20**
Net loss from discontinued operations before gain on distribution of Alcon Inc. to Novartis AG shareholders		– 101	nm	nm
Gain on distribution of Alcon Inc. to Novartis AG shareholders		4 691	nm	nm
Net income from discontinued operations		**4 590**	**nm**	**nm**
Net income	**8 071**	**11 737**	**– 31**	**– 27**
Attributable to:				
Shareholders of Novartis AG	*8 072*	*11 732*	*– 31*	*– 27*
Non-controlling interests	*– 1*	*5*	*nm*	*nm*
Basic earnings per share from continuing operations (USD)	**3.55**	**3.12**	**14**	**21**
Basic earnings per share from discontinued operations (USD)		2.00	nm	nm
Total basic earnings per share (USD)	**3.55**	**5.12**	**– 31**	**– 26**
Net cash flows from operating activities from continuing operations	**13 650**	**13 547**	**1**	
Free cash flow from continuing operations[2]	**11 691**	**12 937**	**– 10**	

[1] Continuing operations include the businesses of the Innovative Medicines and Sandoz Divisions and the continuing Corporate activities and discontinued operations include the Alcon eye care devices business and certain Corporate activities attributable to the Alcon business prior to the spin-off, the gain on distribution of Alcon Inc. to Novartis AG shareholders in 2019 and certain other expenses related to the distribution. See "Item 18. Financial Statements—Note 1. Significant accounting policies", "Item 18. Financial Statements—Note 2. Significant transactions—Significant transactions in 2019," and "Item 18. Financial Statements—Note 30. Discontinued operations."

[2] For an explanation of non-IFRS measures and reconciliation tables, see "Item 5.A Operating results—Non-IFRS measures as defined by Novartis."

nm = not meaningful

Group overview

The COVID-19 situation continues to evolve and is taking differing courses across the multitude of geographies that Novartis operates in. We continue to take strong actions to help address the pandemic consequences. Our primary concerns remain the health and safety of our associates and patients.

During the year, there have been COVID-19 related lockdowns in several geographies negatively impacting certain therapeutic areas, most notably in: ophthalmology, dermatology and the Sandoz Retail Generics Business. However, our operations remain stable and cash collections continue to be according to our normal trade terms, with days sales outstanding at normal levels. Novartis remains well positioned to meet its ongoing financial obligations and has sufficient liquidity to support our normal business activities. At present, drug development operations are continuing with manageable disruptions, with our range of digital technologies allowing us to proactively manage our clinical trials portfolio and rapidly mitigate any disruptions (see the section on compounds in development and selected development projects of our divisions within "Item 4. Information on the Company – Item 4.B Business overview").

Novartis launched a first-of-its-kind not-for-profit portfolio of 15 medicines from the Sandoz Division for symptomatic treatment of COVID-19. The portfolio addresses urgent unmet needs and is sold at no profit to governments in up to 79 eligible low and lower middle income countries. We continue to work closely with third parties to fight the COVID-19 pandemic. Novartis is also undertaking drug discovery efforts to develop the first oral medicines for COVID-19 and other coronaviruses. We are investigating two potential medicines, DFV890 and MAS825, in early stage development focused on the immune response. In October, we announced a collaboration with Molecular Partners to develop, manufacture and commercialize Molecular Partners' anti-COVID-19 DARPin® program, potential medicines for the prevention and treatment of COVID-19.

In 2020, Novartis delivered sales growth, margin expansion, and continued to progress its next wave of medicines.

Net sales to third parties for Novartis continuing operations were USD 48.7 billion, up 3% in reported terms and up 3% measured in constant currencies (cc) to remove the impact of exchange rate movements. Sales growth was driven by volume growth of 9 percentage points, mainly driven by *Entresto, Zolgensma*, *Cosentyx, Ilaris* and the *Xiidra* acquisition for the Novartis Pharmaceuticals business unit and *Promacta/Revolade*, *Jakavi*, *Kisqali*, *Tafinlar + Mekinist* and *Piqray* for the Novartis Oncology business unit. The strong volume growth was partly offset by the negative impacts of pricing (3 percentage points) and generic competition (3 percentage points).

By division, Innovative Medicines delivered net sales of USD 39.0 billion (+3%, +4% cc). Sandoz net sales were USD 9.6 billion (–1%, 0% cc), impacted by ongoing disruptions to hospitals and HCP practices due to COVID-19, which limited patient access to treatments for our retail business across regions.

In Emerging Growth Markets, which comprise all markets excluding the US, Canada, Western Europe, Japan, Australia and New Zealand, sales from continuing operations were USD 11.9 billion (+1%, +6% cc) driven by China (USD 2.6 billion) growing 16%, (+16% cc).

Operating income from continuing operations was USD 10.2 billion (+12%, +19% cc), mainly driven by higher sales and productivity including lower spend. Operating income margin from continuing operations was 20.9% of net sales, increasing by 1.7 percentage point (+2.9 percentage points cc).

Net income from continuing operations was USD 8.1 billion (+13%, +20% cc) mainly driven by higher operating income. Earnings per share from continuing operations were USD 3.55 (+14%, +21% cc), growing faster than net income and benefiting from lower weighted average number of shares outstanding.

Net cash flows from operating activities from continuing operations amounted to USD 13.6 billion, compared to USD 13.5 billion in 2019. This increase was mainly driven by higher net income adjusted for non-cash items and other adjustments including divestment gains, partly offset by higher payments out of provisions related to legal matters.

Free cash flow from continuing operations amounted to USD 11.7 billion (–10%) compared to USD 12.9 billion in 2019, as higher operating income adjusted for non-cash items was more than offset by payments related to legal matters and lower divestment proceeds.

We also present our core results[1], which exclude the impact of amortization, impairments, disposals, acquisitions, restructurings and other significant items, to help investors understand our underlying performance.

Core operating income from continuing operations was USD 15.4 billion (+9%, +13% cc) driven by sales growth, lower spend and productivity. Core operating income margin was 31.7% of net sales, increasing by 2.0 percentage points (+2.8 percentage points cc).

Core net income from continuing operations was USD 13.2 billion (+9%, +12% cc) mainly driven by growth in core operating income. Core earnings per share from continuing operations were USD 5.78 (+9%, +13% cc), growing faster than core net income benefiting from lower weighted average number of shares outstanding.

In 2020, there were no operational activities related to discontinued operations. In 2019, discontinued operations net sales were USD 1.8 billion, operating income amounted to USD 71 million and net income from discontinued operations was USD 4.6 billion, including the non-taxable non-cash net gain on distribution of Alcon Inc. to Novartis AG shareholders which amounted to USD 4.7 billion.

For the total Group, net income amounted to USD 8.1 billion compared to USD 11.7 billion in the prior year, including the non-taxable non-cash net gain on distribution of Alcon Inc. which amounted to USD 4.7 billion. Basic earnings per share were USD 3.55 compared to USD 5.12 in prior year. Cash flow from operating activities for the total Group amounted to USD 13.6 billion and free cash flow to USD 11.7 billion.

[1] For an explanation of non-IFRS measures and reconciliation tables, see "Item 5.A Operating results—Non-IFRS measures as defined by Novartis."

Net sales by segment

The following table provides an overview of net sales to third parties by segment:

(USD millions)	Year ended Dec 31, 2020	Year ended Dec 31, 2019	Change in USD %	Change in constant currencies %
Innovative Medicines	39 013	37 714	3	4
Sandoz	9 646	9 731	– 1	0
Net sales to third parties from continuing operations	**48 659**	**47 445**	**3**	**3**

Innovative Medicines

The Innovative Medicines Division delivered net sales of USD 39.0 billion in 2020, up 3% in reported terms and 4% in constant currencies (cc). The Novartis Pharmaceuticals business unit delivered net sales of USD 24.3 billion in 2020, growing 4% (+5% cc), driven by *Entresto*, *Zolgensma*, *Cosentyx*, *Ilaris* and the *Xiidra* acquisition. Growth was partly offset by declines in *Gilenya,* and lower demand for *Lucentis* due to COVID-19. Other Ophthalmology products were also impacted by both COVID-19 and generic competition. The Novartis Oncology business unit delivered net sales of USD 14.7 billion, growing 2% (+3% cc), driven by *Promacta/ Revolade*, *Jakavi*, *Kisqali*, *Tafinlar + Mekinist* and *Piqray*, partially offset by generic competition for *Afinitor* and *Exjade*. Volume contributed 10 percentage points to sales growth. Pricing had a negative impact of 3 percentage points. Generic competition had a negative impact of 3 percentage points.

Regionally, US sales (USD 14.3 billion, +4%) delivered strong performance *of Entresto, Zolgensma* and *Cosentyx*. Europe sales (USD 13.5 billion, +5%, +4% cc) grew driven by *Entresto, Zolgensma, Jakavi, Kisqali* and *Kymriah*. Japan sales were USD 2.4 billion (0%, –3% cc) as growth was negatively impacted by the *Galvus* co-promotion agreement. Emerging Growth Markets sales grew 3% (+7% cc), led by double-digit growth in China, including the launches of *Cosentyx* and *Entresto*.

The following table provides an overview of net sales to third parties by business franchise in the Innovative Medicines Division:

(USD millions)	Year ended Dec 31, 2020	Year ended Dec 31, 2019	Change in USD %	Change in constant currencies %
Total Novartis Oncology business unit	**14 711**	**14 370**	**2**	**3**
Total Novartis Pharmaceuticals business unit	**24 302**	**23 344**	**4**	**5**
Immunology, Hepatology and Dermatology	4 868	4 222	15	16
Ophthalmology	4 410	4 776	– 8	– 8
Neuroscience	4 323	3 773	15	14
Cardiovascular, Renal and Metabolism	2 498	1 750	43	42
Respiratory	1 900	1 825	4	5
Established Medicines	6 303	6 998	– 10	– 8
Total Innovative Medicines	**39 013**	**37 714**	**3**	**4**

The following table provides the top 20 Innovative Medicines Division product net sales in 2020 as well as the change compared to 2019:

			US		Rest of world			Total		
Brands	**Business franchise**	**Indication**	USD m	% change USD/cc[2]	USD m	% change USD	% change cc[2]	USD m	% change USD	% change cc[2]
Cosentyx	Immunology, Hepatology and Dermatology	Psoriasis, ankylosing spondylitis, psoriatic arthritis and non-radiographic axial spondyloarthritis	2 516	13	1 479	11	12	**3 995**	**13**	**13**
Gilenya	Neuroscience	Relapsing multiple sclerosis	1 562	– 10	1 441	– 3	– 3	**3 003**	**– 7**	**– 7**
Entresto	Cardiovascular, Renal and Metabolism	Chronic heart failure	1 277	38	1 220	52	52	**2 497**	**45**	**44**
Tasigna	Oncology	Chronic myeloid leukemia	859	7	1 099	2	3	**1 958**	**4**	**5**
Lucentis	Ophthalmology	Age-related macular degeneration			1 933	– 7	– 8	**1 933**	**– 7**	**– 8**
Promacta/Revolade	Oncology	Immune thrombocytopenia (ITP), severe aplastic anemia (SAA)	833	21	905	25	26	**1 738**	**23**	**23**
Tafinlar + Mekinist	Oncology	BRAF V600+ metastatic and adjuvant melanoma; advanced non-small cell lung cancer (NSCLC)	569	18	973	14	15	**1 542**	**15**	**16**
Sandostatin	Oncology	Carcinoid tumors and acromegaly	837	– 5	602	– 14	– 13	**1 439**	**– 9**	**– 8**
Jakavi	Oncology	Myelofibrosis (MF), polycythemia vera (PV)			1 339	20	20	**1 339**	**20**	**20**
Xolair[1]	Respiratory	Severe zllergic zsthma (SAA), chronic spontaneous urticaria (CSU) and nasal polyps			1 251	7	8	**1 251**	**7**	**8**
Galvus Group	Established Medicines	Type 2 diabetes			1 199	– 8	– 5	**1 199**	**– 8**	**– 5**
Gleevec/Glivec	Oncology	Chronic myeloid leukemia and GIST	315	– 6	873	– 6	– 6	**1 188**	**– 6**	**– 6**
Afinitor/Votubia	Oncology	Breast cancer/TSC	644	– 36	439	– 18	– 17	**1 083**	**– 30**	**– 29**
Diovan Group	Established Medicines	Hypertension	124	44	879	– 10	– 8	**1 003**	**– 6**	**– 4**
Exforge Group	Established Medicines	Hypertension	16	23	964	– 5	– 3	**980**	**– 4**	**– 3**
Zolgensma	Neuroscience	Spinal muscular atrophy (SMA)	459	50	461	nm	nm	**920**	**155**	**151**
Ilaris	Immunology, Hepatology and Dermatology	Auto-inflammatory (CAPS, TRAPS, HIDS/MKD, FMF, SJIA, AOSD and gout)	400	32	473	29	30	**873**	**30**	**31**
Kisqali	Oncology	HR+/HER2- metastatic breast cancer	318	27	369	60	65	**687**	**43**	**45**
Exjade/Jadenu	Oncology	Chronic iron overload	138	– 69	515	– 2	– 2	**653**	**– 33**	**– 33**
Votrient	Oncology	Renal cell carcinoma	259	– 22	376	– 11	– 10	**635**	**– 16**	**– 15**
Top 20 products total			**11 126**	**3**	**18 790**	**6**	**7**	**29 916**	**5**	**5**
Rest of portfolio			3 216	8	5 881	– 5	– 5	**9 097**	**– 1**	**0**
Total division sales			**14 342**	**4**	**24 671**	**3**	**4**	**39 013**	**3**	**4**

[1] Net sales reflect *Xolair* sales for all indications.
[2] Constant currencies (cc) is a non-IFRS measure. For an explanation of non-IFRS measures, see " —Item 5.A Operating results—Non-IFRS measures as defined by Novartis."

For the table providing the top 20 Innovative Medicines Division product net sales in 2019, see "Item 18. Financial statements—Note 3. Segmentation of key figures 2020, 2019 and 2018."

For information about the approved indications for certain products described, see "Item 4. Information on the Company—Item 4.B Business overview—Innovative Medicines— Innovative Medicines Division products."

Novartis Oncology business unit

Tasigna (USD 2.0 billion, +4%, +5% cc) sales grew due to a strong performance in key markets including the US and China, partly offset by a decline in Europe.

Promacta/Revolade (USD 1.7 billion, +23%, +23% cc) grew across all regions, driven by increased use in chronic immune thrombocytopenia (ITP) and as first-line treatment for severe aplastic anemia (SAA) in the US.

Tafinlar + Mekinist (USD 1.5 billion, +15%, +16% cc), the worldwide leader in BRAF/MEK-inhibition, continued to deliver strong growth driven by demand in adjuvant melanoma, as well as advanced NSCLC. *Tafinlar +*

Mekinist is the first and only targeted therapy to achieve five-year relapse-free survival (RFS) and overall survival (OS) data in the adjuvant and metastatic melanoma settings, respectively.

Sandostatin (USD 1.4 billion, –9%, –8% cc) sales declined due to ongoing competitive pressure in Europe, US and Japan. The brand was also impacted by generic competition in Europe.

Jakavi (USD 1.3 billion, +20%, +20% cc) growth was driven by strong demand in the myelofibrosis and polycythemia vera indications. Data readouts from two Phase III studies (REACH2 and REACH3) showed *Jakavi* significantly improved outcomes in patients with steroid-resistant/dependent graft-versus-host disease (GvHD) compared to best available therapy. Regulatory filings based on the GvHD data are planned for 2021.

Gleevec/Glivec (USD 1.2 billion, –6%, –6% cc) declined due to increased generic competition.

Afinitor/Votubia (USD 1.1 billion, –30%, –29% cc) declined due to generic competition in the US, Europe and Emerging Growth Markets.

Kisqali (USD 687 million, +43%, +45% cc) continued strong growth across all geographies benefiting from the impact of positive overall survival (OS) data from two pivotal Phase III trials (MONALEESA-7 and MONALEESA-3). *Kisqali* stands apart as the only CDK4/6 inhibitor that significantly improves OS in two large Phase III trials, regardless of metastatic sites, endocrine treatment (ET) resistance, ET partner, treatment line or menopausal status, while maintaining quality of life.

Exjade/Jadenu (USD 653 million, –33%, –33% cc) declined mainly due to pressure from generic competition in the US and other regions.

Votrient (USD 635 million, –16%, –15% cc) declined due to increased competition in Europe and the US.

Kymriah (USD 474 million, +71%, +68% cc) grew strongly in Europe, US and Japan. Coverage continued to expand, with more than 280 qualified treatment centers and 27 countries having coverage for at least one indication. FDA granted Regenerative Medicine Advanced Therapy designation and orphan drug status for *Kymriah* in follicular lymphoma. At the interim analysis, the Phase II ELARA trial in patients with relapsed or refractory follicular lymphoma met its primary endpoint of complete response rate. Regulatory approvals in Switzerland, France and Japan expanded manufacturing capabilities for *Kymriah* to meet increased demand.

Lutathera (USD 445 million, +1%, +1% cc) sales were broadly in line with prior year, as the COVID-19 pandemic had an impact on the brand. There are 384 total centers now actively treating patients. Sales from all AAA brands (including *Lutathera* and radiopharmaceutical diagnostic products) were USD 681 million.

Piqray (USD 320 million, +176%, +176% cc) grew significantly in the US as the launch roll out continued. *Piqray* in combination with fulvestrant received European Commission (EC) approval to treat HR+/HER2- advanced breast cancer with a PIK3CA mutation. *Piqray* is the first and only therapy specifically developed for the approximately 40% of HR+/HER2- advanced breast cancer patients who have a PIK3CA mutation, which is associated with poor prognosis. *Piqray* is now approved in more than 50 countries, including the US and EU member states. *Piqray* launched in the US in June 2019.

Adakveo (USD 105 million) US launch continued to progress well, with more than 600 accounts purchasing *Adakveo* to date. Payer coverage decisions expanded, both in Medicaid and commercial (with 94% coverage among commercial plans to date). Following approval in Europe in Q4, reimbursement discussions with individual countries are underway.

Tabrecta (USD 35 million) US launch progressed well. Ninety leading lung cancer institutions have started patients on treatment. *Tabrecta* is the first and only therapy approved by the US FDA to specifically target metastatic NSCLC with a mutation that leads to MET exon 14 skipping (METex14), as detected by an FDA-approved test. *Tabrecta* also secured regulatory approval in Japan.

Novartis Pharmaceuticals business unit

Immunology, Hepatology and Dermatology

Sales in the Immunology, Hepatology and Dermatology franchise reached USD 4.9 billion (+15%, +16% cc), of which *Cosentyx* delivered USD 4.0 billion.

Cosentyx (USD 4.0 billion, +13%, +13% cc) saw continued growth across indications despite lower new patient starts across the market in dermatology and rheumatology in most geographies due to COVID-19. In the second quarter, *Cosentyx* received approval and launched in the EU and US for non-radiographic axial spondyloarthritis (nr-axSpA), its fourth major indication, and in August became the first treatment approved in Japan for this indication. In April, *Cosentyx* also became the first IL17A inhibitor approved in China for the treatment of AS. In July, *Cosentyx* received EU approval as a first-line systemic treatment for pediatric psoriasis. In November, *Cosentyx* received EC approval for a new 300 mg autoinjector and pre-filled syringe, which enable the 300 mg dose to be administered in a single injection. In China, *Cosentyx* has been listed in the National Reimbursement Drug List (NRDL) as the only interleukin inhibitor with planned execution March 1, 2021

Ilaris (USD 873 million, +30%, +31% cc) sales were driven by strong double-digit volume growth, particularly coming from the US, Europe and Japan. In June, *Ilaris* was granted a new indication in the US for active Still's disease including Adult-Onset Still's Disease (AOSD); this is in addition to its previously-granted indication for systemic juvenile idiopathic arthritis (SJIA). *Ilaris* is the first FDA-approved treatment for AOSD.

Ophthalmology

Sales in the Ophthalmology franchise were USD 4.4 billion (–8%, –8% cc) and were impacted by the COVID-19 pandemic.

Lucentis (USD 1.9 billion, –7%, –8% cc) sales declined due to the negative impact of the COVID-19 pandemic, which has significantly disrupted ophthalmology practices and limited patient access to treatment of retinal diseases. Sales have been consistently recovering from the COVID-19 impact since May until the end of the third quarter, and showed less impact of the pandemic in the fourth quarter compared to the second quarter.

Xiidra (USD 376 million, +96%, +95% cc) was impacted by COVID-19 pandemic as ophthalmology visits declined significantly. In the latter part of the second quarter, the US dry eye market began to rebound as eye care practices began opening. Novartis has informed the European Medicines Agency of its decision to withdraw the centralized application for Marketing Authorization of *Xiidra*. Novartis acquired *Xiidra* from Takeda and began recording sales as of July 1, 2019.

Beovu (USD 190 million) launch roll-out continued, with approval now in 57 countries. Post marketing case reports termed as "retinal vasculitis" and/or "retinal vascular occlusion" that may result in severe vision loss, typically associated with intraocular inflammation, and the COVID-19 pandemic had an unfavorable impact on sales. Novartis has a comprehensive plan, in strong collaboration with leading external global experts to educate the retina community about the positive benefit / risk profile of *Beovu*.

Other Ophthalmology products declined due to the negative impact of the COVID-19 pandemic and generic impacts in the US, primarily for *Travatan* and *Ciprodex*.

Neuroscience

Sales in the Neuroscience franchise were USD 4.3 billion (+15%, +14% cc), mainly driven by the sales growth of *Zolgensma*, partly offset by sales decline of *Gilenya*.

Gilenya (USD 3.0 billion, –7%, –7% cc) sales declined due to increased competition and the impact of the COVID-19 pandemic. *Gilenya* remains the top prescribed high efficacy therapy in 41 countries and the only one approved to treat pediatric RMS.

Zolgensma (USD 920 million, +155%, +151% cc) delivered significant growth despite the negative impact of the COVID-19 pandemic in the US and ex-US, with geographic expansion in Europe and Japan contributing strongly. Reimbursement is now secured in six countries, with access pathways in nine EU countries through our Day One Access initiative representing approximately 25% of the EU population. As anticipated, there was a shift from prevalent patients to incident patients in all markets post launch, with increased newborn screening in the US contributing to growth. *Zolgensma* recent approvals include Brazil, Israel, Canada and Taiwan. *Zolgensma* is viewed as an essential one-time treatment and is the only therapy for spinal muscular atrophy (SMA) that addresses the genetic root cause of SMA by replacing the function of the missing SMN1 gene. Its clinical profile and one-time dosing are anticipated to remain differentiators for both physicians and patients when making a treatment choice. *Zolgensma* launched in the US in June 2019.

Mayzent (USD 170 million) continued to grow steadily. Growth was driven by fulfilling an important unmet need in patients showing signs of progression despite being on other treatments. *Mayzent* is the first and only oral DMT studied and proven to delay disease progression in a broad SPMS patient population. In addition to the US and EU, *Mayzent* is now approved in the UK, Australia, Canada, Japan and Switzerland.

Aimovig (USD 164 million, ex-US, ex-Japan, +59%, +57% cc) is the most prescribed anti-CGRP worldwide, with more than half a million patients prescribed worldwide in the post-trial setting. *Aimovig* is co-commercialized with Amgen in the US, where Amgen records sales. Novartis has exclusive rights and records sales in all ex-US territories excluding Japan. During the ongoing litigation between the companies the collaboration continues and will remain in force until a final court decision.

Kesimpta (ofatumumab, formerly OMB157) (USD 15 million) was launched in the US following FDA approval in August. To initiate access, we are providing *Kesimpta* free of charge to US patients who are eligible for reimbursement until they are covered by their insurance. *Kesimpta* is a targeted B-cell therapy that can deliver sustained high efficacy, with a favorable safety profile and the flexibility of an at home self-administration for a broad population of RMS patients. We have seen a promising start with our flexible hybrid face-to-face / digital launch.

Cardiovascular, Renal and Metabolism

Sales in the Cardiovascular, Renal and Metabolism franchise were USD 2.5 billion (+43%, +42% cc).

Entresto (USD 2.5 billion, +45%, +44% cc) sustained strong growth with increased patient share across markets, driven by demand as the essential first choice therapy for HF patients (reduced ejection fraction). *Entresto* was successfully launched in Japan in August. FDA Cardiovascular and Renal Drugs Advisory Committee voted 12 to 1 to support the use of *Entresto* in treatment of patients with heart failure with preserved ejection fraction (HFpEF). Expected FDA approval has the potential to make *Entresto* the first therapy indicated for both HFpEF and HFrEF in the US, and a final decision is expected in the first quarter of 2021.

Respiratory

Sales in the Respiratory franchise were USD 1.9 billion (+4%, +5% cc), of which *Xolair* delivered USD 1.3 billion.

Xolair (USD 1.3 billion, +7%, +8% cc) continued growth in the severe allergic asthma (SAA) and chronic spontaneous urticaria (CSU) indications. In the first half 2020, *Xolair* received approval from the US and the European Commission (EC) for a new indication to treat severe chronic rhinosinusitis with nasal polyps (CRSwNP). Novartis co-promotes *Xolair* with Genentech in the US and shares a portion of operating income, but we do not record any US sales.

Ultibro Group (USD 623 million, –1%, –1% cc) sales were broadly in line with prior year, as strong *Ultibro Breezhaler* sales were offset by the decline in *Seebri Breezhaler* and *Onbrez Breezhaler*. *Ultibro* Group consists of inhaled COPD therapies *Ultibro Breezhaler*, *Seebri Breezhaler* and *Onbrez Breezhaler*.

Enerzair Group consists of *Enerzair Breezhaler* and *Atectura Breezhaler*. *Enerzair Breezhaler* (indacaterol / glycopyrronium bromide / mometasone, formerly known as QVM149) is an inhaled LABA/LAMA/ICS combination for patients whose asthma is uncontrolled with LABA/ICS. *Atectura Breezhaler* (indacaterol / mometasone, formerly known as QMF149) is a LABA/ICS fixed-dose combination for patients whose asthma is uncontrolled with SABA and ICS. Both medicines were approved in the EU, Japan, Canada, Australia, Switzerland and South Korea in 2020, together with the digital companion (sensor and app) for *Enerzair Breezhaler* in the EU and Switzerland. They have been launched to date in seven markets, including Germany, Japan and the UK.

Established Medicines

The Established Medicines franchise had sales of USD 6.3 billion (–10%, –8% cc).

Galvus Group (USD 1.2 billion, –8%, –5% cc) declined primarily due to generic competition in Emerging Growth Markets and pricing impact from our co-promotion agreement in Japan that started in 2019.

Diovan Group (USD 1.0 billion, –6%, –4% cc) declined mainly due to generic competition and the impact of VBP in China.

Exforge Group (USD 980 million, –4%, –3% cc) declined in Europe due to generic competition, partly offset by growth in China.

Zortress/Certican (USD 452 million, –7%, –7% cc) declined mainly due to generic competition in the US.

Neoral/Sandimmun(e) (USD 393 million, –6%, –6% cc) declined mainly due to generic competition and mandatory price reductions.

Voltaren/Cataflam (USD 360 million, –14%, –12% cc) declined mainly due to generic competition and external supply issues following the COVID-19 pandemic.

Sandoz

Net sales were USD 9.6 billion (–1%, 0% cc) with volume growth of 2 percentage points despite the COVID-19 impacts. There was a negative price effect of 2 percentage points, despite the benefit from off-contract sales and favorable revenue deduction adjustments.

Sales in Europe were USD 5.2 billion (+2%, +2% cc). Sales in the US were USD 2.1 billion (–14%), due to the continued volume decline in oral solids including partnership terminations. Sales in Asia / Africa / Australasia were USD 1.5 billion (+12%, +11% cc) including the contribution from the Aspen Japan acquisition. Sales in Canada and Latin America were USD 772 million (–2%, +8% cc).

The following table provides an overview of net sales to third parties by business franchise in the Sandoz Division:

(USD millions)	**Year ended Dec 31, 2020**	Year ended Dec 31, 2019	Change in USD %	Change in constant currencies %
Retail Generics[1]	7 244	7 590	– 5	– 4
Biopharmaceuticals	1 928	1 607	20	19
Anti-Infectives (partner label/API)	474	534	– 11	– 12
Total Sandoz	**9 646**	**9 731**	**– 1**	**0**

[1] Of which USD 694 million (2019: USD 784 million) represents anti-infectives sold under the Sandoz name

Retail Generics

In Retail Generics, Sandoz develops, manufactures and markets active ingredients and finished dosage forms of small molecule pharmaceuticals to third parties across a broad range of therapeutic areas, as well as finished dosage form of anti-infectives sold to third parties.

Retail Generics sales were USD 7.2 billion (–5%, –4% cc) impacted by the declines in the US and COVID-19 related impact across regions.

Biopharmaceuticals

In Biopharmaceuticals, Sandoz develops, manufactures and markets protein- and other biotechnology-based products, including biosimilars, and provides biotechnology manufacturing services to other companies. The Biopharmaceuticals business also includes *Glatopa*, a generic version of Copaxone®, which treats relapsing forms of multiple sclerosis and is marketed in the US.

Global sales of Biopharmaceuticals (biosimilars, biopharmaceutical contract manufacturing and *Glatopa*) grew to USD 1.9 billion (+20%, +19% cc), driven by continued double-digit growth in Europe from *Hyrimoz* (adalimumab), *Erelzi* (etanercept) and *Zessly* (infliximab) and growth from *Omnitrope* (somatropin) across all regions. Launch roll-outs in other geographies also contributed to growth.

Anti-Infectives

In Anti-Infectives, Sandoz manufactures and supplies active pharmaceutical ingredients and intermediates, mainly antibiotics, for internal use by Retail Generics and for sale to third-party customers.

Total Anti-Infectives franchise sales were USD 1.2 billion (–11%, –11% cc) including finished dosage forms sold under the Sandoz name (USD 694 million, –11%, –10% cc) and Anti-Infectives sold to third parties for sale under their own name (USD 474 million, –11%, –12% cc), which were impacted by a planned contract discontinuation.

Operating income from continuing operations

The following table provides an overview of operating income from continuing operations by segment:

(USD millions)	Year ended Dec 31, 2020	% of net sales to third parties	Year ended Dec 31, 2019	% of net sales to third parties	Change in USD %	Change in constant currencies %
Innovative Medicines	**9 172**	**23.5**	**9 287**	**24.6**	**– 1**	**4**
Sandoz	**1 043**	**10.8**	**551**	**5.7**	**89**	**106**
Corporate	– 63		– 752		nm	nm
Operating income from continuing operations	**10 152**	**20.9**	**9 086**	**19.2**	**12**	**19**

Operating income was USD 10.2 billion (+12%, +19% cc) mainly driven by higher sales and productivity including lower spend.

Core operating income from continuing operations key figures[1]

(USD millions unless indicated otherwise)	Year ended Dec 31, 2020	Year ended Dec 31, 2019	Change in USD %	Change in constant currencies %
Core gross profit from continuing operations	**38 663**	**37 392**	**3**	**4**
Selling, general and administration	– 14 093	– 14 319	2	2
Research and development	– 8 484	– 8 386	– 1	0
Other income	323	495	– 35	– 39
Other expense	– 993	– 1 070	7	11
Core operating income from continuing operations	**15 416**	**14 112**	**9**	**13**
As % of net sales to third parties	31.7	29.7		

[1] For an explanation of non-IFRS measures and reconciliation tables, see "Item 5.A Operating results—Non-IFRS measures as defined by Novartis."

The adjustments made to operating income from continuing operations to arrive at core operating income from continuing operations amounted to USD 5.3 billion (compared to USD 5.0 billion in the prior year). For details please see "Item 5.A Operating results–2020 and 2019 reconciliation from IFRS results to core results."

Core operating income was USD 15.4 billion (+9%, +13% cc) driven by sales growth, lower spend and productivity. Core operating income margin was 31.7% of net sales, increasing by 2.0 percentage points (+2.8 percentage points cc).

The following table provides an overview of core operating income from continuing operations by segment:

(USD millions)	Year ended Dec 31, 2020	% of net sales to third parties	Year ended Dec 31, 2019	% of net sales to third parties	Change in USD %	Change in constant currencies %
Innovative Medicines	**13 645**	**35.0**	**12 650**	**33.5**	**8**	**11**
Sandoz	**2 334**	**24.2**	**2 094**	**21.5**	**11**	**15**
Corporate	– 563		– 632		11	14
Core operating income from continuing operations	**15 416**	**31.7**	**14 112**	**29.7**	**9**	**13**

Innovative Medicines

Operating income was USD 9.2 billion (–1%, +4% cc). Growth at constant currencies was mainly driven by sales growth, partly offset by lower divestment gains and higher amortization. Operating income margin was 23.5% of net sales, decreasing 1.1 percentage points (+0.1 percentage points cc).

Core adjustments were USD 4.5 billion, mainly due to USD 3.0 billion of amortization. Core adjustments increased compared to prior year (USD 3.4 billion) mainly due to lower divestment gains and higher amortization.

Core operating income was USD 13.6 billion (+8%, +11% cc) mainly driven by sales growth, lower COVID-19 related spending and improved gross margin productiv-

ity. Core operating income margin was 35.0% of net sales, increasing 1.5 percentage points (+2.2 percentage points cc).

Core gross margin increased by 0.4 percentage points (cc) mainly driven by productivity. Core R&D expenses as a percentage of net sales decreased by 0.9 percentage points (cc) mainly driven by the higher net sales, productivity, and COVID-19 related spending impacts. Core SG&A expenses declined by 1.2 percentage points (cc) benefiting from COVID-19 related spending impacts. Core Other Income and Expense net decreased the margin by 0.3 percentage points (cc).

Sandoz

Operating income was USD 1.0 billion, (+89%, +106% cc), an increase of USD 492 million versus prior year mainly due to lower impairments, continued gross margin improvements and lower spending. Operating income margin increased by 6.0 percentage points in constant currencies; currency had a negative impact of 0.9 percentage points, resulting in a net increase of 5.1 percentage points to 10.8% of net sales.

Core adjustments were USD 1.3 billion, mainly from USD 0.6 billion of amortization and impairments and USD 0.4 billion legal charges. Prior year core adjustments were USD 1.5 billion. The change in core adjustments compared to prior year was mainly due to higher prior year impairments.

Core operating income was USD 2.3 billion (+11%, +15% cc), driven by gross margin improvements, lower spending from cost discipline and COVID-19. Core operating income margin was 24.2% of net sales, increasing 2.7 percentage points (3.3 percentage points cc). Core gross margin increased by 1.9 percentage points (cc), driven by favorable product and geographic mix, ongoing productivity improvements and lower price effects. Core R&D increased by 0.5 percentage points (cc) driven by biosimilar pipeline investments. Core SG&A expenses declined by 1.6 percentage points (cc) benefiting from COVID-19 related spending impacts. Core Other Income and Expense decreased by 0.3 percentage points (cc).

Corporate income and expense, net

Corporate income and expense, which includes the cost of Group headquarter and coordination functions, amounted to an expense of USD 63 million in the full year, compared to an expense of USD 752 million in prior year, mainly driven by favorable contributions from the Novartis Venture Fund, income from a fair value adjustment on contingent receivables, royalty settlement gains related to intellectual property rights and lower restructuring costs.

Innovative Medicines Division research and development

The following table provides an overview of the reported and core research and development expense of the Innovative Medicines Division:

(USD millions unless indicated otherwise)	**Year ended Dec 31, 2020**	Year ended Dec 31, 2019	Change in USD %	Change in constant currencies %
Research and exploratory development	– 2 737	– 2 855	4	6
Confirmatory development	– 5 381	– 5 297	– 2	– 1
Total Innovative Medicines Division research and development expense	**– 8 118**	**– 8 152**	**0**	**2**
As % of Innovative Medicines net sales to third parties	20.8	21.6		
Core research and exploratory development[1]	– 2 682	– 2 706	1	3
Core confirmatory development[1]	– 4 954	– 4 879	– 2	– 0
Total core Innovative Medicines Division research and development expense	**– 7 636**	**– 7 585**	**– 1**	**1**
As % of Innovative Medicines net sales to third parties	19.6	20.1		

[1] Core excludes impairments, amortization and certain other items. For an explanation of non-IFRS measures and reconciliation tables, see "Item 5.A Operating results—Non-IFRS measures as defined by Novartis."

Innovative Medicines Division research and exploratory development expense decreased by 4% (+6% cc) to USD 2.7 billion, and confirmatory development expense amounted to USD 5.4 billion, increasing by 2% (–1% cc) versus prior year. This was mainly due to lower impairment charges, lower spending due to COVID-19 and productivity.

Total core research and development expense in the Innovative Medicines Division as a percentage of sales decreased by 0.5 percentage points (0.9 percentage points cc) to 19.6% of net sales, mainly driven by the higher net sales, productivity, and COVID-19 related spending impacts.

Non-operating income and expense

The term "non-operating income and expense" includes all income and expense items outside operating income. The following table provides an overview of non-operating income and expense from continuing operations:

(USD millions unless indicated otherwise)	**Year ended Dec 31, 2020**	Year ended Dec 31, 2019	Change in USD %	Change in constant currencies %
Operating income from continuing operations	**10 152**	**9 086**	**12**	**19**
Income from associated companies	673	659	2	2
Interest expense	– 869	– 850	– 2	– 4
Other financial income and expense	– 78	45	nm	nm
Income before taxes from continuing operations	**9 878**	**8 940**	**10**	**17**
Taxes	– 1 807	– 1 793	– 1	– 7
Net income from continuing operations	**8 071**	**7 147**	**13**	**20**
Net loss from discontinued operations before gain on distribution of Alcon Inc. to Novartis AG shareholders		– 101	nm	nm
Gain on distribution of Alcon Inc. to Novartis AG shareholders		4 691	nm	nm
Net income from discontinued operations		**4 590**	nm	nm
Net income	**8 071**	**11 737**	**– 31**	**– 27**
Attributable to:				
Shareholders of Novartis AG	*8 072*	*11 732*	*– 31*	*– 27*
Non-controlling interests	*– 1*	*5*	*nm*	*nm*
Basic earnings per share from continuing operations (USD)	**3.55**	**3.12**	**14**	**21**
Basic earnings per share from discontinued operations (USD)		2.00	nm	nm
Total basic earnings per share (USD)	**3.55**	**5.12**	**– 31**	**– 26**

nm = not meaningful

Income from associated companies

Income from associated companies amounted to USD 673 million in 2020 compared to USD 659 million in the prior year. This comprises mainly the share of income from Roche amounting to USD 677 million, which was broadly in line with the prior year amount of USD 662 million.

Interest expense and other financial income and expense

Interest expense increased to USD 869 million from USD 850 million in the prior year, mainly due to an increase in interest expense from discounting long term liabilities.

Other financial income and expense amounted to a loss of USD 78 million compared to an income of USD 45 million in prior year mainly due to lower interest income in 2020.

Taxes

The tax rate for continuing operations was 18.3% compared to 20.1% in the prior year. The current year tax rate was impacted by the effect of non-deductible legal charges and uncertain tax positions. The prior year tax rate was impacted by a one-time, non-cash deferred tax expense resulting from legal entity reorganizations, a prior year item and an increase to an uncertain tax position, partially offset by the deferred tax credit from Swiss tax reform.

Excluding these impacts, the rate from continuing operations would have been 15.6% compared to 15.4% in the prior year. The increase from prior year was mainly the result of a change in profit mix.

Net income from continuing operations

Net income was USD 8.1 billion (+13%, +20% cc) mainly driven by higher operating income.

Earnings per share

Basic earnings per share from continuing operations were USD 3.55 (+14%, +21% cc), growing faster than net income and benefiting from lower weighted average number of shares outstanding.

Core non-operating income and expense from continuing operations[1]

The following table provides an overview of core non-operating income and expense from continuing operations:

(USD millions unless indicated otherwise)	Year ended Dec 31, 2020	Year ended Dec 31, 2019	Change in USD %	Change in constant currencies %
Core operating income from continuing operations	**15 416**	**14 112**	**9**	**13**
Core income from associated companies	1 097	1 086	1	1
Core interest expense	– 869	– 850	– 2	– 4
Core other financial income and expense	– 83	56	nm	nm
Core income before taxes from continuing operations	**15 561**	**14 404**	**8**	**11**
Core taxes	– 2 403	– 2 300	– 4	– 8
Core net income from continuing operations	**13 158**	**12 104**	**9**	**12**
Core basic earnings per share from continuing operations (USD)	**5.78**	**5.28**	**9**	**13**

[1] For an explanation of non-IFRS measures and reconciliation tables, see "Item 5.A Operating results—Non-IFRS measures as defined by Novartis."

Core income from associated companies

Core income from associated companies was USD 1.1 billion in 2020, in line with the prior year, mainly driven by the core income contribution from Roche.

Core interest expense and other financial income and expense

Core interest expense increased to USD 869 million from USD 850 million in the prior year, mainly due to an increase in interest expense from discounting long term liabilities. Core other financial income and expense amounted to a loss of USD 83 million compared to an income of USD 56 million in prior year mainly due to lower interest income in 2020.

Core taxes

The core tax rate from continuing operations (core taxes as a percentage of core income before tax from continuing operations) was 15.4% compared to 16.0% in the prior year mainly as a result of a change in profit mix.

Core net income

Core net income was USD 13.2 billion (+9%, +12% cc) mainly driven by growth in core operating income.

Core earnings per share

Core earnings per share were USD 5.78 (+9%, +13% cc), growing faster than core net income and benefiting from lower weighted average number of shares outstanding.

Discontinued operations

Discontinued operations include the business of Alcon and certain corporate costs directly attributable to Alcon up to the spin-off date. As the Alcon spin-off was completed on April 9, 2019, the prior year included three months of operating results of the divested business.

In 2020, there were no operational activities related to discontinued operations. In 2019, discontinued operations net sales were USD 1.8 billion, operating income amounted to USD 71 million and net income from discontinued operations was USD 4.6 billion, including the non-taxable non-cash net gain on distribution of Alcon Inc. to Novartis AG shareholders which amounted to USD 4.7 billion.

For further details, see "Item 18. Financial Statements—Note 1. Significant accounting policies—Distribution of Alcon Inc. to Novartis AG shareholders," "Item 18. Financial Statements—Note 2. Significant transactions—Significant transactions in 2019—Completion of the spin-off of the Alcon business through a dividend in kind distribution to Novartis AG shareholders," and "Item 18. Financial Statements—Note 30. Discontinued operations."

Total Group

For the total Group, net income amounted to USD 8.1 billion compared to USD 11.7 billion in the prior year, including the non-taxable non-cash net gain on distribution of Alcon Inc. which amounted to USD 4.7 billion. Basic earnings per share were USD 3.55 compared to USD 5.12 in prior year. Cash flow from operating activities for the total Group amounted to USD 13.6 billion and free cash flow to USD 11.7 billion.

Factors affecting comparability of year-on-year results of operations

Significant transactions in 2020 and 2019

The comparability of the year-on-year results of our operations for the total Group can be significantly affected by acquisitions and divestments. As part of our long-term strategy to focus Novartis as a leading medicines company, we announced and/or completed several acquisitions and divestments during 2020 and 2019.

A detailed description of significant transactions in 2020 and 2019, can be found in "Item 18. Financial Statements—Note 2. Significant transactions."

Critical accounting policies and estimates

Our significant accounting policies which are prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB) are set out in "Item 18. Financial Statements—Note 1. Significant accounting policies."

Given the uncertainties inherent in our business activities, we must make certain estimates and assumptions that require difficult, subjective and complex judgments. Because of uncertainties inherent in such judgments, actual outcomes and results may differ from our assumptions and estimates, which could materially affect the Group's consolidated financial statements. Application of the following accounting policies requires certain assumptions and estimates that have the potential for the most significant impact on our consolidated financial statements.

Deductions from revenues

As is typical in the pharmaceutical industry, our gross sales are subject to various deductions, which are primarily composed of rebates and discounts to retail customers, government agencies, wholesalers, health insurance companies and managed healthcare organizations. These deductions represent estimates of the related obligations, requiring the use of judgment when estimating the effect of these sales deductions on gross sales for a reporting period. These adjustments are deducted from gross sales to arrive at net sales.

The following summarizes the nature of some of these deductions and how the deduction is estimated. After recording these, net sales represent our best estimate of the cash that we expect to ultimately collect. The US market has the most complex arrangements related to revenue deductions.

United States-specific healthcare plans and program rebates

The United States Medicaid Drug Rebate Program is administered by state governments, using state and federal funds to provide assistance to certain vulnerable and needy individuals and families. Calculating the rebates to be paid related to this program involves interpreting relevant regulations, which are subject to challenge or change in interpretative guidance by government authorities. Provisions for estimating Medicaid rebates are calculated using a combination of historical experience, product and population growth, product pricing, and the mix of contracts and specific terms in the individual state agreements.

The United States Federal Medicare Program, which funds healthcare benefits to individuals aged 65 and older, and to people with certain disabilities, provides prescription drug benefits under the Part D section of the program. This benefit is provided and administered through private prescription drug plans. Provisions for estimating Medicare Part D rebates are calculated based on the terms of individual plan agreements, product sales and population growth, product pricing, and the mix of contracts.

We offer rebates to key managed healthcare and private plans in an effort to ensure patient access to our products and to sustain and increase the market share of our products. These programs provide a rebate after the plans have demonstrated they have met all terms and conditions set forth in their contract with us.

These rebates are estimated based on the terms of individual agreements, historical experience, product pricing and projected product growth rates, and are recorded as a deduction from revenue at the time the related revenues are recorded.

These provisions are adjusted based on established processes and experiences from filing data with individual states and plans. There is often a time lag of several months between recording of the revenue deductions and the final accounting for them.

Non-United States-specific healthcare plans and program rebates

In certain countries other than the US, we provide rebates to governments and other entities. These rebates are often mandated by laws or government regulations. These rebates are estimated based on government regulations, laws and terms of individual rebate arrangements, historical experience and other relevant factors, and are recorded as a deduction from revenue at the time the related revenue is recorded. These estimates are adjusted periodically to reflect actual experience. There is often a time lag of several months between the recording of revenue deductions and the final accounting for them.

Innovative pay-for-performance arrangements

In several countries, we enter into innovative pay-for-performance arrangements (i.e. outcome based arrange-

ments) with certain healthcare providers. Under these agreements, we may be required to make refunds to the healthcare providers or to provide additional medicines free of charge if anticipated treatment outcomes do not meet predefined targets. The impact of potential refunds or the delivery of additional medicines at no cost is estimated and recorded as a deduction from revenue at the time the related revenues are recorded. Estimates are based on historical experience and clinical data. In cases where historical experience and clinical data are not sufficient for a reliable estimation of the outcome, revenue recognition is deferred until such history is available.

There is often a time lag of several months between recording of the revenue deductions and the final accounting for them.

Non-healthcare plans and program rebates, returns and other deductions

We offer rebates to purchasing organizations and other direct and indirect customers to sustain and increase market share and to ensure patient access to our products. Since rebates are contractually agreed upon, the related provisions are estimated based on the terms of the individual agreements, historical experience and projected product sales growth rates.

Chargebacks occur where our subsidiaries have arrangements with indirect customers to sell products at prices that are lower than the price charged to wholesalers. A chargeback represents the difference between the invoice price to the wholesaler and the indirect customer's contract price. We account for chargebacks by reducing revenue by the estimate of chargebacks attributable to a sales transaction. Provisions for estimated chargebacks are calculated using a combination of factors, such as historical experience, product growth rates, product pricing, level of inventory in the distribution channel, and the terms of individual agreements.

When we sell a product providing a customer the right to return it, we record a provision for estimated sales returns based on our sales return policy and historical return rates. Other factors considered include actual product recalls, expected marketplace changes, the remaining shelf life of the product, and the expected entry of generic products. In 2020, sales returns amounted to approximately 1% of gross product sales. If sufficient experience is not available, sales are only recorded based on evidence of product consumption or when the right of return has expired.

We enter into distribution service agreements with major wholesalers, which provide a financial disincentive for the wholesalers to purchase product quantities in excess of current customer demand. Where possible, we adjust shipping patterns for our products to maintain wholesalers' inventory levels consistent with underlying patient demand.

We offer cash discounts to customers to encourage prompt payment. Cash discounts are estimated and accrued at the time of invoicing and are deducted from revenue.

Following a decrease in the price of a product, we generally grant customers a "shelf stock adjustment" for their existing inventory for the relevant product. Provisions for shelf stock adjustments, which are primarily relevant within the Sandoz Division, are determined at the time of the price decline or at the point of sale, if the impact of a price decline on the products sold can be reasonably estimated based on the customer's inventory levels of the relevant product.

Other sales discounts, such as consumer coupons and copay discount cards, are offered in some markets. The estimated amounts of these discounts are recorded at the time of sale or when the coupons are issued, and are estimated utilizing historical experience and the specific terms for each program. If a discount for a probable future transaction is offered as part of a sales transaction, then an appropriate portion of revenue is deferred to cover this estimated obligation.

In addition, we offer global patient assistance programs.

We adjust provisions for revenue deductions periodically to reflect actual experience. To evaluate the adequacy of provision balances, we use internal and external estimates of the inventory in transit, the level of inventory in the distribution and retail channels, actual claims data received, and the time lag for processing rebate claims. External data sources include reports from wholesalers and third-party market data purchased by Novartis.

For the table showing the worldwide extent of our revenue deductions provisions and related payment experiences for the Group see "Item 18. Financial Statements—Note 22. Provisions and other current liabilities."

Gross-to-net sales reconciliation

The table below shows the gross-to-net sales reconciliation for our Innovative Medicines Division:

(USD millions)	2020	In % of gross sales to third parties	2019	In % of gross sales to third parties
Innovative Medicines gross sales subject to deductions	**56 067**	**100.0**	**52 956**	**100.0**
US-specific healthcare plans and program rebates	– 5 412	– 9.7	– 4 824	– 9.1
Non-US-specific healthcare plans and program rebates	– 3 746	– 6.7	– 3 438	– 6.5
Non-healthcare plans and program-related rebates, returns and other deductions	– 7 896	– 14.0	– 6 980	– 13.2
Total Innovative Medicines gross-to-net sales adjustments	**– 17 054**	**– 30.4**	**– 15 242**	**– 28.8**
Innovative Medicines net sales	**39 013**	**69.6**	**37 714**	**71.2**

Impairment of goodwill, intangible assets and property, plant and equipment

We review long-lived intangible assets and property, plant and equipment for impairment whenever events or changes in circumstance indicate that the asset's balance sheet carrying amount may not be recoverable. Goodwill and other currently not amortized intangible assets are reviewed for impairment at least annually.

An asset is considered impaired when its balance sheet carrying amount exceeds its estimated recoverable amount, which is defined as the higher of its fair value less costs of disposal and its value in use. Usually, Novartis applies the fair value less costs of disposal method for its impairment assessment. In most cases, no directly observable market inputs are available to measure the fair value less costs of disposal. Therefore, an estimate is derived indirectly and is based on net present value techniques utilizing post-tax cash flows and discount rates. In the limited cases where the value in use method would be applied, net present value techniques would be applied using pre-tax cash flows and discount rates.

Fair value less costs of disposal reflects estimates of assumptions that market participants would be expected to use when pricing the asset or cash generating units (CGUs), and for this purpose, management considers the range of economic conditions that are expected to exist over the remaining useful life of the asset.

The estimates used in calculating the net present values are highly sensitive and depend on assumptions specific to the nature of the Group's activities as indicated in "Item 18. Financial Statements—Note 1. Significant accounting policies." Due to these factors, actual cash flows and values could vary significantly from forecasted future cash flows and related values derived using discounting techniques.

The recoverable amount of the grouping of cash-generating units to which goodwill is allocated is based on fair value less costs of disposal. The valuations are derived from applying discounted future cash flows based on key assumptions, including the terminal growth rate and discount rate. For additional information on impairment charges recognized and reversed by divisions, see "Item 18. Financial Statements—Note 1. Significant accounting policies—Impairment of goodwill and intangible assets" and "Item 18. Financial Statements—Note 11. Goodwill and intangible assets."

Goodwill and other intangible assets represent a significant part of our consolidated balance sheet, primarily due to acquisitions. Although no significant additional impairments are currently anticipated, impairment evaluation could lead to material impairment charges in the future. For more information, see "Item 18. Financial Statements—Note 11. Goodwill and intangible assets."

For net impairment charges for property, plant and equipment from continuing operations see "Item 18. Financial Statements—Note 9. Property, plant and equipment."

Contingent consideration

In an acquisition or divestment of a business, it is necessary to recognize contingent future amounts due to previous owners representing contractually defined potential amounts as a liability or asset. Usually for Novartis, these are linked to milestone or royalty payments related to certain assets and are recognized as a financial liability or financial asset at their fair value, which is then remeasured at each subsequent reporting date. These estimations typically depend on factors such as technical milestones or market performance, and are adjusted for the probability of their likelihood of payment and, if material, are appropriately discounted to reflect the impact of time.

Changes in the fair value of contingent consideration liabilities in subsequent periods are recognized in the consolidated income statement in "Cost of goods sold" for currently marketed products and in "Research and development" for in-process research and development (IPR&D). Changes in contingent consideration assets are recognized in "Other income" or "Other expense," depending on their nature.

The effect of unwinding the discount over time is recognized for contingent liabilities in "Interest expense" and for contingent assets as interest income recognized in the consolidated income statement within "Other financial income and expense."

Retirement and other post-employment benefit plans

We sponsor pension and other post-employment benefit plans in various forms that cover a significant portion of our current and former associates. For post-employment plans with defined benefit obligations, we are required to make significant assumptions and estimates about future events in calculating the expense and the present value of the liability related to these plans. These include assumptions about the interest rates we apply to estimate future defined benefit obligations and net periodic pension expense, as well as rates of future pension increases. In addition, our actuarial consultants provide our management with historical statistical information, such as withdrawal and mortality rates in connection with these estimates.

Assumptions and estimates used by the Group may differ materially from the actual results we experience due to changing market and economic conditions, higher or lower withdrawal rates, and longer or shorter life spans of participants, among other factors.

Depending on events, such differences could have a material effect on our total equity. For more information on obligations under retirement and other post-employment benefit plans and underlying actuarial assumptions, see "Item 18. Financial Statements—Note 25. Post-employment benefits for associates."

Provisions and contingencies

A number of Group companies are involved in various government investigations and legal proceedings (intellectual property, sales and marketing practices, product liability, commercial, employment and wrongful discharge, environmental claims, etc.) arising out of the normal conduct of their businesses. For more information, see "Item 18. Financial Statements—Note 20. Provisions and other

non-current liabilities" and "Item 18. Financial Statements—Note 28. Commitments and contingencies."

We record provisions for legal proceedings when it is probable that a liability has been incurred and the amount can be reliably estimated. These provisions are adjusted periodically as assessments change or additional information becomes available. For significant product liability cases, the provision is actuarially determined based on factors such as past experience, amount and number of claims reported, and estimates of claims incurred but not yet reported.

Provisions are recorded for environmental remediation costs when expenditure on remedial work is probable and the cost can be reliably estimated. Remediation costs are provided for under "Non-current liabilities" in the Group's consolidated balance sheet.

Provisions relating to estimated future expenditure for liabilities do not usually reflect any insurance or other claims or recoveries, since these are only recognized as assets when the amount is reasonably estimable and collection is virtually certain.

Research and development

Internal research and development (R&D) costs are fully charged to the consolidated income statement in the period in which they are incurred. We consider that regulatory and other uncertainties inherent in the development of new products preclude the capitalization of internal development expenses as an intangible asset usually until marketing approval from the regulatory authority is obtained in a relevant major market, such as for the United States, the European Union or Switzerland.

Costs for post-approval studies performed to support the continued registration of a marketed product are recognized as marketing expenses. Costs for activities that are required by regulatory authorities as a condition for obtaining marketing approval are capitalized and recognized as currently marketed products.

Healthcare contributions

In some countries, our subsidiaries are required to make contributions to the country's healthcare costs as part of programs other than the ones mentioned above under deductions from revenues. The amounts to be paid depend on various criteria such as the subsidiary's market share or sales volume compared to certain targets. Considerable judgment is required in estimating these contributions, as not all data is available when the estimates need to be made.

The largest of these healthcare contributions relates to the US healthcare reform fee, which was introduced in 2011. This fee is an annual levy paid by US pharmaceutical companies, including various Novartis subsidiaries. The calculation of the annual expense for this levy requires use of management judgement and estimates. This is required as the US healthcare reform fee owed is based on the Group's percentage share of the total industry qualifying sales subject to the healthcare reform fee, which requires estimation as the total industry qualifying sales subject to the healthcare reform fee is not publicly available until the following year when the fee is due for payment. This pharmaceutical fee levy is recognized in "Other expense."

Taxes

We prepare and file our tax returns based on an interpretation of tax laws and regulations, and we record estimates based on these judgments and interpretations. Our tax returns are subject to examination by the competent taxing authorities, which may result in an assessment being made, requiring payments of additional tax, interest or penalties. Since Novartis uses its intellectual property globally to deliver goods and services, the transfer prices within the Group as well as arrangements between subsidiaries to finance research and development and other activities may be challenged by the national tax authorities in any of the jurisdictions in which Novartis operates. Therefore, inherent uncertainties exist in our estimates of our tax positions, but we believe that our estimated amounts for current and deferred tax assets or liabilities, including any amounts related to any uncertain tax positions, are appropriate based on currently known facts and circumstances.

Internal control over financial reporting

The Group's management has assessed the effectiveness of internal control over financial reporting. The Group's independent statutory auditor also issued an opinion on the effectiveness of internal control over financial reporting. Both the Group's management and its external auditors concluded that the Group maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020. For more details, see "Item 15. Controls and Procedures."

Approach to risk management

See "Item 6. Directors, Senior Management and Employees—Item 6.C Board practices—Corporate governance—Information and control systems—Risk management" and "Item 18. Financial Statements—Note 29. Financial instruments – additional disclosures."

Non-IFRS measures as defined by Novartis

Novartis uses certain non-IFRS metrics when measuring performance, especially when measuring current-year results against prior periods, including core results, constant currencies, free cash flow and net debt.

Despite the use of these measures by management in setting goals and measuring the Group's performance, these are non-IFRS measures that have no standardized meaning prescribed by IFRS. As a result, such measures have limits in their usefulness to investors.

Because of their non-standardized definitions, the non-IFRS measures (unlike IFRS measures) may not be comparable to the calculation of similar measures of other companies. These non-IFRS measures are presented solely to permit investors to more fully understand how the Group's management assesses underlying performance. These non-IFRS measures are not, and should not be viewed as, a substitute for IFRS measures, and should be viewed in conjunction with IFRS financials.

As an internal measure of Group performance, these non-IFRS measures have limitations, and the Group's performance management process is not solely restricted to these metrics.

Core results

The Group's core results – including core operating income, core net income and core earnings per share – exclude fully the amortization and impairment charges of intangible assets, excluding software, net gains and losses on fund investments and equity securities valued at fair value through profit and loss, and certain acquisition- and divestment-related items. The following items that exceed a threshold of USD 25 million are also excluded: integration- and divestment-related income and expenses; divestment gains and losses; restructuring charges/releases and related items; legal-related items; impairments of property, plant and equipment, and financial assets, and income and expense items that management deems exceptional and that are or are expected to accumulate within the year to be over a USD 25 million threshold.

Novartis believes that investor understanding of the Group's performance is enhanced by disclosing core measures of performance since, core measures exclude items that can vary significantly from year to year, they enable better comparison of business performance across years. For this same reason, Novartis uses these core measures in addition to IFRS and other measures as important factors in assessing the Group's performance.

The following are examples of how these core measures are utilized:

- In addition to monthly reports containing financial information prepared under International Financial Reporting Standards (IFRS), senior management receives a monthly analysis incorporating these core measures.
- Annual budgets are prepared for both IFRS and core measures.

As an internal measure of Group performance, the core results measures have limitations, and the Group's performance management process is not solely restricted to these metrics. A limitation of the core results measures is that they provide a view of the Group's operations without including all events during a period, such as the effects of an acquisition, divestment, or amortization/impairments of purchased intangible assets and restructurings.

Constant currencies

Changes in the relative values of non-US currencies to the US dollar can affect the Group's financial results and financial position. To provide additional information that may be useful to investors, including changes in sales volume, we present information about our net sales and various values relating to operating and net income that are adjusted for such foreign currency effects.

Constant currency calculations have the goal of eliminating two exchange rate effects so that an estimate can be made of underlying changes in the consolidated income statement excluding the impact of fluctuations in exchanges rates:

- The impact of translating the income statements of consolidated entities from their non-USD functional currencies to USD
- The impact of exchange rate movements on the major transactions of consolidated entities performed in currencies other than their functional currency

We calculate constant currency measures by translating the current year's foreign currency values for sales and other income statement items into USD, using the average exchange rates from the prior year and comparing them to the prior-year values in USD.

We use these constant currency measures in evaluating the Group's performance, since they may assist us in evaluating our ongoing performance from year to year. However, in performing our evaluation, we also consider equivalent measures of performance that are not affected by changes in the relative value of currencies.

Growth rate calculation

For ease of understanding, Novartis uses a sign convention for its growth rates such that a reduction in operating expenses or losses compared to the prior year is shown as a positive growth.

Free cash flow

Novartis defines free cash flow as net cash flows from operating activities and cash flows from investing activities associated with purchases and sales of property, plant and equipment, of intangible assets, of financial assets and of other non-current assets. Excluded from free cash flow are cash flows from investing activities associated with acquisitions and divestments of businesses and of interests in associated companies, purchases and sales of marketable securities and commodities and net cash flows from financing activities.

Free cash flow is a non-IFRS measure and is not intended to be a substitute measure for net cash flows from operating activities as determined under IFRS. Free cash flow is presented as additional information because management believes it is a useful supplemental indicator of the Group's ability to operate without reliance on additional borrowing or use of existing cash. Free cash flow is a measure of the net cash generated that is available for investment in strategic opportunities, returning to shareholders and for debt repayment. Free cash flow is a non-IFRS measure, which means it should not be interpreted as a measure determined under IFRS.

Net debt

Novartis calculates net debt as current financial debts and derivative financial instruments plus non-current financial debt less cash and cash equivalents and marketable securities, commodities, time deposits and derivative financial instruments.

Net debt is a non-IFRS measure, which means it should not be interpreted as a measure determined under IFRS. Net debt is presented as additional information because management believes it is a useful supplemental indicator of the Group's ability to pay dividends, to meet financial commitments, and to invest in new strategic opportunities, including strengthening its balance sheet.

Novartis Cash Value Added

Novartis Cash Value Added (NCVA) is a metric that is based on what the Company assesses to be its cash flow return less a capital charge on gross operating assets. NCVA is used as the primary internal financial measure for determining payouts under the old Long-Term Performance Plan (LTPP) introduced in 2014. The LTPP performance measures were changed effective January 1, 2019, and from the 2019 cycle onward no longer include NCVA as a performance measure. More information on NCVA is presented as part of the Compensation Report; see "Item 6. Directors, Senior Management and Employees—Item 6.B Compensation."

Additional information

EBITDA

Novartis defines earnings before interest, tax, depreciation and amortization (EBITDA) as operating income, excluding depreciation of property, plant and equipment, depreciation of right-of-use assets, amortization of intangible assets, and impairments of plant and equipment, right-of-use assets and of intangible assets.

(USD millions)	**2020**	2019
Operating income from continuing operations	**10 152**	**9 086**
Depreciation of property, plant and equipment	1 318	1 345
Depreciation of the right-of-use-assets	330	305
Amortization of intangible assets	3 462	2 836
Impairments of property, plant and equipment, and intangible assets [1]	1 354	1 340
EBITDA from continuing operations	**16 616**	**14 912**
Operating income from discontinued operations		**71**
Depreciation of property, plant and equipment		42
Depreciation of the right-of-use-assets		9
Amortization of intangible assets		174
EBITDA from discontinued operations		**296**
EBITDA Total Group	**16 616**	**15 208**

[1] There were no impairments of right-of-use assets in 2020 and 2019.

Enterprise value

Enterprise value represents the total amount that shareholders and debt holders have invested in Novartis, less the Group's liquidity.

(USD millions)	**Dec 31, 2020**	Dec 31, 2019
Market capitalization	214 269	214 815
Non-controlling interests	68	77
Non-current financial debts	26 259	20 353
Current financial debts and derivatives financial instruments	9 785	7 031
Marketable securities, commodities, time deposits and derivative financial instruments	– 1 905	– 334
Cash and cash equivalents	– 9 658	– 11 112
Enterprise value	**238 818**	**230 830**

Reconciliation from IFRS results to core results

The following tables provide an overview of the reconciliation from IFRS results to core results.

2020 and 2019 reconciliation from IFRS results to core results

	Innovative Medicines		Sandoz		Corporate		Group	
(USD millions unless indicated otherwise)	**2020**	2019	**2020**	2019	**2020**	2019	**2020**	2019
IFRS operating income from continuing operations	**9 172**	**9 287**	**1 043**	**551**	**– 63**	**– 752**	**10 152**	**9 086**
Amortization of intangible assets	**2 999**	**2 447**	**366**	**314**			**3 365**	**2 761**
Impairments								
Intangible assets	759	632	141	503			900	1 135
Property, plant and equipment related to the Group-wide rationalization of manufacturing sites	321	83	112	69			433	152
Other property, plant and equipment		10	2	33			2	43
Total impairment charges	**1 080**	**725**	**255**	**605**			**1 335**	**1 330**
Acquisition or divestment of businesses and related items								
- Income	– 5	– 8			– 73	– 108	– 78	– 116
- Expense	107	87	22		89	115	218	202
Total acquisition or divestment of businesses and related items, net	**102**	**79**	**22**		**16**	**7**	**140**	**86**
Other items								
Divestment gains	– 348	– 1 091	– 27		– 39	2	– 414	– 1 089
Financial assets – fair value adjustments	– 153	– 18			– 183	– 20	– 336	– 38
Restructuring and related items								
- Income	– 36	– 58	– 30	– 7	– 28	– 6	– 94	– 71
- Expense	484	509	252	390	35	113	771	1 012
Legal-related items								
- Income				– 32				– 32
- Expense	555	999	406	156	– 26		935	1 155
Additional income	– 264	– 316	– 6	– 4	– 361	– 95	– 631	– 415
Additional expense	54	87	53	121	86	119	193	327
Total other items	**292**	**112**	**648**	**624**	**– 516**	**113**	**424**	**849**
Total adjustments	**4 473**	**3 363**	**1 291**	**1 543**	**– 500**	**120**	**5 264**	**5 026**
Core operating income from continuing operations	**13 645**	**12 650**	**2 334**	**2 094**	**– 563**	**– 632**	**15 416**	**14 112**
as % of net sales	*35.0%*	*33.5%*	*24.2%*	*21.5%*			*31.7%*	*29.7%*
Income from associated companies	1	1	2	2	670	656	673	659
Core adjustments to income from associated companies, net of tax					424	427	424	427
Interest expense							– 869	– 850
Other financial income and expense							– 78	45
Core adjustments to other financial income and expense							– 5	11
Taxes, adjusted for above items (core taxes)							– 2 403	– 2 300
Core net income from continuing operations							**13 158**	**12 104**
Core net income from discontinued operations [1]								278
Core net income							**13 158**	**12 382**
Core net income attributable to shareholders of Novartis AG							**13 159**	**12 377**
Core basic EPS from continuing operations (USD) [2]							**5.78**	**5.28**
Core basic EPS from discontinued operations (USD) [2]								0.12
Core basic EPS (USD) [2]							**5.78**	**5.40**

[1] For details on discontinued operations reconciliation from IFRS to core net income, please refer to page 76.
[2] Earnings per share (EPS) is calculated on the amount of net income attributable to shareholders of Novartis AG.

2020 and 2019 reconciliation from IFRS results to core results – Group

2020 (USD millions unless indicated otherwise)	IFRS results	Amortization of intangible assets[1]	Impairments[2]	Acquisition or divestment of businesses and related items[3]	Other items[4]	Core results
Gross profit from continuing operations	**34 777**	**3 301**	**377**	**70**	**138**	**38 663**
Operating income from continuing operations	**10 152**	**3 365**	**1 335**	**140**	**424**	**15 416**
Income before taxes from continuing operations	**9 878**	**3 789**	**1 335**	**140**	**419**	**15 561**
Taxes from continuing operations[5]	– 1 807					– 2 403
Net income from continuing operations	**8 071**					**13 158**
Net income	**8 071**					**13 158**
Basic EPS from continuing operations (USD)[6]	**3.55**					**5.78**
Basic EPS (USD)[6]	**3.55**					**5.78**
The following are adjustments to arrive at core gross profit						
Other revenues	1 239				– 136	1 103
Cost of goods sold	– 15 121	3 301	377	70	274	– 11 099
The following are adjustments to arrive at core operating income						
Selling, general and administration	– 14 197			16	88	– 14 093
Research and development	– 8 980	64	523	3	– 94	– 8 484
Other income	1 742		– 6	– 78	– 1 335	323
Other expense	– 3 190		441	129	1 627	– 993
The following are adjustments to arrive at core income before taxes						
Income from associated companies	673	424				1 097
Other financial income and expense	– 78				– 5	– 83

[1] Amortization of intangible assets: cost of goods sold includes the amortization of acquired rights to currently marketed products and other production-related intangible assets; research and development includes the amortization of acquired rights for technologies; income from associated companies includes USD 424 million for the Novartis share of the estimated Roche core items

[2] Impairments: cost of goods sold and research and development include impairment charges related to intangible assets; other income includes an impairment reversal related to property, plant and equipment; other expense includes impairment charges related to property, plant and equipment

[3] Acquisition or divestment of businesses and related items, including restructuring and integration charges: cost of goods sold, selling, general and administration, research and development and other expense include net charges related to acquisitions; other income and other expense include transitional service-fee income and expenses related to the Alcon distribution

[4] Other items: other revenues includes a settlement of royalties; cost of goods sold includes the cumulative amount of the depreciation up to December 31, 2019, recognized with the reclassification of property, plant and equipment out of assets of disposal group held for sale (see Item 18. Financial Statements–Note 2. Significant transactions–Significant transactions in 2020); cost of goods sold, other income and other expense include net restructuring and other charges related to the Group-wide rationalization of manufacturing sites; cost of goods sold, selling, general and administration, research and development, other income and other expense include other restructuring income and charges and related items; cost of goods sold and research and development also include adjustments to contingent considerations; selling, general and administration and other expense include expenses related to COVID-19 donations; selling, general and administration also includes adjustments to provisions; other income and other expense include fair value adjustments and divestment gains and losses on financial assets, and adjustments to environmental provisions; other income also includes net gains from the divestment of products, a fair value adjustment on a contingent receivable and adjustments to provisions; other expense includes adjustments to legal provisions, legal-related items and a termination fee; other financial income and expense includes a revaluation impact of a financial liability incurred through the Alcon distribution

[5] Taxes on the adjustments between IFRS and core results take into account, for each individual item included in the adjustment, the tax rate that will finally be applicable to the item based on the jurisdiction where the adjustment will finally have a tax impact. Generally, this results in amortization and impairment of intangible assets and acquisition-related restructuring and integration items having a full tax impact. There is usually a tax impact on other items, although this is not always the case for items arising from legal settlements in certain jurisdictions. Adjustments related to income from associated companies are recorded net of any related tax effect. Due to these factors and the differing effective tax rates in the various jurisdictions, the tax on the total adjustments for continuing operations of USD 5.7 billion to arrive at the core results before tax amounts to USD 596 million. The average tax rate on the adjustments is 10.5%.

[6] Earnings per share (EPS) is calculated on the amount of net income attributable to shareholders of Novartis AG.

2019 (USD millions unless indicated otherwise)	IFRS results	Amortization of intangible assets[1]	Impairments[2]	Acquisition or divestment of businesses and related items[3]	Other items[4]	Core results
Gross profit from continuing operations	**34 252**	**2 711**	**85**	**48**	**296**	**37 392**
Operating income from continuing operations	**9 086**	**2 761**	**1 330**	**86**	**849**	**14 112**
Income before taxes from continuing operations	**8 940**	**3 188**	**1 330**	**86**	**860**	**14 404**
Taxes from continuing operations[5]	– 1 793					– 2 300
Net income from continuing operations	**7 147**					**12 104**
Net income from discontinued operations[6]	4 590					278
Net income	**11 737**					**12 382**
Basic EPS from continuing operations (USD)[7]	**3.12**					**5.28**
Basic EPS from discontinued operations (USD)[7]	2.00					0.12
Basic EPS (USD)[7]	**5.12**					**5.40**
The following are adjustments to arrive at core gross profit						
Other revenues	1 179				– 66	1 113
Cost of goods sold	– 14 425	2 711	85	48	362	– 11 219
The following are adjustments to arrive at core operating income						
Selling, general and administration	– 14 369			10	40	– 14 319
Research and development	– 9 402	50	1 078	10	– 122	– 8 386
Other income	2 031		– 2	– 116	– 1 418	495
Other expense	– 3 426		169	134	2 053	– 1 070
The following are adjustments to arrive at core income before taxes						
Income from associated companies	659	427				1 086
Other financial income and expense	45				11	56

[1] Amortization of intangible assets: cost of goods sold includes the amortization of acquired rights to currently marketed products and other production-related intangible assets; research and development includes the amortization of acquired rights for technologies; income from associated companies includes USD 427 million for the Novartis share of the estimated Roche core items

[2] Impairments: cost of goods sold, and research and development include impairment charges related to intangible assets; research and development also includes the reversal of an impairment charge; cost of goods sold, other income and other expense include net impairment charges related to property, plant and equipment

[3] Acquisition or divestment of businesses and related items, including restructuring and integration charges: cost of goods sold, selling, general and administration, research and development, other income and other expense include net charges related to acquisitions; other income and other expense also include transitional service fee income and expenses related to the portfolio transformation and the Alcon distribution

[4] Other items: other revenues includes income from an outlicensing agreement, and income related to an amendment of a collaboration agreement; cost of goods sold, other income and other expense include net restructuring and other charges related to the Group-wide rationalization of manufacturing sites; cost of goods sold, research and development, selling, general and administration, other income and other expense include other restructuring income and charges and related items; cost of goods sold, and research and development also include fair value adjustments of contingent consideration liabilities; cost of goods sold also includes inventory write-offs and other provisions; selling, general and administration includes receivable expected credit loss provisions and other provisions; other income and other expense include fair value adjustments and divestment gains and losses on financial assets and legal-related items as well as environmental provisions; other income also includes net gains from the divestment of products and property, plant and equipment, and provision releases; other expense includes a provision for onerous contracts and other provisions; other financial income and expense includes a revaluation impact of a financial liability incurred through the Alcon distribution

[5] Taxes on the adjustments between IFRS and core results take into account, for each individual item included in the adjustment, the tax rate that will finally be applicable to the item based on the jurisdiction where the adjustment will finally have a tax impact. Generally, this results in amortization and impairment of intangible assets and acquisition-related restructuring and integration items having a full tax impact. There is usually a tax impact on other items, although this is not always the case for items arising from legal settlements in certain jurisdictions. Adjustments related to income from associated companies are recorded net of any related tax effect. Due to these factors and the differing effective tax rates in the various jurisdictions, the tax on the total adjustments for continuing operations of USD 5.5 billion to arrive at the core results before tax amounts to USD 507 million. The average tax rate on the adjustments is 9.3%.

[6] For details on discontinued operations reconciliation from IFRS to core net income please refer to page 76.

[7] Earnings per share (EPS) is calculated on the amount of net income, attributable to shareholders of Novartis AG.

2020 and 2019 reconciliation from IFRS results to core results – Innovative Medicines

2020 (USD millions)	IFRS results	Amortization of intangible assets[1]	Impairments[2]	Acquisition or divestment of businesses and related items[3]	Other items[4]	Core results
Gross profit	**29 896**	**2 935**	**250**	**48**	**146**	**33 275**
Operating income	**9 172**	**2 999**	**1 080**	**102**	**292**	**13 645**
The following are adjustments to arrive at core gross profit						
Cost of goods sold	– 10 927	2 935	250	48	146	– 7 548
The following are adjustments to arrive at core operating income						
Selling, general and administration	– 11 657			16	58	– 11 583
Research and development	– 8 118	64	509	3	– 94	– 7 636
Other income	922		– 1	– 5	– 687	229
Other expense	– 1 871		322	40	869	– 640

[1] Amortization of intangible assets: cost of goods sold includes the amortization of acquired rights to currently marketed products and other production-related intangible assets; research and development includes the amortization of acquired rights for technologies
[2] Impairments: cost of goods sold and research and development include impairment charges related to intangible assets; other income and other expense include net impairment charges related to property, plant and equipment
[3] Acquisition or divestment of businesses and related items, including restructuring and integration charges: cost of goods sold, selling, general and administration, research and development and other expense include net charges related to acquisitions; other income and other expense include transitional service-fee income and expenses related to the Alcon distribution
[4] Other items: cost of goods sold, other income and other expense include net restructuring and other charges related to the Group-wide rationalization of manufacturing sites; cost of goods sold, selling, general and administration, research and development, other income and other expense include other restructuring income and charges and related items; cost of goods sold and research and development also include adjustments to contingent considerations; selling, general and administration includes expenses related to COVID-19 donations and adjustments to provisions; other income and other expense include fair value adjustments on financial assets; other income also includes net gains from the divestment of products and financial assets and adjustments to provisions; other expense includes legal-related items and a termination fee

2019 (USD millions)	IFRS results	Amortization of intangible assets[1]	Impairments[2]	Acquisition or divestment of businesses and related items[3]	Other items[4]	Core results
Gross profit	**29 539**	**2 397**		**48**	**116**	**32 100**
Operating income	**9 287**	**2 447**	**725**	**79**	**112**	**12 650**
The following are adjustments to arrive at core gross profit						
Other revenues	1 092				– 66	1 026
Cost of goods sold	– 10 050	2 397		48	182	– 7 423
The following are adjustments to arrive at core operating income						
Selling, general and administration	– 11 617			10	25	– 11 582
Research and development	– 8 152	50	632	10	– 125	– 7 585
Other income	1 586		– 1	– 8	– 1 230	347
Other expense	– 2 069		94	19	1 326	– 630

[1] Amortization of intangible assets: cost of goods sold includes the amortization of acquired rights to currently marketed products and other production-related intangible assets; research and development includes the amortization of acquired rights for technologies
[2] Impairments: research and development includes impairment charges and a reversal of impairment charges related to intangible assets; other income and other expense include net impairment charges related to property, plant and equipment
[3] Acquisition or divestment of businesses and related items, including restructuring and integration charges: cost of goods sold, selling, general and administration, research and development, other income and other expense include net charges related to acquisitions; other income and other expense also include transitional service-fee income and expenses related to the portfolio transformation and the Alcon distribution
[4] Other items: other revenues includes a net income from an outlicensing agreement and an income related to an amendment of a collaboration agreement; cost of goods sold, other income and other expense include restructuring and other charges related to the Group-wide rationalization of manufacturing sites; cost of goods sold, research and development, other income and other expense include other restructuring income and charges and related items; cost of goods sold, and research and development also include fair value adjustments of contingent consideration liabilities; selling, general and administration includes other provisions; other income and other expense include fair value adjustments and divestment gains and losses on financial assets; other income also includes net gains from the divestment of products and property, plant and equipment, and provision releases; other expense includes legal-related items

2020 and 2019 reconciliation from IFRS to core results – Sandoz

2020 (USD millions)	IFRS results	Amortization of intangible assets[1]	Impairments[2]	Acquisition or divestment of businesses and related items[3]	Other items[4]	Core results
Gross profit	**4 636**	**366**	**127**	**22**	**128**	**5 279**
Operating income	**1 043**	**366**	**255**	**22**	**648**	**2 334**
The following are adjustments to arrive at core gross profit						
Cost of goods sold	– 5 252	366	127	22	128	– 4 609
The following are adjustments to arrive at core operating income						
Selling, general and administration	– 2 076				30	– 2 046
Research and development	– 862		14			– 848
Other income	176		– 5		– 62	109
Other expense	– 831		119		552	– 160

[1] Amortization of intangible assets: cost of goods sold includes the amortization of acquired rights to currently marketed products and other production-related intangible assets
[2] Impairments: cost of goods sold and research and development include impairment charges related to intangible assets; other income includes an impairment reversal related to property, plant and equipment; other expense includes impairment charges related to property, plant and equipment
[3] Acquisition or divestment of businesses and related items, including restructuring and integration charges: cost of goods sold includes net charges related to an acquisition
[4] Other items: cost of goods sold includes the cumulative amount of the depreciation up to December 31, 2019, recognized with the reclassification of property, plant and equipment out of assets of disposal group held for sale (see Item 18. Financial Statements–Note 2. Significant transactions–Significant transactions in 2020); cost of goods sold and other expense include restructuring and other charges related to the Group-wide rationalization of manufacturing sites; cost of goods sold, selling, general and administration, other income and other expense include other restructuring income and charges and related items; selling, general and administration also includes expenses related to COVID-19 donations and adjustments to provisions; other income includes net gains from the divestment of a product and adjustments to provisions; other expense includes a legal provision and legal-related items

2019 (USD millions)	IFRS results	Amortization of intangible assets[1]	Impairments[2]	Acquisition or divestment of businesses and related items	Other items[3]	Core results
Gross profit	**4 601**	**314**	**85**		**180**	**5 180**
Operating income	**551**	**314**	**605**		**624**	**2 094**
The following are adjustments to arrive at core gross profit						
Cost of goods sold	– 5 334	314	85		180	– 4 755
The following are adjustments to arrive at core operating income						
Selling, general and administration	– 2 218				15	– 2 203
Research and development	– 1 250		446		3	– 801
Other income	167		– 1		– 39	127
Other expense	– 749		75		465	– 209

[1] Amortization of intangible assets: cost of goods sold includes the amortization of acquired rights to currently marketed products and other production-related intangible assets
[2] Impairments: cost of goods sold, and research and development include impairment charges related to intangible assets; cost of goods sold, other income and other expense include net impairment charges related to property, plant and equipment
[3] Other items: cost of goods sold and other expense include net restructuring and other charges related to the Group-wide rationalization of manufacturing sites; cost of goods sold, selling, general and administration, other income and other expense include restructuring income and charges and related items; cost of goods sold also includes inventory write-offs and other provisions; selling, general and administration includes receivable expected credit loss provisions and other provisions; other income and other expense also include legal-related items; other expense also includes an environmental provision, a provision for onerous contracts and other provisions

2020 and 2019 reconciliation from IFRS results to core results – Corporate

2020 (USD millions)	IFRS results	Amortization of intangible assets	Impairments	Acquisition or divestment of businesses and related items[1]	Other items[2]	Core results
Gross profit	**245**				**– 136**	**109**
Operating loss	**– 63**			**16**	**– 516**	**– 563**
The following are adjustments to arrive at core gross profit						
Other revenues	168				– 136	32
The following are adjustments to arrive at core operating loss						
Other income	644			– 73	– 586	– 15
Other expense	– 488			89	206	– 193

[1] Acquisition or divestment of businesses and related items, including restructuring and integration charges: other income and other expense include transitional service fee income and expenses related to the Alcon distribution

[2] Other items: other revenues includes a settlement of royalties; other income and other expense include fair value adjustments and divestment gains and losses on financial assets, adjustments to environmental provisions and restructuring income and charges and related items; other income also includes a fair value adjustment on a contingent receivable and adjustments to provisions; other expense includes adjustments to legal provisions and expenses related to COVID-19 donations

2019 (USD millions)	IFRS results	Amortization of intangible assets	Impairments	Acquisition or divestment of businesses and related items[1]	Other items[2]	Core results
Gross profit	**112**					**112**
Operating loss	**– 752**			**7**	**113**	**– 632**
The following are adjustments to arrive at core operating loss						
Other income	278			– 108	– 149	21
Other expense	– 608			115	262	– 231

[1] Acquisition or divestment of businesses and related items, including restructuring and integration charges: other income and other expense include transitional service fee income and expenses related to the portfolio transformation and the Alcon distribution

[2] Other items: other income and other expense include fair value adjustments and divestment gains and losses on financial assets, restructuring income and charges and related items as well as environmental provisions

2019 reconciliation of IFRS results to core results – Discontinued operations

2019 (USD millions)	IFRS results	Amortization of intangible assets[1]	Impairments	Acquisition or divestment of businesses and related items[2]	Other items[3]	Core results
Gross profit	**949**	**165**			**9**	**1 123**
Operating income of discontinued operations	**71**	**167**			**112**	**350**
Income before taxes of discontinued operations	**58**					**337**
Taxes[4]	– 159					– 59
Net (loss)/income from discontinued operations before gain on distribution of Alcon Inc. to Novartis AG shareholders	**– 101**					**278**
Gain on distribution of Alcon Inc. to Novartis AG shareholders	4 691			– 4 691		
Net income from discontinued operations	**4 590**					**278**
Basic EPS (USD)[5]	**2.00**					**0.12**
The following are adjustments to arrive at core gross profit						
Cost of goods sold	– 860	165			9	– 686
The following are adjustments to arrive at core operating income						
Selling, general and administration	– 638				14	– 624
Research and development	– 142	2			4	– 136
Other income	15				– 3	12
Other expense	– 113				88	– 25

[1] Amortization of intangible assets: cost of goods sold includes the amortization of acquired rights to currently marketed products and other production-related intangible assets; research and development includes the amortization of acquired rights for technologies

[2] Acquisition or divestment of businesses and related items represents the non-taxable non-cash gain adjustment related to the distribution of Alcon Inc. (spin-off) to Novartis AG shareholders

[3] Other items: cost of goods sold, selling, general and administration, research and development and other expense include other restructuring charges and related items; research and development also includes amortization of option rights and the fair value adjustment of a contingent consideration liability; other income includes fair value adjustments on a financial asset; other expense also includes legal-related items

[4] Taxes on the adjustments between IFRS and core results take into account, for each individual item included in the adjustment, the tax rate that will finally be applicable to the item based on the jurisdiction where the adjustment will finally have a tax impact. Generally, this results in amortization and impairment of intangible assets and acquisition-related restructuring and integration items having a full tax impact. There is usually a tax impact on other items, although this is not always the case for items arising from legal settlements in certain jurisdictions. Due to these factors and the differing effective tax rates in the various jurisdictions, the tax on the total adjustments, excluding the non-taxable non-cash gain on the distribution (spin-off) of Alcon Inc. to Novartis AG shareholders of USD 279 million to arrive at the core results before tax amounts to USD 100 million. The 2019 core tax rate, excluding the effect of the gain on the distribution of Alcon Inc. to Novartis AG shareholders, is 17.5%.

[5] Earnings per share (EPS) is calculated on the amount of net income attributable to shareholders of Novartis AG.

5.B Liquidity and capital resources

The following tables summarize the Group's cash flows and net debt.

(USD millions)	2020	2019
Net cash flows from operating activities from continuing operations	13 650	13 547
Net cash flows from operating activities from discontinued operations		78
Net cash flows used in investing activities from continuing operations	– 13 055	– 1 067
Net cash flows used in investing activities from discontinued operations	– 127	– 1 159
Net cash flows used in financing activities from continuing operations	– 2 158	– 16 884
Net cash flows used in/from financing activities from discontinued operations	– 50	3 257
Effect of exchange rate changes on cash and cash equivalents	286	69
Net change in cash and cash equivalents	**– 1 454**	**– 2 159**
Change in marketable securities, commodities, time deposits and derivative financial instruments	1 571	– 2 359
Change in current and non-current financial debts and derivative financial instruments	– 8 660	4 764
Change in net debt	**– 8 543**	**246**
Net debt at January 1	– 15 938	– 16 184
Net debt at December 31	**– 24 481**	**– 15 938**

Cash flow

Financial year 2020 compared to 2019

Net cash flows from operating activities from continuing operations amounted to USD 13.6 billion, compared to USD 13.5 billion in 2019. This increase was mainly driven by higher net income adjusted for non-cash items and other adjustments, including divestment gains, partly offset by higher payments out of provisions related to legal matters.

Net cash outflows used in investing activities from continuing operations amounted to USD 13.1 billion, compared to USD 1.1 billion in 2019.

The current year cash outflows were mainly driven by USD 10.0 billion for acquisitions and divestments of businesses, net (including the acquisition of The Medicines Company for USD 9.5 billion, net of cash acquired USD 0.1 billion, and the acquisition of the Japanese business of Aspen Global Incorporated for USD 0.3 billion); USD 1.4 billion for net purchases of marketable securities and commodities; USD 1.3 billion for purchases of property, plant and equipment; and USD 1.3 billion for purchases of intangible assets. These cash outflows were partly offset by cash inflows of USD 0.7 billion from the sale of financial assets (including USD 0.3 billion proceeds from the sale of Alcon Inc. shares) and USD 0.4 billion from the sale of intangible assets.

In 2019, net cash flows used in investing activities from continuing operations were driven by USD 3.8 billion for acquisitions and divestments of businesses, net (including the acquisition of *Xiidra* from Takeda Pharmaceutical Company Limited for USD 3.5 billion and the acquisition of IFM Tre, Inc. for USD 0.3 billion); USD 1.4 billion for purchases of property, plant and equipment; USD 0.9 billion for purchases of intangible assets; and USD 0.4 billion for purchases of financial assets and other non-current assets. These cash outflows were partly offset by cash inflows of USD 2.3 billion from the net proceeds from the sale of marketable securities and commodities; USD 0.9 billion from the sale of property, plant and equipment (including the proceeds from the sale and leaseback of real estate); USD 1.2 billion from the sale of financial assets (including USD 1.0 billion proceeds from the sale of Alcon Inc. shares); and USD 1.0 billion from the sale of intangible assets.

Net cash flows used in investing activities from discontinued operations amounted to USD 0.1 billion compared to USD 1.2 billion in 2019. The current year includes payments for transaction related expenditures. In 2019, the net outflows were mainly driven by USD 0.3 billion for the acquisition of PowerVision, Inc.; USD 0.6 billion due to derecognized cash and cash equivalents following the completion of the Alcon spin-off, on April 9, 2019; and transaction related expenditures.

Net cash flows used in financing activities from continuing operations amounted to USD 2.2 billion, compared to USD 16.9 billion in 2019.

The current year cash outflows were driven by USD 7.0 billion for the dividend payment; USD 2.1 billion for net treasury share transactions; USD 2.0 billion for the repayment of two US dollar bonds at maturity; USD 0.3 billion net payments for lease liabilities; and USD 0.2 billion for other financing cash outflows, net. These cash outflows were partly offset by cash inflows of USD 7.1 billion from the increase in non-current financial debts, mainly consisting of USD 4.9 billion from the issuance of bonds denominated in US dollars (notional amount of USD 5.0 billion) and USD 2.1 billion from the issuance of a sustainability-linked bond denominated in euro (notional amount of EUR 1.85 billion); and USD 2.3 billion from the net increase in current financial debts.

In 2019, net cash flows used in financing activities from continuing operations were driven by USD 6.6 billion for the dividend payment; USD 5.3 billion for the net treasury share transactions (mainly related to the up-to USD 5 billion share buyback); USD 3.1 billion for net

non-current financial debts (mainly driven by the repayment at maturity of a US dollar bond of USD 3.0 billion); USD 1.6 billion for net repayments of current financial debts; and USD 0.3 billion for payments of lease liabilities, net.

Net cash flows used in financing activities from discontinued operations amounted to USD 50 million, compared to a cash inflow of USD 3.3 billion in 2019. The current year cash outflows are for transaction costs. In 2019, cash inflows included mainly proceeds from the USD 3.5 billion Alcon borrowings, partly offset by USD 0.2 billion payments for transaction costs.

Free cash flow

Free cash flow is a non-IFRS measure, see "Item 5.A Operating results—Non-IFRS measures as defined by Novartis—Free cash flow" above for further information.

The following table is a summary of the free cash flow:

(USD millions)	**2020**	2019
Operating income from continuing operations	**10 152**	**9 086**
Adjustments for non-cash items		
Depreciation, amortization and impairments	6 129	5 788
Change in provisions and other non-current liabilities	1 411	1 871
Other	260	– 476
Operating income adjusted for non-cash items	**17 952**	**16 269**
Dividends received from associated companies and others	490	463
Interest and other financial receipts	511	242
Interest and other financial payments	– 742	– 826
Taxes paid	– 1 833	– 1 876
Payments out of provisions and other net cash movements in non-current liabilities	– 2 437	– 924
Change in inventory and trade receivables less trade payables	– 730	– 809
Change in other net current assets and other operating cash flow items	439	1 008
Net cash flows from operating activities from continuing operations	**13 650**	**13 547**
Purchases of property, plant and equipment	– 1 275	– 1 379
Proceeds from sale of property, plant and equipment	88	857
Purchases of intangible assets	– 1 310	– 878
Proceeds from sale of intangible assets	380	973
Purchases of financial assets	– 230	– 302
Proceeds from sale of financial assets [1]	447	176
Purchases of other non-current assets	– 61	– 60
Proceeds from sale of other non-current assets	2	3
Free cash flow from continuing operations	**11 691**	**12 937**
Free cash flow from discontinued operations [2]		– 62
Total free cash flow	**11 691**	**12 875**

[1] For the free cash flow, proceeds from the sale of financial assets excludes the cash inflows from the sale of a portion of the Alcon Inc. shares received by certain consolidated foundations through the Alcon spin-off, which amounted to USD 276 million (2019: USD 976 million). See "Item 18. Financial Statements–Note 2. Significant transactions–Significant transactions in 2019."

[2] In 2019, the free cash flow from discontinued operations was a cash outflow of USD 62 million consisting of USD 78 million net cash inflows from operating activities from discontinued operations, USD 1.2 billion net cash flows used in investing activities from discontinued operations adjusted by USD 362 million of net cash outflows for acquisition and divestments of businesses and by USD 657 million for cash outflows attributable to the spin-off of the Alcon business.

Financial year 2020 compared to 2019

Free cash flow from continuing operations amounted to USD 11.7 billion (–10%) compared to USD 12.9 billion in 2019, as higher operating income adjusted for non-cash items was more than offset by payments related to legal matters and lower divestment proceeds.

Condensed consolidated balance sheets

(USD millions)	Dec 31, 2020	Dec 31, 2019
Assets		
Property, plant and equipment	12 263	12 069
Right-of-use assets	1 676	1 677
Goodwill	29 999	26 524
Intangible assets other than goodwill	36 809	28 787
Investments in associated companies	9 632	8 644
Deferred tax assets	8 214	7 909
Financial assets and other non-current assets	3 793	3 256
Total non-current assets	**102 386**	**88 866**
Inventories	7 131	5 982
Trade receivables	8 217	8 301
Other current assets and income tax receivable	2 762	2 934
Marketable securities, commodities, time deposits and derivative financial instruments	1 905	334
Cash and cash equivalents	9 658	11 112
Assets of disposal group held for sale		841
Total current assets	**29 673**	**29 504**
Total assets	**132 059**	**118 370**
Equity and liabilities		
Total equity	**56 666**	**55 551**
Liabilities		
Financial debts	26 259	20 353
Lease liabilities	1 719	1 703
Deferred tax liabilities	7 422	5 867
Provisions and other non-current liabilities	6 934	6 632
Total non-current liabilities	**42 334**	**34 555**
Trade payables	5 403	5 424
Financial debts and derivative financial instruments	9 785	7 031
Lease liabilities	286	246
Provisions and other current liabilities and current income tax liabilities	17 585	15 532
Liabilities of disposal group held for sale		31
Total current liabilities	**33 059**	**28 264**
Total liabilities	**75 393**	**62 819**
Total equity and liabilities	**132 059**	**118 370**

As of December 31, 2019, the assets and liabilities of the Sandoz US generic oral solids and dermatology businesses were reported as current assets and liabilities held for sale in the consolidated balance sheet. In March 2020, Novartis decided to retain the Sandoz US generic oral solids and dermatology businesses and, on April 2, 2020, announced the mutual agreement with Aurobindo to terminate the sale agreement. As such, these assets and liabilities are reclassified to their respective consolidated balance sheet lines as from March 31, 2020; the prior year consolidated balance sheet is not restated. For further details see "Item 18. Financial Statements—Note 2. Significant transactions—Significant transactions in 2020—Sandoz – retention of US dermatology business and generic US oral solids portfolio, previously planned to be divested."

Assets

Total non-current assets of USD 102.4 billion at December 31, 2020, increased by USD 13.5 billion compared to December 31, 2019.

Intangible assets other than goodwill increased by USD 8.0 billion mainly due to the acquisitions of The Medicines Company and of the Japanese business of Aspen Global Incorporated, net additions, favorable currency translation adjustments and the reclassification of the intangible assets of the disposal group held for sale of USD 0.3 billion, partially offset by amortization and impairments.

Goodwill increased by USD 3.5 billion, and deferred tax assets by USD 0.3 billion, mainly due to the acquisition of The Medicines Company and favorable currency translation adjustments.

Investments in associated companies increased by USD 1.0 billion primarily due to favorable currency trans-

lation adjustments, as income from associated companies was largely offset by dividends received.

Financial and other non-current assets increased by USD 0.5 billion, mainly due to fair value adjustments on financial assets.

Property, plant and equipment increased by USD 0.2 billion, mainly due to net additions and the reclassification of property, plant and equipment of the disposal group held for sale of USD 0.1 billion and favorable currency translation adjustments, partly offset by depreciation and impairments. Right-of-use assets were broadly in line with December 31, 2019.

Total current assets of USD 29.7 billion at December 31, 2020, increased by USD 0.2 billion compared to December 31, 2019.

Marketable securities, commodities, time deposits, and derivative financial instruments increased by USD 1.6 billion, mainly due to the investment of a portion of the September 16, 2020 issuance of the euro denominated sustainability-linked bond.

Inventories increased by USD 1.1 billion, which includes USD 0.2 billion from the reclassification of the inventory of the disposal group held for sale.

These increases were partly offset by a decrease in cash and cash equivalents by USD 1.5 billion, and in other current assets by USD 0.2 billion.

Trade receivables and income tax receivables were broadly in line with December 31, 2019.

We consider our provisions for doubtful trade receivables to be adequate. We continue to monitor the level of trade receivables, particularly in Argentina, Brazil, Greece, Italy, Portugal, Russia, Saudi Arabia, Spain and Turkey. Should there be a substantial deterioration in our economic exposure with respect to those countries, we may change the terms of trade on which we operate. The gross trade receivables from these countries at December 31, 2020, amounted to USD 1.5 billion (2019: USD 1.6 billion), of which USD 55 million is past due for more than one year (2019: USD 61 million), and for which provisions of USD 27 million have been recorded (2019: USD 24 million). At December 31, 2020, amounts past due for more than one year were not significant in any of these countries on a standalone basis. The majority of the outstanding trade receivables from Portugal, Saudi Arabia, Spain and Greece are due directly from local governments or government-funded entities.

The following table provides an overview of the aging analysis of total trade receivables and the total amount of the provision for doubtful trade receivables as of December 31, 2020 and 2019:

(USD millions)	**2020**	2019
Not overdue	7 714	7 763
Past due for not more than one month	150	161
Past due for more than one month but less than three months	118	123
Past due for more than three months but less than six months	102	103
Past due for more than six months but less than one year	77	96
Past due for more than one year	149	150
Provisions for doubtful trade receivables	– 93	– 95
Total trade receivables, net	**8 217**	**8 301**

There is also a risk that certain countries could devalue their currency. Currency exposures are described in more detail in "—Effects of currency fluctuations."

Liabilities

Total non-current liabilities of USD 42.3 billion increased by USD 7.8 billion compared to December 31, 2019.

Non-current financial debts increased by USD 5.9 billion, mainly driven by the issuance of a euro denominated sustainability-linked bond for a notional amount of EUR 1.85 billion (USD 2.2 billion), and the issuance of US dollar denominated bonds for a total notional amount of USD 5.0 billion.

This increase was partly offset by the reclassification from non-current to current financial debt for a total of USD 2.3 billion consisting of a EUR 1.25 billion (USD 1.5 billion) bond and a EUR 0.6 billion (USD 0.7 billion) bond due in March 2021 and November 2021, respectively.

Deferred tax liabilities increased by USD 1.6 billion mainly due to the acquisition of The Medicines Company.

Provisions and other non-current liabilities increased by USD 0.3 billion, and lease liabilities were broadly in line compared to December 31, 2019.

Total current liabilities of USD 33.1 billion increased by USD 4.8 billion compared to December 31, 2019.

Current financial debts and derivative financial instruments increased by USD 2.8 billion, due to the reclassification from non-current to current financial debt of USD 2.3 billion and higher short-term borrowings, partly offset by the repayment at maturity of two US dollar bonds totaling USD 2.0 billion.

Provisions and other current liabilities increased by USD 1.8 billion mainly due to a USD 1.8 billion treasury share repurchase obligation under a share buyback trading plan and current income tax liabilities increased by USD 0.3 billion.

Trade payables and lease liabilities were broadly in line compared to December 31, 2019.

In our key countries, Switzerland and the United States, assessments have been agreed by the tax authorities up to 2015 in Switzerland and 2014 in the United States, respectively, with the exception of one open United States position related to the 2007 tax filing. In addition, a subsidiary in France, acquired with the AAA acquisition, has an open position related to the tax years 2014 and 2015. Uncertainties also exist on the application of a German non-resident tax regulation for license or capital gains income derived from German registered intellectual property rights.

Novartis believes that its total provisions are adequate based upon currently available information. However, given the inherent difficulties in estimating liabilities in this area, Novartis may incur additional costs beyond the amounts provided. Management believes that such additional amounts, if any, would not be material to the Group's financial condition but could be material to the results of operations or cash flows in a given period.

Equity

The Group's equity increased by USD 1.1 billion to USD 56.7 billion at December 31, 2020 compared to December 31, 2019.

This increase was mainly due to the net income of USD 8.1 billion, the net effect of the exercise of options

and employee transactions of USD 0.8 billion, equity-based compensation of USD 0.7 billion, favorable currency translation differences of USD 3.2 billion and the net favorable fair value adjustments on financial instruments of USD 0.3 billion.

This was partly offset by the cash-dividend payment of USD 7.0 billion, purchase of treasury shares of USD 3.1 billion and the increase of the treasury share repurchase obligation of USD 1.8 billion.

Summary of equity movements attributable to Novartis AG shareholders

	Number of outstanding shares (in millions)		Equity attributable to Novartis AG shareholders	
	2020	2019	**2020 USD millions**	2019 USD millions
Balance at beginning of year	**2 265.0**	**2 311.2**	**55 474**	**78 614**
Impact of change in accounting policy [1]				3
Restated equity at January 1			**55 474**	**78 617**
Shares acquired to be canceled	– 32.6	– 60.3	– 2 897	– 5 351
Other share purchases	– 1.7	– 1.7	– 159	– 160
Exercise of options and employee transactions	14.7	5.5	806	210
Repurchase of options			– 89	
Equity-based compensation	11.0	9.4	730	833
Shares delivered to Alcon employees as a result of the Alcon spin-off	0.4	0.9	30	18
Taxes on treasury share transactions [2]			32	– 189
(Increase)/decrease of treasury share repurchase obligation under a share buyback trading plan			– 1 769	284
Transaction costs, net of taxes [3]				– 253
Dividends			– 6 987	– 6 645
Dividend in kind to effect the spin-off of Alcon Inc. [4]				– 23 434
Net income of the year attributable to shareholders of Novartis AG			8 072	11 732
Other comprehensive income attributable to shareholders of Novartis AG			3 331	– 207
Impact of change in ownership of consolidated entities			6	– 3
Other movements [5]			18	22
Balance at end of year	**2 256.8**	**2 265.0**	**56 598**	**55 474**

[1] In 2019, the impact of change in accounting policy includes USD 3 million related to the implementation of IFRS 16 Leases (see "Item 18. Financial Statements—Note 1. Significant accounting policies").
[2] Included in 2019 is a USD 69 million impact related to the revaluation of deferred tax liability on treasury shares. This revaluation resulted from the Swiss federal tax reform enacted in May 2019 (see "Item 18. Financial Statements—Note 12. Deferred tax assets and liabilities").
[3] In 2019 transaction costs, net of tax of USD 36 million, directly attributable to the distribution (spin-off) of Alcon to Novartis shareholders (see "Item 18. Financial Statements—Note 1. Significant accounting policies").
[4] Included in 2019 is the fair value of the dividend in kind of Alcon Inc. shares to Novartis AG shareholders and ADR (American Depositary Receipt) holders approved at the 2019 Annual General Meeting held on February 28, 2019. Distribution was effected on April 8, 2019, whereby each Novartis AG shareholder and ADR holder received one Alcon Inc. share for every five Novartis AG shares/ADRs they held on April 8, 2019, close of business (see "Item 18. Financial Statements—Note 1. Significant accounting policies").
[5] Impact of hyperinflationary economies (see "Item 18. Financial Statements—Note 1. Significant accounting policies").

In 2020, Novartis repurchased a total of 32.6 million shares for USD 2.9 billion on the SIX Swiss Exchange second trading line, including 8.0 million shares (USD 0.7 billion) bought back under the up-to USD 2.5 billion share buyback announced in November 2020, and 24.6 million shares (USD 2.2 billion) to mitigate dilution related to participation plans of associates. In addition, 1.7 million shares (USD 0.2 billion) were repurchased from associates. In the same period, 26.1 million shares (for an equity value of USD 1.5 billion) were delivered as a result of options exercised and share deliveries related to participation plans of associates. Consequently, the total number of shares outstanding decreased by 8.2 million versus December 31, 2019. These treasury share transactions resulted in a decrease in equity of USD 1.6 billion and a net cash outflow of USD 2.1 billion including the benefit from net option proceeds.

In 2019, Novartis repurchased a total of 60.3 million shares for USD 5.4 billion on the SIX Swiss Exchange second trading line, including 46.5 million shares (USD 4.2 billion) bought back under the up-to USD 5 billion share buyback announced in June 2018, and 13.8 million shares (USD 1.1 billion) to mitigate dilution related to participation plans of associates. In addition, 1.7 million shares (USD 0.2 billion) were repurchased from associates. In the same period, 15.8 million shares (for an equity value of USD 1.1 billion) were delivered as a result of options exercised and share deliveries related to participation plans of associates. Consequently, the total number of shares outstanding decreased by 46.2 million versus December 31, 2018. These treasury share transactions resulted in a decrease in equity of USD 4.5 billion and a net cash outflow of USD 5.3 billion.

Treasury shares

At December 31, 2020, our holding of treasury shares amounted to 210.2 million shares, or approximately 9% of the total number of issued shares. Approximately 103

million treasury shares were held in entities that restrict their availability for use.

At December 31, 2019, our holding of treasury shares amounted to 262.3 million shares, or approximately 10% of the total number of issued shares. Approximately 118 million treasury shares were held in entities that restrict their availability for use.

Effects of currency fluctuations

We transact our business in many currencies other than the US dollar, our reporting currency.

The following table provides an overview of net sales and operating expenses for our continuing operations based on IFRS values for 2020 and 2019, for currencies most important to the Group:

	2020		2019	
Currency	Net sales %	Operating expenses %[1]	Net sales %	Operating expenses %[1]
US dollar (USD)	36	34	37	36
Euro (EUR)	29	27	28	26
Swiss franc (CHF)	2	18	2	16
Japanese yen (JPY)	6	3	6	3
Chinese yuan (CNY)	5	3	5	4
Canadian dollar (CAD)	3	1	3	2
British pound (GBP)	2	3	2	2
Brazilian real (BRL)	2	1	2	1
Russian ruble (RUB)	2	1	2	1
Australian dollar (AUD)	1	1	1	1
Other currencies	12	8	12	8

[1] Operating expenses include cost of goods sold; selling, general and administration; research and development; other income and other expense.

We prepare our consolidated financial statements in US dollars. As a result, fluctuations in the exchange rates between the US dollar and other currencies can have a significant effect on both the Group's results of operations as well as the reported value of our assets, liabilities and cash flows. This in turn may significantly affect reported earnings (both positively and negatively) and the comparability of period-to-period results of operations.

For purposes of our consolidated balance sheets, we translate assets and liabilities denominated in other currencies into US dollars at the prevailing market exchange rates as of the relevant balance sheet date. For purposes of the Group's consolidated income and cash flow statements, revenue, expense and cash flow items in local currencies are translated into US dollars at average exchange rates prevailing during the relevant period. As a result, even if the amounts or values of these items remain unchanged in the respective local currency, changes in exchange rates have an impact on the amounts or values of these items in our consolidated financial statements.

Because our expenditure in Swiss francs is significantly higher than our revenue in Swiss francs, volatility in the value of the Swiss franc can have a significant impact on the reported value of our earnings, assets and liabilities, and the timing and extent of such volatility can be difficult to predict.

There is also a risk that certain countries could devalue their currency. If this occurs, it could impact the effective prices we would be able to charge for our products and also have an adverse impact on both our consolidated income statement and balance sheet.

Subsidiaries whose functional currencies have experienced a cumulative inflation rate of more than 100% over the past three years apply the rules of IAS 29 "Financial Reporting in Hyperinflationary Economies." Gains and losses incurred upon adjusting the carrying amounts of non-monetary assets and liabilities for inflation are recognized in the income statement. The hyperinflationary economies in which Novartis operates are Argentina and Venezuela. Venezuela was hyperinflationary for all years presented, and Argentina became hyperinflationary effective July 1, 2018, requiring retroactive implementation of hyperinflation accounting as of January 1, 2018. The impacts from applying IAS 29 were not significant.

The Group manages its global currency exposure by engaging in hedging transactions where management deems appropriate, after taking into account the natural hedging afforded by our global business activity. For 2020, we entered into various contracts that change in value with movements in foreign exchange rates, to preserve the value of assets, commitments and expected transactions. We use forward contracts and foreign currency options to hedge. For more information on how these transactions affect our consolidated financial statements and on how foreign exchange rate exposure is managed, see "Item 18. Financial Statements—Note 1. Significant accounting policies," "Item 18. Financial Statements—Note 5. Interest expense and other financial income and expense," "Item 18. Financial Statements—Note 15. Trade receivables," "Item 18. Financial Statements—Note 28. Commitments and contingencies" and "Item 18. Financial Statements—Note 29. Financial instruments – additional disclosures."

The following table sets forth the foreign exchange rates of the US dollar against key currencies used for foreign currency translation when preparing the Group's consolidated financial statements:

	Average for year			Year-end		
USD per unit	**2020**	2019	Change in %	**2020**	2019	Change in %
Australian dollar (AUD)	0.690	0.695	– 1	0.771	0.701	10
Brazilian real (BRL)	0.196	0.254	– 23	0.193	0.249	– 22
Canadian dollar (CAD)	0.746	0.754	– 1	0.784	0.767	2
Swiss franc (CHF)	1.066	1.006	6	1.135	1.032	10
Chinese yuan (CNY)	0.145	0.145	0	0.153	0.144	6
Euro (EUR)	1.141	1.120	2	1.229	1.121	10
British pound (GBP)	1.283	1.277	0	1.365	1.313	4
Japanese yen (JPY (100))	0.937	0.918	2	0.970	0.920	5
Russian ruble (RUB (100))	1.389	1.546	– 10	1.337	1.613	– 17

The following table provides a summary of the currency impact on key Group figures due to their conversion into US dollars, the Group's reporting currency, of the financial data from entities reporting in non-US dollars. Constant currency (cc) calculations apply the exchange rates of the prior year to the current-year financial data for entities reporting in non-US dollars.

Currency impact on key figures

	Change in USD % 2020	Change in constant currencies % 2020	Percentage point currency impact 2020	Change in USD % 2019	Change in constant currencies % 2019	Percentage point currency impact 2019
Total Group – Continuing operations						
Net sales to third parties	3	3	0	6	9	– 3
Operating income	12	19	– 7	8	14	– 6
Net income	13	20	– 7	– 44	– 41	– 3
Basic earnings per share (USD)	14	21	– 7	– 43	– 40	– 3
Core operating income	9	13	– 4	12	17	– 5
Core net income	9	12	– 3	11	15	– 4
Core basic earnings per share (USD)	9	13	– 4	12	17	– 5
Innovative Medicines						
Net sales to third parties	3	4	– 1	8	11	– 3
Operating income	– 1	4	– 5	18	24	– 6
Core operating income	8	11	– 3	13	18	– 5
Sandoz						
Net sales to third parties	– 1	0	– 1	– 1	2	– 3
Operating income	89	106	– 17	– 59	– 53	– 6
Core operating income	11	15	– 4	5	10	– 5
Corporate						
Operating loss	nm	nm	nm	6	4	2
Core operating loss	11	14	– 3	– 6	– 9	3

nm = not meaningful

For additional information on the effects of currency fluctuations, see "Item 18. Financial Statements—Note 29. Financial instruments – additional disclosures."

Group liquidity, financial debts and net debt

The following table shows Group liquidity, financial debts and net debt:

(USD millions)	2020	2019
Non-current financial debts	– 26 259	– 20 353
Current financial debts and derivative financial instruments	– 9 785	– 7 031
Total financial debts	**– 36 044**	**– 27 384**
Less liquidity		
Cash and cash equivalents	9 658	11 112
Marketable securities, commodities, time deposits and derivative financial instruments	1 905	334
Total liquidity	**11 563**	**11 446**
Net debt at December 31 [1]	**– 24 481**	**– 15 938**

[1] For further information about the net debt measure, which is a non-IFRS measure, see "Item 5.A Operating results—Non-IFRS measures as defined by Novartis—Net debt".

Financial year 2020

Group net debt at December 31, 2020, increased to USD 24.5 billion, compared to USD 15.9 billion at December 31, 2019.

Total financial debts increased by USD 8.7 billion to USD 36.0 billion at December 31, 2020. Non-current financial debts increased by USD 5.9 billion, mainly driven by the issuance of a euro denominated sustainability-linked bond for a notional amount of EUR 1.85 billion (USD 2.2 billion), and the issuance of US dollar denominated bonds for a total notional amount of USD 5.0 billion. This increase was partly offset by the reclassification from non-current to current financial debt for a total of USD 2.3 billion consisting of a EUR 1.25 billion (USD 1.5 billion) bond and a EUR 0.6 billion (USD 0.7 billion) bond due in March 2021 and November 2021, respectively.

Current financial debts and derivative financial instruments increased by USD 2.8 billion, due to the reclassification from non-current to current financial debt of USD 2.3 billion and higher short-term borrowings, partly offset by the repayment at maturity of two US dollar bonds totaling USD 2.0 billion.

Novartis has two US commercial paper programs under which it can issue up to USD 9.0 billion in the aggregate of unsecured commercial paper notes. Novartis also has a Japanese commercial paper program under which it can issue up to JPY 150 billion (approximately USD 1.5 billion) of unsecured commercial paper notes. Commercial paper notes totaling USD 4.3 billion under these three programs were outstanding as per December 31, 2020 (2019: USD 2.3 billion).

Novartis also has a committed credit facility of USD 6.0 billion, which was renewed in 2019. This credit facility is provided by a syndicate of banks and is intended to be used as a backstop for the US commercial paper programs. The renewed facility matures in September 2024 and was undrawn as per December 31, 2020, and December 31, 2019.

As of year-end 2020, Moody's Investors Service rated the Company A1 for long-term maturities and P-1 for short-term maturities and S&P Global Ratings rated the company AA- for long-term maturities and A-1+ for short-term maturities.

For the tables showing the maturity schedule of our current financial assets, current and non-current financial debts and net debt at December 31, 2020 and December 31, 2019 see "Item 18. Financial Statements–Note 29. Financial instruments – Additional disclosures—Nature and extent of risks arising from financial instruments—Liquidity risk."

For a description of risks and restrictions on the ability of subsidiaries to transfer funds to the Company via cash dividends, loan or advances please see "Item 5.B Liquidity and capital resources—Group liquidity, financial debts and net debt–Liquidity/short-term funding" and "Item 18. Financial Statements—Note 29. Financial instruments – Additional disclosures—Nature and extent of risks arising from financial instruments."

Information regarding the Company's material commitments for capital expenditures as of the end of 2020 and 2019 and an indication of the general purpose of such commitments and the anticipated sources of funds needed to fulfill such commitments are provided in "Item 5.F Tabular disclosure of contractual obligations."

Liquidity and financial debt by currency

The following table provides a breakdown of liquidity and financial debt by currency as of December 31:

	Liquidity in % 2020[1]	Liquidity in % 2019[1]	**Financial debt in % 2020**[2]	Financial debt in % 2019[2]
USD	57	72	55	53
CHF	11	14	10	12
EUR	23	7	30	29
JPY		1	2	3
Other	9	6	3	3
	100	**100**	**100**	**100**

[1] Liquidity includes cash and cash equivalents, marketable securities, commodities and time deposits.
[2] Financial debt includes non-current and current financial debt.

Bonds

In February 2020, a 3-year USD bond of USD 1.0 billion with a coupon of 1.80% was repaid at maturity.

In February 2020, four US dollar bonds totaling USD 5.0 billion were issued: a 5-year bond of USD 1.0 billion with a coupon of 1.75%, a 7-year bond of USD 1.25 billion with a coupon of 2.00%, a 10-year bond of USD 1.5 billion with a coupon of 2.20%, and a 30-year bond of USD 1.25 billion with a coupon of 2.75%.

In April 2020, a 10-year USD bond of USD 1.0 billion with a coupon of 4.40% was repaid at maturity.

In September 2020, an 8-year euro sustainability-linked bond of EUR 1.85 billion with a coupon of 0.00% was issued.

In February 2019, a 10-year USD bond of USD 3.0 billion with a coupon of 5.125% was repaid at maturity.

Liquidity/short-term funding

The Group's liquidity amounted to USD 11.6 billion at December 31, 2020, compared to USD 11.4 billion at December 31, 2019. Total non-current and current financial debts, including derivatives, amounted to USD 36.0 billion at December 31, 2020, compared to USD 27.4 billion at December 31, 2019.

The debt/equity ratio increased to 0.64:1 at December 31, 2020, compared to 0.49:1 at December 31, 2019. The net debt increased to USD 24.5 billion at December 31, 2020, compared to USD 15.9 billion at December 31, 2019.

We continuously track our liquidity position and asset/liability profile. This involves modeling cash flow maturity profiles based on both historical experiences and contractual expectations to project our liquidity requirements. We seek to preserve prudent liquidity and funding capabilities. We are confident that we have sufficient liquidity to support our normal business activities for the foreseeable future.

Certain countries have legal or economic restrictions on the ability of subsidiaries to transfer funds to the Group in the form of cash dividends, loans or advances, but these restrictions do not have an impact on the ability of the Group to meet its cash obligations.

We are not aware of any significant demands to change the level of liquidity needed to support our normal business activities. We make use of various borrowing facilities provided by several financial institutions. We also successfully issued various bonds in previous years (including 2018), and raised funds through our commercial paper programs.

The maturity schedule of our net debt can be found in "Item 18. Financial Statements–Note 29. Financial instruments –Additional disclosures—Nature and extent of risks arising from financial instruments—Liquidity risk."

5.C Research and development, patents and licenses

Our research and development spending from continuing operations totaled USD 9.0 billion and USD 9.4 billion (Core research and development USD 8.5 billion and USD 8.4 billion) for the years 2020 and 2019, respectively.

Each of our divisions has its own research and development and patent policies. Our divisions have numerous products in various stages of development. For further information on these policies and these products in development, see "Item 4. Information on the Company—Item 4.B Business overview."

As described in the risk factors section and elsewhere in this Annual Report, our drug development efforts are subject to the risks and uncertainties inherent in any new drug development program. Due to the risks and uncertainties involved in progressing through preclinical development and clinical trials, and the time and cost involved in obtaining regulatory approvals, among other factors, we cannot reasonably estimate the timing, completion dates and costs, or range of costs, of our drug development programs, or of the development of any particular development compound (see "Item 3. Key Information—Item 3.D Risk factors"). In addition, for a description of the research and development process for the development of new drugs and our other products, and the regulatory process for their approval, see "Item 4. Information on the Company—Item 4.B Business overview."

5.D Trend information

Please see "—Item 5.A Operating results", "—Item 5.B Liquidity and capital resources" and "Item 4. Information on the Company—Item 4.B Business overview" for trend information.

5.E Off-balance sheet arrangements

We have no unconsolidated special purpose financing or partnership entities or other off-balance sheet arrangements that have or are reasonably likely to have a current or future effect on our financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources, that is material to investors. See also "Item 18. Financial Statements—Note 28. Commitments and contingencies," and matters described in "— Item 5.F Tabular disclosure of contractual obligations."

5.F Tabular disclosure of contractual obligations

The following table summarizes the Group's contractual obligations and other commercial commitments, as well as the effect these obligations and commitments are expected to have on the Group's liquidity and cash flow in future periods:

	Payments due by period				
(USD millions)	Total	Less than 1 year	2–3 years	4–5 years	After 5 years
Non-current financial debt, including current portion	**28 531**	2 272	5 177	5 444	15 638
Interest on non-current financial debt, including current portion	**6 647**	550	1 014	832	4 251
Lease liabilities, non-current and current portion	**2 005**	286	415	277	1 027
Interest on lease liabilities, non-current and current portion	**1 502**	52	85	66	1 299
Unfunded pensions and other post-employment benefit plans	**1 760**	93	190	191	1 286
Research and development potential milestone commitments	**5 232**	449	1 016	764	3 003
Contingent consideration liabilities	**1 046**	62	327	312	345
Property, plant and equipment purchase commitments	**256**	223	29		4
Acquisition of business commitments	**235**	210	7		18
Research and development commitments on transactions entered into but not closed in 2020 [1]	**3 296**	549	408	930	1 409
Total contractual cash obligations	**50 510**	**4 746**	**8 668**	**8 816**	**28 280**

[1] For research and development commitments on transactions entered into but not closed in 2020, please refer to "Item 18. Financial Statements – Note 28 Commitments and contingencies – research and development commitments".

The Group intends to fund the research and development; property, plant and equipment; intangible asset purchase commitments with internally generated resources, and the acquisition of business commitment through available cash and short- and long-term borrowings.

For other contingencies, see "Item 8. Financial Information—Item 8.A Consolidated statements and other financial information," "Item 18. Financial Statements — Note 10. Right-of-use assets and lease liabilities," "Item 18. Financial Statements—Note 20. Provisions and other non-current liabilities," and "Item 18. Financial Statements—Note 28. Commitments and contingencies."

Item 6. Directors, Senior Management and Employees

6.A Directors and senior management

The information set forth under "Item 6. Directors, Senior Management and Employees—Item 6.C Board practices—Corporate governance—Board of Directors" and "Item 6. Directors, Senior Management and Employees—Item 6.C Board practices—Corporate governance—Executive Committee" is incorporated by reference.

6.B Compensation

Dear shareholder,

I am pleased to share with you the 2020 Compensation Report of Novartis AG. It follows a similar structure to the previous year's report, which was supported by over 92% of shareholders.

From the 2020 Annual General Meeting (AGM), we welcomed new member Bridgette Heller and permanent guest Simon Moroney to the Compensation Committee. I have been grateful for their contributions during the year. In addition, I would like to express my sincere gratitude to Srikant Datar, who will step down from the Compensation Committee at the 2021 AGM, for his valuable engagement throughout his tenure with the Committee.

Feedback from shareholders prior to our last AGM and, more recently, toward the end of 2020 suggested that shareholders were in agreement that our current compensation system is aligned with the Company's purpose, strategy and culture. No changes are therefore proposed for 2021.

COVID-19 pandemic

During 2020, Novartis navigated the pandemic well. We increased our focus on associates' health and well-being by implementing a number of support programs, including additional paid leave, childcare assistance during school closures, a one-time payment for home office setup, a new flexible working scheme within the country of employment, and a one-time payment to associates and external contractors required to work on site (i.e., in our laboratories or our manufacturing units). No government assistance (e.g., subsidies, furloughs) was sought by the Company, and no COVID-19-related associate redundancies were made. Through these actions, we were able to minimize the disruption to our business operations and consequently were in a position to commit to making no changes to our dividend policy for 2021.

To help tackle the issues caused by the pandemic directly, Novartis made a number of commitments, collaborating with healthcare peers and other organizations on anti-COVID-19 programs, including the rollout of treatments to the developing world. More information on Novartis response efforts can be found in our Novartis in Society ESG Report 2020.

2020 Company performance

Financial performance in 2020 was solid despite the impact of the global pandemic. Net sales to third parties for Novartis continuing operations grew 3% in reported terms and 3% measured in constant currencies (cc), which removes the impact of exchange rate movements. Growth was mainly driven by *Cosentyx* (USD 4.0 billion in sales), *Entresto* (USD 2.5 billion), *Promacta/Revolade* (USD 1.7 billion), and *Zolgensma* (USD 0.9 billion). Other recently launched products, including *Kisqali*, *Piqray* and *Kymriah*, also contributed. However, this was below our ambitious net sales plan, as COVID-19 weighed on certain therapeutic areas, most notably dermatology and ophthalmology, and the Sandoz Retail Generics business. The safety updates on *Beovu* also impacted the business.

Operating income grew 19% versus the prior year (cc), and net income grew 20% versus the prior year (cc). Core operating income grew 13% versus the prior year (cc), exceeding the target, driven by improved productivity in marketing and sales as well as research and development, and Novartis Technical Operations (NTO) network transformation initiatives. Core operating income margin increased to 31.7% (+2.8 percentage points cc versus the prior year, and +1.5 percentage points cc versus target), with Innovative Medicines core margin reaching 35%.

Free cash flow amounted to USD 11.7 billion. The target, as a percentage of sales, was slightly overachieved due to continued strong cash collection despite higher legal fee payouts.

Financial performance determines 60% of the CEO's Annual Incentive balanced scorecard. Targets for the financial measures were set at the start of the year, and the Compensation Committee determined that it would not adjust or apply upwards discretion to reflect the negative impact of the pandemic or settlements of legacy legal cases. Overall, our aforementioned performance resulted in achievement meeting target for this element of the Annual Incentive.

Strategic objectives determine the remaining 40% of the CEO's Annual Incentive balanced scorecard. Progress against these objectives resulted in achievement meeting target for this element of the CEO's Annual Incentive. More details on our strategic objectives as well as our financial performance can be found in "—2020 CEO balanced scorecard."

Two of the five strategic objectives in the CEO's Annual Incentive balanced scorecard relate to environmental, social and governance (ESG) matters: "people and culture" and "building trust with society." We continue to integrate ESG, a priority for the Novartis Board of Directors and the Executive Committee, across our operations. Novartis focuses on four strategic ESG pillars: ethical standards, pricing and access, global health challenges and corporate citizenship. In addition to the COVID-19-related efforts previously mentioned, particular achievements in 2020 included:

- Setting ambitious long-term environmental targets for our entire supply chain
- Increasing our patient reach in low- and middle-income countries with emerging market brands and flagship programs (i.e., Chagas disease, leprosy, malaria and sickle cell disease)
- Continuing to make great progress on our diversity and inclusion strategy related to gender balance, LGBTI equity, disability equity, and race and ethnicity
- Issuing a sustainability-linked bond, the first of its kind in the healthcare industry
- Launching our new Code of Ethics

Significant upgrades from ESG rating agencies such as MSCI and Sustainalytics in the latest reporting season were based on closing compliance-related allegations; strong governance, including extensive ethics policies; leading programs to expand access to healthcare for low-income populations; and a comprehensive employee engagement strategy relative to peers.

2020 realized compensation

Based on the overall balanced scorecard assessment meeting target, the Board of Directors decided on an Annual Incentive resulting in a payout for the CEO amounting to CHF 2 636 550, which is 100% of target, within the range of 0–200%.

The 2018-2020 Long-Term Incentive (LTI) plans comprise the Long-Term Performance Plan (LTPP) and the Long-Term Relative Performance Plan (LTRPP). The 2018-2020 LTPP delivered strong results. The Cash Value Added target – which has continued to increase for the last three cycles – was exceeded, and innovation was above target. For the 2018-2020 LTRPP, Novartis was above median, ranking 7 out of a total of 15 global healthcare peers (including Novartis) on three-year relative total shareholder return (TSR). Overall, when considering both plans, the Board of Directors awarded the CEO a total LTI payout of CHF 8 054 923, corresponding to a 126% payout against a maximum of 200%.

No Annual Incentive or LTI targets were adjusted as a result of the pandemic.

The Board determined that no adjustments were required to the incentive payouts, notwithstanding the Company's supportive treatment of associates and ability to adapt to new ways of working throughout the pandemic, without government assistance or making any COVID-19-related redundancies. In addition, Novartis is committing to a 2021 dividend to shareholders, in line with its policy.

These incentive performance outcomes, combined with base salary and other benefits, pension, Alcon Keep Whole awards and dividend equivalents, resulted in 2020 total realized compensation for the CEO of CHF 12 724 166.

The higher total realized compensation for the CEO compared to 2019 can be attributed to the vesting of his first LTI granted after his promotion to CEO in 2018.

The 2020 total realized compensation for the Executive Committee members (comprising the CEO and the other 12 active Executive Committee members) was CHF 58 819 813. This is lower than the prior year due to the reduction in members reported (two members stepped down and were replaced in 2019, whereas no members stepped down in 2020). For more detail on the 2020 realized pay for the CEO and ECN members, please see "—2020 realized compensation for the CEO and other Executive Committee members."

Board compensation

In 2020, the Compensation Committee reviewed, with its independent advisor, the Board of Directors' compensation system against the Swiss Market Index. Additional information on our Board benchmarking practices is provided in "—2020 Board compensation."

They found that the Chairman and retainer fees of the other Board members are well positioned and competitive among the benchmarked companies in relation to the Company's size, operational complexity and corporate headquarters location. The Compensation Committee therefore proposed no changes to the Board of Directors' fees for the 2021-2022 AGM.

2021 AGM

In line with our Articles of Incorporation, at the 2021 AGM, shareholders will be asked to approve, in a binding vote, the maximum aggregate amount of compensation for the Board of Directors from the 2021 AGM to the 2022 AGM, and the maximum aggregate amount of compensation for the Executive Committee for the financial year 2022. Shareholders will also be asked to endorse this Compensation Report in an advisory vote.

This will be my last year as Chairman of the Compensation Committee of the Board of Directors, and I would like to thank you all for your support throughout my nine-year tenure. I will stand for election as a member of our Compensation Committee at the 2021 AGM to ensure a smooth transition to my successor. We will also ask shareholders to elect Simon Moroney to the Compensation Committee and, if support is received, the Board of Directors will then appoint him as the new Chairman of the Compensation Committee.

On behalf of Novartis and the Compensation Committee, I would like to thank you for your continued engagement and feedback, which we consider extremely valuable in driving improvements in our compensation systems and practices.

Respectfully,

Enrico Vanni, Ph.D.
Chairman of the Compensation Committee

Compensation at a glance

Executive Committee compensation system

	2020 fixed pay and benefits		Performance-related variable pay		
	Annual base salary	Pension and other benefits	2020 Annual Incentive	Long-Term Incentive awards cycle 2018-2020	
				LTPP[1]	LTRPP[2]
Purpose	Reflects responsibilities, experience and skill sets	Provides retirement and risk insurances (tailored to local market practices/regulations)	Rewards for performance against short-term financial and strategic objectives, and Values and Behaviors	Rewards long-term shareholder value creation and innovation in line with our strategy	
Form of payment	Cash	Country/individual-specific and aligned with other employees	50% cash 50% equity[3] deferred for three years	Equity, vesting following a three-year performance period	
Performance measures	–	–	Balanced scorecard comprising: • Financial measures (60%) • Strategic objectives[4] (40%)	• Novartis Cash Value Added (75%) • Innovation milestones (25%)	• Relative TSR versus global sector peers (100%)[5]

[1] LTPP = Long-Term Performance Plan
[2] LTRPP = Long-Term Relative Performance Plan
[3] Executive Committee members may elect to receive more of their Annual Incentive in equity instead of cash.
[4] Strategic objectives are aligned with the five strategic pillars: innovation, operational excellence, data and digital, people and culture, and building trust with society.
[5] For the 2018-2020 performance cycle, the peer group comprises 15 global healthcare companies, including Novartis, as listed in "—Approach to market benchmarking."

Target incentive opportunity levels for the CEO are 150% and 325% of base salary for the Annual Incentive and LTI, respectively. Based on Novartis compensation guidelines, the other members of the Executive Committee have Annual Incentive and LTI target opportunity levels that range from 80% to 120%, and 160% to 270% of base salary, respectively. The payout range remains at 0% to 200% of target opportunity based on achievement against performance.

The 2018-2020 cycle will be the last vesting of the LTRPP plan, which was discontinued as of grants made in 2019. The LTPP metrics were subsequently transformed into four equally weighted measures: net sales compound annual growth rate, core operating income compound annual growth rate, innovation and relative TSR.

Compensation governance at a glance

A summary of the compensation decision authorization levels within the parameters set by the AGM is shown below, along with an overview of the risk management principles.

DECISION ON	DECISION-MAKING AUTHORITY
Compensation of Chairman and other Board members	Board of Directors
Compensation of CEO	Board of Directors
Compensation of other Executive Committee members	Compensation Committee

EXECUTIVE COMMITTEE COMPENSATION RISK MANAGEMENT PRINCIPLES

- Rigorous performance management process
- Balanced mix of short-term and long-term variable compensation elements
- Performance evaluation under the Annual Incentive includes an individual balanced scorecard
- Performance-based LTI, with three-year cycles
- All variable compensation is capped at 200% of target
- Contractual notice period of 12 months
- Post-contractual non-compete period limited to a maximum of 12 months from the end of employment. Resulting compensation is limited to the annual base salary plus the prior-year Annual Incentive as per contract, if applicable
- Good and bad leaver provisions apply to the variable compensation of leavers
- No severance payments or change-of-control clauses
- Clawback and malus principles apply to all elements of variable compensation
- Share ownership requirements; no hedging or pledging of Novartis share ownership position

2020 CEO pay for performance – outcomes

Measure	Target[1]	Achievement versus target
2020 ANNUAL INCENTIVE (SEE "—2020 ANNUAL INCENTIVE")		
Financial measures – 60% of total Annual Incentive, comprising:		
Group net sales (cc) (30%)	USD 50 781 million	Below
Group operating income (cc) (30%)	USD 9 745 million	Significantly above
Group free cash flow as a % of sales (cc) (20%)	24.3%	Above
Share of peers for Novartis Group (USD) (20%)	8.3%	Met
Overall assessment of Group financial targets in constant currencies		**Met**

[1] For performance evaluation purposes, target as well as actual financial KPIs included the results of the Sandoz US dermatology business and generic oral solids portfolio, which were expected to be divested to Aurobindo Pharma USA Inc. This deal was later terminated by mutual agreement with Aurobindo.

Strategic objectives – 40% of total Annual Incentive, comprising:		
Innovation (20%)		Met
Operational excellence (20%)		Met
Data and digital (20%)		Met
People and culture (including Values and Behaviors) (20%)		Met
Building trust with society (including access to healthcare, reputation and other ESG topics) (20%)		Significantly above
Overall assessment of strategic objectives		**Met**
Overall assessment of CEO balanced scorecard		**Met**
TOTAL Annual Incentive:		**100% of target (payout range 0% – 200%)**
2018-2020 LONG-TERM INCENTIVES (SEE "— LONG-TERM INCENTIVE PLANS, 2018-2020 CYCLE")		
Long-Term Performance Plan (LTPP)		
Novartis Cash Value Added (cc) (75%)	USD 8.3 billion	Above
Key innovation milestones (25%)		Above
TOTAL LTPP[1]:		**143% of target (payout range 0% – 200%)**
Long-Term Relative Performance Plan (LTRPP)		
Relative TSR against a global healthcare peer group (USD)		Above median
TOTAL LTRPP[1]:		**100% of target (payout range 0% – 200%)**

[1] Combined LTI payout is 126% of target.

2020 total realized compensation for the CEO

The 2020 total realized compensation for the CEO was CHF 12 724 166. It includes payouts of the Annual Incentive, LTPP and LTRPP based on actual performance assessed for cycles concluding in 2020. More information on the overall assessment of the CEO by the Board of Directors can be found in "—2020 CEO balanced scorecard."

	Fixed pay and benefits		Variable pay – performance-related			
CHF	Annual base salary	Pension and other benefits	2020 Annual Incentive	LTPP 2018-2020 cycle[1]	LTRPP 2018-2020 cycle[1]	Total realized compensation
Vasant Narasimhan (CEO)	1 743 750	288 943	2 636 550	5 605 100	2 449 823	**12 724 166**

[1] The shown amounts represent the underlying share value of the total number of shares vested (including Alcon Keep Whole awards of CHF 784 497 as well as dividend equivalents of CHF 660 900) to the CEO for the LTPP and LTRPP performance cycle 2018-2020.

2020 Board compensation system

The compensation system applicable to the Board of Directors is shown below and remains unchanged since the prior year. All fees to the Board members are delivered at least 50% in shares and the remainder in cash.

CHF 000s	AGM 2020-2021 annual fee
Chairman of the Board	3 800
Board membership	280
Vice Chairman	50
Chair of the Audit and Compliance Committee	130
Chair of the Compensation Committee	90
Chair of the following committees: • Governance, Nomination and Corporate Responsibilities Committee • Science & Technology Committee • Risk Committee	70
Membership of the Audit and Compliance Committee	70
Membership of the following committees: • Compensation Committee • Governance, Nomination and Corporate Responsibilities Committee • Science & Technology Committee • Risk Committee	40

2020 Board compensation

Total actual compensation earned by Board members in the 2020 financial year is shown in the table below.

CHF 000s	2020 total compensation[1]
Chairman of the Board	3 805
Other 13 members of the Board	4 925
Total	**8 729**

[1] Includes an amount of CHF 26 118 for mandatory employer contributions for all Board members paid by Novartis to governmental social security systems. This amount is out of total employer contributions of CHF 430 023 , and provides a right to the maximum future insured government pension benefit for the Board member.

Executive Committee compensation philosophy and principles

Novartis compensation philosophy

Our compensation philosophy aims to ensure that we attract and retain outstanding Executive Committee members and that they are rewarded according to their success in implementing the Company strategy, and their contribution to Company performance and long-term value creation.

Pay for performance	• Variable compensation is tied directly to the achievement of strategic Company targets
Shareholder alignment	• Our incentives are significantly weighted toward long-term equity-based plans • Measures under the Long-Term Incentive plans are calibrated to promote the creation of shareholder value • Executive Committee members are expected to build and maintain substantial shareholdings
Balanced rewards	• Balanced set of measures to create sustainable value • Mix of targets based on financial metrics, strategic objectives, and performance versus our competitors
Business ethics	• The Novartis Values and Behaviors are an integral part of our compensation system • They underpin the assessment of overall performance for the Annual Incentive
Competitive compensation	• Total compensation must be sufficient to attract and retain key global talent • Overarching emphasis on pay for performance

Alignment with Company strategy

Our strategy is to build a leading, focused medicines company powered by advanced therapy platforms and data science. We foster a company culture that is inspired, curious and unbossed. We believe these elements drive continued innovation and will support the creation of value over the long term for our Company, society and shareholders.

To align the compensation system with this strategy and to ensure that Novartis is a high-performing organization, the Company operates both a short-term Annual Incentive and an LTI plan with a balanced set of measures and targets. The Board of Directors determines specific, measurable and time-bound performance measures for the Annual Incentive and LTI plan. The Compensation Committee has reviewed the existing compensation system and determined that it continues to support our strategy.

Approach to market benchmarking

There remains significant competition for top executive talent with deep expertise, competencies and proven performance within the pharmaceutical and biotechnology industries. As such, external peer compensation data is one of a number of key reference points considered by the Board of Directors and the Compensation Committee when making decisions on executive pay, helping to ensure that the compensation system and compensation levels at Novartis remain competitive. Novartis makes the commitment to shareholders to confirm benchmarking practices, including the peer group, each year.

The Compensation Committee believes in a rigorous approach to peer group construction and maintenance. The Compensation Committee also believes that using a consistent set of peers that is similar in size and scope enables shareholders to evaluate the compensation year on year and make pay-for-performance comparisons. As such, following a review of the benchmarking peer group, the Compensation Committee decided to maintain the same primary peer group of 14 global healthcare companies until the end of 2020 (with the exception of Celgene, which was acquired by Bristol-Myers Squibb), as presented below.

GLOBAL HEALTHCARE PEER GROUP

AbbVie	Amgen	AstraZeneca
Biogen	Bristol-Myers Squibb	Eli Lilly & Co.
GlaxoSmithKline	Gilead Sciences	Johnson & Johnson
Novo Nordisk	Merck & Co.	Pfizer
Roche	Sanofi	

The companies in this peer group reflect our industry and are similar to Novartis in terms of both size and scope of operations. Novartis target compensation is generally positioned around the market median benchmark for comparable roles within this group.

Although Novartis is headquartered in Switzerland, more than a third of its sales come from the US market, and the US remains a significant talent pool for the recruitment of executives by the Company. It is therefore critical that Novartis is able to attract and retain key talent globally, especially from the US.

For consideration of European and local practices, the Compensation Committee also references a cross-industry peer group of Europe-headquartered multinational companies, selected on the basis of comparability in size, scale, global scope of operations, and economic influence to Novartis.

Six of these companies focus mainly on healthcare: AstraZeneca, GlaxoSmithKline, Merck KgaA, Novo Nordisk, Roche and Sanofi. Nine companies are selected from the STOXX® All Europe 100 Index representing multiple sectors: Anheuser-Busch InBev, Bayer, BMW, Daimler, Danone, Heineken, L'Oréal, Nestlé and Unilever.

Due to the varying impact of the global pandemic on different companies, we believe that this year has demonstrated the importance of using a more homogeneous industry peer group, where possible.

Executive Committee appointments compensation policy

ELEMENT OF COMPENSATION	POLICY
Level	The overall package should be market-competitive to enable the recruitment of global executive talent with deep expertise and competencies.
Annual base salary	The Compensation Committee may appoint individuals who are new to a role on an annual base salary that is below the market level, with a view to increase this toward a market level over a period of three to four years as an individual develops in the role. This prudent approach ensures pay levels are merit-based, with increases dependent on strong performance and proven ability in the role over a sustained period.
Incentives	The ongoing compensation package will normally include the key compensation elements and incentive opportunities in line with those offered to current Executive Committee members. In exceptional circumstances, higher Long-Term Incentive opportunities than those offered to current Executive Committee members may be provided at the Compensation Committee's discretion. Performance measures may include business-specific measures tailored to the specific role.
Pension and other benefits	Newly appointed Executive Committee members are eligible for a local market pension and other benefits in line with the wider employee group.
Buyouts	The Compensation Committee seeks to balance the need to offer competitive compensation opportunities to acquire the talent required by the business with the principle of maintaining a strong focus on pay for performance. As such, when an individual forfeits variable compensation as a result of an appointment at Novartis, the Compensation Committee may offer replacement awards in such form as the Compensation Committee considers appropriate, taking into account relevant factors. Relevant factors include the replacement vehicle (i.e., cash, restricted share units, restricted shares or performance share units), whether the award is contingent on meeting performance conditions or not, the expected value of the forfeited award, the timing of forfeiture (i.e., Novartis mirrors the blocking or vesting period of the forfeited award) and the leaver conditions, in case the recruited individual leaves Novartis prior to the end of the blocking or vesting period. The Compensation Committee will seek to pay no more than is required to match the commercial value or fair value of payments and awards forfeited by the individual.
International mobility	If individuals are required to relocate or be assigned away from their home location to take up their position, relocation support may be provided in line with our global mobility policies (i.e., relocation support, tax equalization).

Treatment of variable compensation for Executive Committee leavers

ELEMENT OF COMPENSATION	POLICY
Annual Incentive – cash element	**Retirement, termination by the Company (for reasons other than performance or conduct), change of control, disability, death i.e. "good leavers"** Pro-rata Annual Incentive is paid to reflect the portion of the year the individual was employed. **Any other reason** No Annual Incentive.
Annual Incentive – mandatory deferral into restricted shares/ RSUs	If a participant leaves employment due to voluntary resignation or misconduct, unvested restricted shares and restricted share units (RSUs) are forfeited. If a participant leaves involuntarily, restricted shares and RSUs are released on the original blocking end date. All awards are subject to non-compete terms until the end of the three-year blocking date, starting from the date of grant.
Annual Incentive – voluntary restricted shares/RSUs/ADRs (US associates only)	Awards are not subject to forfeiture during the deferral period.
Long-Term Incentives (LTPP/LTRPP)	**Voluntary resignation or termination by the Company for misconduct** All of the award will be forfeited. **Termination by the Company for reasons other than performance or conduct, and change in control due to divestment (including retirement)** Awards vest on the regular vesting date, subject to performance, on a pro-rata basis for time spent with the Company during the performance cycle. There is no accelerated vesting. **Death or long-term disability** Accelerated vesting at target will be applied. **Non-compete agreement** All awards are subject to non-compete terms against the healthcare peer group until the vesting date.

Malus and clawback

Any incentive compensation paid to Executive Committee members is subject to malus and clawback rules. This means that the Board of Directors for the CEO, and the Compensation Committee for the other Executive Committee members, may decide – subject to applicable law – to retain any unpaid or unvested incentive compensation (malus), or to recover incentive compensation that has been paid or has vested in the past (clawback). This applies in cases where the payout has resulted from a violation of laws or conflicts with internal management standards, including Company and accounting policies.

This principle applies to both the short-term Annual Incentive and LTI plans.

Executive Committee performance management process

To foster a high-performance culture, the Company applies a uniform performance management process worldwide, based on quantitative and qualitative criteria, including our Values and Behaviors. All Novartis associates, including the CEO and other Executive Committee members, are subject to a formal three-step process: objective setting, performance evaluation and compensation determination. This process is explained below.

Performance targets are generally set before the start of the relevant performance cycle. There is a rigorous framework in place for establishing targets to ensure they are suitably robust and challenging, and align with the strategic priorities of the Group. The key factors taken into account when setting targets include:

- Novartis strategic priorities
- Internal and external market expectations
- Regulatory factors (e.g., new launches, patent expiries)
- Investment in capital expenditure
- Values and Behaviors

The targets are challenged at multiple stages before they are ultimately approved by the Board of Directors. In line with good governance practices, the Compensation Committee works to set targets that are ambitious and challenging but do not encourage undue risk-taking.

Following the end of the performance cycle, the Board of Directors and the Compensation Committee consider performance against the targets originally set. The CEO and Executive Committee members are not present while the Board of Directors and the Compensation Committee discuss their individual performance evaluations. Prior to determining the final outcome, related factors such as performance relative to peers, wider market conditions, general industry trends and good practice are used to inform the overall performance assessment.

Objective setting

- The CEO proposes his targets to the Chairman of the Board; they are then reviewed and approved by the Board of Directors, based on input from the Compensation Committee.
- For other Executive Committee members, targets for their division or unit are initially discussed with the CEO and subsequently approved by the Board of Directors and Compensation Committee.

Performance evaluation

- The CEO's performance against the individual balanced scorecard is assessed by the Board of Directors.
- For Executive Committee members, the CEO discusses with the Chairman each member's performance (assessed against his or her individual balanced scorecard) before making recommendations to the Board of Directors.
- Periodic assessments, including at the mid-year stage, ensure progress is suitably tracked.

Compensation determination

- A recommendation for the CEO's variable pay is made by the Compensation Committee to the Board of Directors for final determination.
- For the Long-Term Incentive financial measures payout schedules, a formulaic approach applies and the Compensation Committee can also exercise judgment to ensure there is appropriate alignment between payout levels and overall performance achieved. The same principle of discretion applies to the relative TSR and innovation performance measures.
- The CEO's recommendations for other Executive Committee members are considered and approved by the Compensation Committee, after which the Board of Directors is notified of the outcomes.

2020 Executive Committee compensation

Performance outcomes

Annual base salary

Overview	• The annual base salary is reviewed each year, taking into account the individual's role, performance and experience, business performance and the external environment, increases across the Group and market movements.
2020 annual base salaries	The 2020 annual base salaries were as follows: • **CEO** (effective March 1, 2020): CHF 1 757 700 • **OTHER EXECUTIVE COMMITTEE MEMBERS** (effective March 1, 2020): All other members of the Executive Committee were awarded increases in line with the average of all Novartis employees, with the exception of four individuals as disclosed in Item 6.B of the 2019 Annual Report. These members were appointed to their roles with base salaries below external market median level and have demonstrated excellent performance during their tenure.

Pension and other benefits

Overview	• Pension and other benefits do not constitute a significant proportion of total compensation and are provided to the Executive Committee on the same terms as all other associates based on local country practices and regulations. • The CEO and all other Swiss-based members of the Executive Committee are members of the Novartis Swiss pension funds, which provide Company contributions on the base salary and Annual Incentive up to the legal cap on the insured salary of CHF 853 200. No supplementary pension plans or savings plans are provided. The CEO's employer pension contributions represent 10.04% of his base salary. • Globally the Company operates both defined benefit and defined contribution pension plans (see also Note 25 to the Group's consolidated financial statements). • Novartis may provide other benefits according to local market practice. These include Company car provision, tax and financial planning, and insurance benefits. • Executive Committee members who are required to relocate internationally may also receive additional benefits (including tax equalization), in line with the Company's global mobility policies.

2020 Annual Incentive

PLAN OVERVIEW

Target Annual Incentive	Annual base salary x Target incentive (% of base salary) = Target Annual Incentive
On-target opportunities	• CEO: 150% of annual base salary • Other Executive Committee members: 80% to 120% of annual base salary

Performance measures	• An Annual Incentive balanced scorecard containing:
	  • Financial performance measures related to Group, division or business unit, where relevant (60% weighting)
	  • Five key strategic objectives in the areas of innovation, operational excellence, data and digital, people and culture, and building trust with society (40% weighting)
	• The 2020 balanced scorecard targets and achievements of the CEO are detailed on the next page.
	• The 2020 balanced scorecards for other Executive Committee members include Group financial targets as well as financial or other quantitative targets that relate to their division or business unit, if applicable.
	• Values and Behaviors are a key component of the Annual Incentive and are embedded in our culture. As such, members of the Executive Committee are expected to demonstrate these to the highest standards.

Target setting	• Financial targets are set at the beginning of each financial year and align with the strategic plan proposed by management to the Board of Directors for approval. • The strategic objectives are aligned with the most important priorities in any performance year.
Payout ranges	• The payout schedule for the Annual Incentive incorporates performance against financial and strategic objectives. The payout range is 0% to 200% of on-target opportunity based on performance, as shown below:

PERFORMANCE	PAYOUT (% of on-target)
Outstanding	170% – 200%
Exceeds expectations	130% – 160%
Meets expectations	80% – 120%
Partially meets expectations	40% – 70%
Below expectations	0%

Payout formula	Annual base salary x Target incentive (% of base salary) x Payout factor (% of target: 0%–200%) = Realized Annual Incentive
Payout vehicle	• At the end of the performance period, 50% is paid in cash, and the remaining 50% is delivered in Novartis restricted shares or RSUs, deferred for three years (see "—Treatment of variable compensation for Executive Committee leavers"). • Executives may choose to receive all or part of the cash portion of their Annual Incentive in Novartis shares or American Depositary Receipts (ADRs; US only) that will not be subject to forfeiture conditions. In the US, awards may also be delivered in cash under the US-deferred compensation plan. • Clawback and malus provisions apply to all Annual Incentive awards.
Dividend rights, voting rights and settlement	• Novartis restricted shares carry voting rights and dividends during the vesting period. RSUs are of equivalent value but do not carry voting rights and dividends during the vesting period. • Following the vesting period, settlement of RSUs is made in unrestricted Novartis shares or ADRs.

2020 CEO BALANCED SCORECARD

This section presents the balanced scorecard for the CEO. Balanced scorecard performance is measured in constant currencies to reflect operational performance that can be influenced. The Board of Directors uses a stringent process to set ambitious financial targets to incentivize superior performance. No adjustments were made to the targets as a result of the COVID-19 pandemic. In addition to the financial targets, the CEO also has ambitious strategic objectives across five key pillars, two of which are related to ESG matters.

During the year, the Compensation Committee took the opportunity to benchmark its approach to incentive target setting. The committee asked its independent advisor to survey several organizations, representing global multinationals from various industries, to gain insight into their variable incentive target-setting processes. Through this review, it was concluded that Novartis practices are in line with the surveyed companies, and no changes to the target-setting process were made.

CEO achievements – 2020	Target[1]	Achievement versus target
Financial measures – 60% of total Annual Incentive, comprising:		
Group net sales (cc) (30%)	50 781 million	Below
Group operating income (cc) (30%)	9 745 million	Significantly above
Group free cash flow as a % of sales (cc) (20%)	24.3%	Above
Share of peers for Novartis Group (USD) (20%)	8.3%	Met
Overall assessment of Group financial targets in constant currencies		**Met**

[1] For performance evaluation purposes, target as well as actual financial KPIs included the results of the Sandoz US dermatology business and generic oral solids portfolio, which were expected to be divested to Aurobindo Pharma USA Inc. This deal was later terminated by mutual agreement with Aurobindo.

Strategic objectives – 40% of total Annual Incentive, comprising:	
Innovation (20%) Novartis continued to strengthen its product portfolio with 26 major approvals and 13 major submissions. Thirty-one new targets or technologies were discovered; 35 projects achieved first patient, first visit; and 13 positive proofs of concept/proofs of mechanism were achieved. However, due to pandemic and data-related delays, milestones for Lu-PSMA-617 and *Entresto* (for heart failure with preserved ejection fraction) were missed. Despite the pandemic, launches of *Kesimpta*, *Cosentyx* (for non-radiographic axial spondyloarthritis), *Enerzair* and *Tabrecta* showed strong early performance, with *Tabrecta* being the first-ever fully virtual launch. The launch of AVXS-101 intrathecal was delayed due to a partial hold on clinical trials based on findings in a small preclinical animal study. We continued to strengthen our advanced therapy platforms across the value chain, moving forward a breadth of clinical and preclinical programs, expanding our manufacturing capacity, and making our marketed therapies like *Zolgensma*, *Kymriah* and *Lutathera* widely available around the world.	**Met**
Operational excellence (20%) Solid sales growth (3% increase compared to 2019), transformation of our NTO network, and improved productivity in marketing and sales as well as research and development drove double-digit cc growth in core operating income to USD 15.4 billion. Compared to the prior year, core operating income margin increased by 2.8 percentage points (cc) to 31.7%. Net income from continuing operations grew 13% (20% cc), mainly driven by higher operating income. Full-year free cash flow was USD 11.7 billion, as higher operating income was more than offset by increased legal payments and lower divestments.	**Met**
Data and digital (20%) We continued to advance and accelerate our digital lighthouse platforms in areas of biggest impact. The data42 analytics platform is now scaled. We have more than 5 000 users on our Nerve Live platform to manage clinical trials in real time. Through our remote clinical trial program, we ran over 35 000 remote monitoring interventions to mitigate the impact of the pandemic. In the commercial and medical space, we transitioned all sales representatives globally to a harmonized customer relationship management tool. We also continued to significantly invest in next-generation marketing and sales, with 1 400 marketers trained. SpotOn, our control center for manufacturing and supply chain flow, is now live at five sites with three technology platforms, and is supporting our NTO organization to connect and contextualize data to predict and simulate scenarios.	**Met**

2020 CEO BALANCED SCORECARD – CONTINUED

People and culture (20%) — **Met**

We continued to build a culture that is inspired, curious and unbossed. The score for engagement in our quarterly employee survey reached an all-time high of 80 (out of 100) in the fourth quarter of 2020, compared to 74 a year earlier, bringing us further above the pharmaceutical industry benchmark of 73 and the global benchmark of 74.

We made good progress toward our associate learning initiatives in 2020, with 45.7 learning hours per associate on average. Additionally, the Unbossed Leadership Experience leadership program reached over 5 000 leaders.

We continued to make steady progress toward our Equal Pay International Coalition (EPIC) pledge to achieve gender balance in management by 2023. The percentage of women in management overall rose to 45% in 2020 (from 44% a year earlier) and to 33% for Novartis Top Leaders (up 2%, slightly below the 2020 aspiration). Novartis has a global median pay gap of -3.1% and a global mean pay gap of +3.6% (available data at the time of disclosure). While we acknowledge this percentage is influenced by worldwide workforce demographics, this is significantly ahead of the Bloomberg benchmarks of +19% median and +23% mean. We introduced an inclusion index and achieved a 74 score versus a global benchmark of 71 and a pharmaceutical industry benchmark of 70.

Building trust with society (including access to healthcare, reputation and other ESG topics) (20%) — **Significantly above**

The Company's ESG strategy comprises four key pillars. Some particular highlights for 2020 include the settling of historic litigations matters, issuing a sustainability-linked bond, committing to achieve full carbon neutrality by 2030, and integrating ESG across all functions. These efforts contributed to improvements in our scores on a number of ESG indices from external agencies. Namely, we were sector leaders for Sustainalytics and FTSE-4Good, and received an "A" rating from MSCI in the most recent reporting cycle. Additional information on these achievements is provided below and in the Novartis in Society ESG Report 2020.

ETHICAL STANDARDS

In June 2020, Novartis reached settlements for the investigations into historical conduct by the Company and its subsidiaries dating back to 2012. With these agreements, all legacy compliance-related allegations against Novartis are closed. Our new Code of Ethics was rolled out in September, providing our associates with a robust framework for decision-making to help navigate situations that are complex or unclear. Third-party risk assessments were conducted for 100% of new eligible suppliers and distributors.

PRICING AND ACCESS

Compared to 2019, we increased our reach with strategic innovative therapies to patients in low- and middle-income countries (LMICs) by 27%, a significant step toward reaching our 2025 goal (200% increase in patient reach). In 2020, we launched 22 emerging market brands, and 100% of new launches have an access strategy in place. *Piqray* in India, for instance, was one month ahead of the first European country launch thanks to early planning and more formalized processes. In response to the COVID-19 pandemic, Novartis partnered with the Africa Medical Supplies Platform (AMSP) to facilitate the supply of 15 Sandoz medicines to 55 African and 15 CARICOM-eligible countries. In 2020, Novartis issued a sustainability bond linked to our access targets for strategic innovative therapies and our flagship programs, becoming the first healthcare company to issue a corporate bond of this kind.

GLOBAL HEALTH

The four Novartis global health flagship programs in leprosy, malaria, Chagas disease and sickle cell disease focus on diseases where there is a market failure and where we have the ability to innovate. Progress in this area was delayed, as the pandemic limited accessibility to clinics. However, we were able to treat approximately 5 000 patients with sickle cell disease in sub-Saharan Africa and expand the rollout of the Africa sickle cell disease program to Kenya, Tanzania and Uganda.

RESPONSIBLE CITIZENSHIP

Novartis advanced its ambition to reduce its environmental impact, aiming to achieve full carbon, plastic and water neutrality by 2030. In 2020, we reduced our carbon emissions, waste disposal and water consumption compared to 2019 by an estimated 16%, 21% and 25%, respectively – well ahead of our 8% target in each of the three areas. We made measurable progress toward our public equity pledges, preparing to go live with pay transparency in 10 new countries from February 2021, and eliminating the use of historical salary data in 75% of cases when making internal and external hiring decisions. To address racial inequalities, our Novartis US Foundation has shifted focus and is dedicated to tackling this issue.

Overall assessment of strategic objectives	**Met**

Overall assessment of CEO balanced scorecard	**Met**

ANNUAL INCENTIVE PAYOUT

Payout	Based on the overall assessment, the Board of Directors decided on an Annual Incentive resulting in a payout for the CEO amounting to **CHF 2 636 550**, which is 100% of target, within the range of 0–200%.

Long-Term Incentive plans, 2018-2020 cycle

- The Long-Term Performance Plan (LTPP) is the first of two LTI plans operated over the 2018-2020 cycle and rewards creation of long-term value and innovation.
- The Long-Term Relative Performance Plan (LTRPP) is the second of two LTI plans operated over the 2018-2020 cycle and rewards competitive shareholder return relative to the global healthcare peer group.

The structure of the two plans is summarized below.

OVERVIEW OF LONG-TERM INCENTIVE PLANS

Grant formula	At the start of the performance cycle, performance share units (PSUs) are granted under each of the Long-Term Incentive plans, as follows: **Step 1**: Annual base salary x Target incentive % = Grant value **Step 2**: Grant value / Share price = Target number of PSUs
On-target opportunity	**LTPP:** • CEO: 200% of annual base salary • Other Executive Committee members: between 130% and 190% of annual base salary **LTRPP:** • CEO: 125% of annual base salary • Other Executive Committee members: between 30% and 80% of annual base salary
Payout range	• From 0% to 200% of the on-target amount based on performance
Award vehicle	PSUs granted at the beginning of the cycle vest at the end of the three-year performance cycle and are converted into Novartis shares. PSUs carry dividend equivalents that are paid in shares at the end of the cycle to the extent that performance conditions have been met. **Payout formula:** Target number of PSUs x Performance factor + Dividend equivalents = Realized PSUs Policy information in "—Treatment of variable compensation for Executive Committee leavers" provides details on the treatment of Long-Term Incentive awards for leavers.

LTPP performance outcomes

NOVARTIS CASH VALUE ADDED (NCVA) (75% OF LTPP)

Description	NCVA incentivizes sales growth and margin improvement as well as asset efficiency. It is calculated as follows: Operating income + Amortization, impairments, and adjusting for gains/losses from non-operating assets – Taxes – Capital charge (based on WACC[1]) on gross operational assets = NCVA[2] [1] WACC = weighted average cost of capital [2] NCVA = (cash flow return on investment % – WACC) x gross operational assets in constant currencies The NCVA performance factor is based on a 1:3 payout curve, whereby a 1% deviation in realization versus target leads to a 3% change in payout (for example, a realization of 105% leads to a payout factor of 115%). Accordingly, if performance over the three-year vesting period falls below 67% of target, no payout is made for this portion of the LTPP. Conversely, if performance over the three-year vesting period is above 133% of target, payout for this portion of the LTPP is capped at 200% of target.
Group performance outcome for the 2018-2020 cycle	For the last three cycles, the Board of Directors has set increasingly ambitious NCVA targets to promote improvements to operational efficiencies. During the 2018-2020 cycle, Novartis delivered an NCVA of USD 9.6 billion, 16% ahead of a target of USD 8.3 billion in constant currencies. When setting the target for the 2018-2020 cycle, which increased by USD 2.2 billion (i.e., 37% versus the 2017-2019 cycle), the Compensation Committee took into account the following: • An expected increase in operational performance • Key business transformation investments and restructuring costs, particularly in the manufacturing and business services organizations The 2018-2020 NCVA performance was mainly driven by the following: • Out-performance of sales targets over the three-year cycle (predominantly in 2019) by Innovative Medicines (+USD 1.3 billion, mainly driven by *Entresto*, *Promacta/Revolade*, and *Tafinlar + Mekinist*) • Significant increase in productivity, mainly in manufacturing (with core production cost of goods sold as a percentage of sales improving by 2% points in constant currencies), marketing and sales, and research and development. This allowed for targeted launch investments and increased core operating income margin in constant currencies No adjustments were made to the target to reflect the impact of the COVID-19 pandemic. Following the application of the agreed payout curve, the 116% achievement versus target generates a performance factor of 147% of target for this part of the LTPP. This will be the last year NCVA is considered in our LTI plans. For LTPP cycles starting from 2019, NCVA has been replaced with a combination of a three-year net sales compound annual growth rate (CAGR) and core operating income CAGR.

INNOVATION (25% OF LTPP)

Description	Innovation is a key value driver for shareholders and is critical to our future. At the beginning of the cycle, the Science & Technology Committee (formerly the Research & Development Committee) determines the most important target milestones, considering the following: • The expected future potential revenue • The potential qualitative impact of research and development on science and medicine • The potential impact of research and development on the treatment or care of patients For the cycle 2018-2020, innovation performance is based on group-wide innovation using a combination of Novartis Institutes for BioMedical Research (NIBR) and Global Drug Development (GDD) targets. At the end of the cycle, the Compensation Committee determines the payout factor based on the performance assessment made by the Science & Technology Committee. In the healthcare industry, achievement of 60% to 80% of pipeline targets set at the beginning of a three-year cycle is considered good performance. The payout range 0% to 150% of target is based on the achievement of the target milestones, and payout above 150% of target is only delivered for truly exceptional performance.
Group performance outcome for the 2018-2020 cycle	In the 2018-2020 period, Novartis exceeded its innovation performance targets. We achieved a number of readouts and submissions in the Innovative Medicines Division, including approvals for *Mayzent* in the US and the EU to treat multiple sclerosis (MS); *Kesimpta* in the US to treat MS; *Beovu* in the US and the EU to treat neovascular (wet) age-related macular degeneration; *Piqray* in the US and the EU to treat HR+/HER2- advanced breast cancer with a PIK3CA mutation; *Atectura* and *Enerzair* in the EU to treat asthma; and *Adakveo* in the US and the EU to treat sickle cell disease. *Entresto* for heart failure with preserved ejection fraction (US) and *Cosentyx* for non-radiographic axial spondyloarthritis (US and EU) were also approved. Although the readout for QAW039 (fevipiprant) in asthma was attained, the program failed to meet its goals in Phase III clinical trials and was therefore terminated. Overall, Novartis achieved nine approvals for new molecular entities over the cycle. Sandoz achieved US approval for long-acting oncology supportive care biosimilar *Ziextenzo* (pegfilgrastim-bmez), becoming the first and only company to offer US patients long- and short-acting filgrastim biosimilar treatment options. NIBR achieved its targets, discovering eight new first-in-class potential targets for liver diseases and initiating first-in-human studies of a CD19-targeted CAR-T therapy with an advanced manufacturing process. Following input from the Science & Technology Committee, the Board of Directors approved an innovation performance factor for the CEO and Executive Committee members of 131% of target.

LTPP PAYOUT

Payout	Overall, the Board of Directors approved an LTPP payout for the CEO amounting to **CHF 5 605 100**, which is 143% of target, within the range of 0–200%. This includes dividend equivalents of CHF 459 895.

LTRPP performance outcomes

RELATIVE TOTAL SHAREHOLDER RETURN (TSR) (100% OF LTRPP)

Description

Performance is based on our TSR relative to a global healthcare peer group. Outperformance of this peer group is a key indicator that Novartis is delivering long-term value to its shareholders.

The peer group and payout matrix for the 2018-2020 performance cycle are as follows:

2018-2020 peer group (14 companies, excluding Novartis)		
AbbVie	Amgen	AstraZeneca
Biogen	Bristol-Myers Squibb	Eli Lilly & Co.
GlaxoSmithKline	Gilead Sciences	Johnson & Johnson
Novo Nordisk	Merck & Co.	Pfizer
Roche	Sanofi	

Novartis position in the peer group	Payout range (% of target)
Position 1 – 2	170% – 200%
Position 3 – 5	130% – 160%
Position 6 – 8	80% – 120%
Position 9 – 15	0%

The payout matrix includes a significant reduction (including scope to reduce to nil) when Novartis does not outperform the majority of the companies in the group. At the end of the performance cycle, all companies are ranked in order of highest to lowest TSR in USD. As communicated in the 2019 Annual Report, for the 2018-2020 cycle, a one-day pricing approach was taken to determine the share value at the start of the performance cycle, and a three-month averaging method was then used at the end of the cycle.

The Compensation Committee uses its discretion to determine the payout factor within the ranges shown above, and takes into consideration factors such as absolute TSR, overall economic conditions, currency fluctuations and other unforeseeable economic situations.

Group performance outcome for the 2018-2020 cycle

Novartis TSR over the three-year period (2018-2020) was 29.4% using the methodology described above. When compared to the global healthcare peer group, Novartis TSR ranked No. 7 out of 15 companies.

LTRPP PAYOUT FOR THE 2018-2020 CYCLE

Payout

Based on the ranking, the Board of Directors approved an LTRPP payout of 100% of target for the CEO, resulting in **CHF 2 449 823**, which includes dividend equivalents of CHF 201 005.

Combined LTI (LTPP and LTRPP) outcomes for the 2018-2020 cycle

Payout

When considering both the LTPP and LTRPP, the total combined LTI payout was 126% of target for the CEO, resulting in **CHF 8 054 923**, compared to 157% last year. This amount includes CHF 660 900 of dividend equivalents accrued over the three-year cycle and CHF 784 497 in Alcon Keep Whole awards. Further detail can be found in the tables “2018-2020 LTPP performance cycle” and “2018-2020 LTRPP performance cycle.”

Realized compensation

To aid shareholders' understanding of the link between pay and performance, the Compensation Committee discloses the realized compensation for the CEO individually, and for the other members of the Executive Committee on an aggregated basis. Disclosing realized compensation means that the Annual Incentive and the LTI are disclosed at the end of their respective performance cycles, reflecting actual payouts based on performance.

The total actual payout may vary year on year depending on multiple factors, including the composition of the Executive Committee and the tenure of its members (as new members may not have a vested LTI), compensation increases, payout of variable compensation based on actual performance, share price fluctuations of the LTI, and dividend equivalents.

As communicated in the 2018 and 2019 Annual Reports, all Novartis shareholders received a dividend in kind in Alcon shares at the spin-off date, which created immediate and significant value to shareholders. However, unvested performance share units (PSUs), such as the LTPP and LTRPP, were not entitled to such dividend in kind. To ensure equal treatment relative to shareholders, PSU holders were instead awarded Alcon Keep Whole awards of similar value to the dividend in kind. These are only realized at the same time as the underlying PSUs, and are subject to the same performance conditions. The vesting of these Alcon Keep Whole awards will be considered in the realized compensation of the CEO and ECN members.

2020 realized compensation for the CEO and other Executive Committee members

The Board reconsidered the executive incentive targets set prior to the pandemic and concluded that no changes should be made.

To determine the appropriateness of the 2020 CEO and executive compensation payouts under the Annual Incentive and LTI plans, the Board of Directors and the Compensation Committee reviewed management's performance and contribution, taking the following into consideration:

- No COVID-19-related government support or employee redundancies
- Supportive treatment of associates and responsible societal approach adopted throughout the pandemic
- Resilient operational and financial performance against targets
- Strong progress toward strengthening our global product portfolio
- Accomplishments across all strategic pillars, with careful attention to ESG targets
- 29.4% shareholder return over cycle 2018-2020, when considering a three-month price averaging at the end of the cycle (40.4% when considering the spot rate on December 31, 2020)

On this basis, the Board of Directors determined that no discretionary judgments were required to the resulting payouts. More detail on the performance of the CEO can be found in "—2020 CEO balanced scorecard."

The Board of Directors awarded the CEO a 2020 Annual Incentive of CHF 2 636 550, which is 100% of target, within the payout range of 0% to 200%.

The 2018-2020 LTI plans comprise the LTPP and the LTRPP. The 2018-2020 LTPP delivered strong results, with Cash Value Added and innovation above target (see "—LTPP performance outcomes"). For the 2018-2020 LTRPP, Novartis ranked above median at position 7 out of a total of 15 global healthcare peers (including Novartis), on three-year relative TSR. Overall, when considering both plans, the Board of Directors awarded the CEO a total LTI payout of CHF 8 054 923, corresponding to a 126% payout against a maximum of 200%.

These incentive performance outcomes, combined with base salary and other benefits, pension, Alcon Keep Whole awards and dividend equivalents, resulted in 2020 total realized compensation for the CEO of **CHF 12 724 166**.

The following table reports fixed and other compensation for the year, including the Annual Incentive for the 2020 performance year, the realized LTI for the 2018-2020 performance cycle, and any buyouts vesting in 2020. The portion of the Annual Incentive paid in shares for the year 2020 is disclosed using the underlying value of Novartis shares at the date of grant, while the realized values of any other equity awards (including dividend equivalents and Alcon Keep Whole awards) are calculated using the share price on the date of vesting.

2020 realized compensation for the CEO and other Executive Committee members

		2020 annual base salary	2020 pension benefits[1]	2020 Annual Incentive		Long-Term Incentives		Other 2020 compensation	
						LTPP 2018-2020 cycle	LTRPP 2018-2020 cycle		
	Currency	Cash (amount)	Amount	Cash	Equity[2]	Equity (value at vesting date)[3]	Equity (value at vesting date)[3]	Amount[2 4 5]	Total realized compensation (incl. share price movement)[6]
Executive Committee members									
Vasant Narasimhan (CEO)	CHF	1 743 750	175 102	1 318 275	1 318 275	5 605 100	2 449 823	113 841	12 724 166
Aggregate realized compensation of the other 12 Executive Committee members[7]	CHF	9 792 833	2 320 106	4 901 015	5 997 169	14 416 662	3 863 980	4 803 881	46 095 647
Total	**CHF**	**11 536 583**	**2 495 208**	**6 219 290**	**7 315 444**	**20 021 762**	**6 313 803**	**4 917 722**	**58 819 813**

See 2019 realized compensation for the CEO and other Executive Committee members for 2019 comparative figures.

[1] Includes mandatory employer contributions of CHF 8 336 for the CEO and CHF 59 591 for the other Executive Committee members paid by Novartis to governmental social security systems. This amount is out of total employer contributions of CHF 6 088 770 paid in 2020 for all Executive Committee members, and provides a right to the maximum future insured government pension benefit for the Executive Committee members.

[2] The portion of the Annual Incentive delivered in equity is rounded up to the nearest share, based on the closing share price on the grant date (January 20, 2021) of CHF 86.01 per Novartis share and USD 96.92 per ADR.

[3] The amounts represent the underlying share value of the 245 786 LTPP PSUs and 75 714 LTRPP PSUs vesting on January 18, 2021, to the CEO and other Executive Committee members for the performance cycle 2018-2020, inclusive of earned Alcon Keep Whole awards and dividend equivalents for the three-year cycle (for details see LTPP performance cycle and LTRPP performance cycle). The taxable value is determined using the closing share price on the day the Novartis Board of Directors approved the final LTPP and LTRPP performance factors (i.e., January 20, 2021) of CHF 86.01 per Novartis share and USD 96.92 per ADR. Bertrand Bodson, Shannon Thyme Klinger, Steffen Lang, Susanne Schaffert and Marie-France Tschudin were promoted to the Executive Committee during the course of the performance period 2018-2020, and as such, the information disclosed reflects their pro-rata LTPP and LTRPP 2018-2020 payouts attributable to the period in which they were a member of the Executive Committee. Klaus Moosmayer, John Tsai and Richard Saynor joined Novartis after the 2018 LTI awards being made and hence did not receive LTPP and LTRPP awards for the 2018-2020 performance period.

[4] Includes any other perquisites, benefits in kind, international assignment benefits as per the global mobility policy (e.g., housing, international health insurance, children's school fees, tax equalization). The 2020 tax payments for Richard Saynor were CHF 1 181 889 and for Susanne Schaffert were CHF 431 180.

[5] Includes 6 128 vested RSUs (CHF 471 666), of which 698 vested on March,13 2020, and 5 430 on July 28, 2020, as well as 4 022 vested PSUs (CHF 281 379) on March 13, 2020, to John Tsai in lieu of the LTI that he forfeited when leaving his previous employer. Also includes 2 421 vested RSUs (USD 229 487) on January 4, 2020, to James Bradner in lieu of the LTI that he forfeited when leaving his previous employer and 6 011 vested PSUs (CHF 550 788) on January 17, 2020, to Klaus Moosmayer in lieu of the LTI he forfeited when leaving his previous employer. Lastly, includes 2 348 vested RSUs (CHF 224 516) and 2 178 vested PSUs (CHF 208 260) on February 15, 2020, to Richard Saynor in lieu of the LTI that he forfeited when leaving his previous employer. The PSUs had the same performance measures as the LTPP for the 2017-2019 performance cycle (NCVA and long-term innovation).

[6] All amounts are before deduction of the social security contribution and income tax due by the Executive Committee member.

[7] Amounts for Executive Committee members paid in USD were converted at a rate of USD 1.00 = CHF 0.939, which is the same average exchange rate used in the Group's 2020 consolidated financial statements (similar rule applies in case of payments made in other currencies during the year).

The table and information below provide additional details on awards granted as part of the 2018-2020 LTPP and LTRPP performance cycle, including the number of shares awarded and delivered, following the application of the payout factor and the addition of dividend equivalent shares.

2018-2020 LTPP performance cycle

	PSUs at grant			Shares delivered at vesting				
	PSUs (target number)	PSUs (target value at grant date) (CHF)[2]	Payout factor for LTPP (% of target)	Performance shares delivered at vesting (number)	Performance shares delivered at vesting (value at vesting date) (CHF)[3]	Dividend equivalent shares delivered at vesting (number)[4]	Dividend equivalent shares delivered at vesting (value at vesting date) (CHF)	Total shares delivered at vesting (value at vesting date) (CHF)
Executive Committee members[1]								
Vasant Narasimhan	41 833	3 467 956	143%	59 821	5 145 204	5 347	459 895	5 605 100
Other 12 Executive Committee members	106 674	8 800 729	143%	152 457	13 285 757	12 984	1 147 618	14 416 662
Total	**148 507**	**12 268 684**		**212 278**	**18 430 962**	**18 331**	**1 607 514**	**20 021 762**

[1] Bertrand Bodson, Shannon Thyme Klinger, Steffen Lang, Susanne Schaffert and Marie-France Tschudin joined the Executive Committee during the course of the performance period 2018-2020. As such, the information disclosed reflects their pro-rata LTPP 2018-2020 payout attributable to the period they were a member of the Executive Committee. Klaus Moosmayer, John Tsai and Richard Saynor joined Novartis post the 2018 LTPP awards being made and hence did not receive an LTPP award for the 2018-2020 performance period.

[2] The shown amounts represent the underlying share value of the target number of PSUs granted to each Executive Committee member for the performance period 2018-2020, based on the closing share price on the grant date (January 18, 2018) of CHF 82.9 per Novartis share and USD 86.41 per ADR (pre-Alcon spin-off share price).

[3] The shown amounts, inclusive of earned Alcon Keep Whole awards and dividend equivalents, represent the underlying share value of the target number of PSUs vested for the performance period 2018-2020, based on the last closing share price on the day the Novartis Board of Directors approved the final LTPP and LTRPP performance payout factors (i.e., January 20, 2021) of CHF 86.01 per Novartis share and USD 96.92 per ADR.

[4] Dividend equivalent shares are calculated on the dividend each member of the Executive Committee would have received, based on the actual number of shares delivered at the end of the performance period 2018-2020. At vesting, the dividend equivalents are credited in shares or ADRs.

2018-2020 LTRPP performance cycle

	PSUs at grant			Shares delivered at vesting				
	PSUs (target number)	PSUs (target value at grant date) (CHF) [2]	Payout factor for LTRPP (% of target)	Performance shares delivered at vesting (number)	Performance shares delivered at vesting (value at vesting date) (CHF) [3]	Dividend equivalent shares de ivered at vesting (number) [4]	Dividend equivalent shares delivered at vesting (value at vesting date) (CHF)	Total shares delivered at vesting (value at vesting date) (CHF)
Executive Committee members [1]								
Vasant Narasimhan	26 146	2 167 503	100%	26 146	2 248 817	2 337	201 005	2 449 823
Other 12 Executive Committee members	40 722	3 355 831	100%	40 722	3 559 493	3 486	309 988	3 863 980
Total	**66 868**	**5 523 335**		**66 868**	**5 808 310**	**5 823**	**510 993**	**6 313 803**

[1] Shannon Thyme Klinger, Steffen Lang, Susanne Schaffert and Marie-France Tschudin joined the Executive Committee during the course of the performance period 2018-2020. As such, the information disclosed reflects their pro-rata LTRPP 2018-2020 payout attributable to the period they were a member of the Executive Committee. Klaus Moosmayer, John Tsai and Richard Saynor joined Novartis post the 2018 LTRPP awards being made and hence did not receive an LTRPP award for the 2018-2020 performance period.

[2] The shown amounts represent the underlying share value of the target number of PSUs granted to each Executive Committee member for the performance period 2018-2020, based on the closing share price on the grant date (January 18, 2018) of CHF 82.9 per Novartis share and USD 86.41 per ADR (pre-Alcon spin-off share price).

[3] The shown amounts, inclusive of earned Alcon Keep Whole awards and dividend equivalents, represent the underlying share value of the target number of PSUs vested for the performance period 2018-2020, based on the last closing share price on the day the Novartis Board of Directors approved the final LTPP and LTRPP performance payout factors (i.e., January 20, 2021) of CHF 86.01 per Novartis share and USD 96.92 per ADR.

[4] Dividend equivalent shares are calculated on the dividend each member of the Executive Committee would have received, based on the actual number of shares delivered at the end of the performance period 2018-2020. At vesting, the dividend equivalents are credited in shares or ADRs.

The table and information below provide details on the 2019 realized compensation for the CEO and other Executive Committee members, for comparative purposes.

2019 realized compensation for the CEO and other Executive Committee members

		2019 annual base salary	2019 pension benefits[1]	2019 Annual Incentive		Long-Term Incentives		Other 2019 compensation	
						LTPP 2017-2019 cycle	LTRPP 2017-2019 cycle		
	Currency	Cash (amount)	Amount	Cash	Equity[2]	Equity (value at vesting date)[3]	Equity (value at vesting date)[3]	Amount[2 4 5]	Total realized compensation (incl. share price movement)[6]
Executive Committee members									
Vasant Narasimhan (CEO)	CHF	1 653 333	165 547	2 008 800	2 008 839	3 510 963	1 107 806	160 452	10 615 740
Aggregate realized compensation of the other 14 Executive Committee members, including the two members who stepped down during financial year 2019[7 8]	CHF	9 370 547	2 131 905	5 809 455	7 013 842	17 932 704	6 383 700	7 233 594	55 875 748
Total	**CHF**	**11 023 880**	**2 297 452**	**7 818 255**	**9 022 682**	**21 443 667**	**7 491 506**	**7 394 046**	**66 491 488**

[1] Includes mandatory employer contributions of CHF 4 373 for the CEO and CHF 63 461 for the other Executive Committee members paid by Novartis to governmental social security systems. This amount is out of total employer contributions of CHF 3 923 070 paid in 2019 for all Executive Committee members, and provides a right to the maximum future insured government pension benefit for the Executive Committee members.
[2] The portion of the Annual Incentive delivered in equity is rounded up to the nearest share, based on the closing share price on the grant date (January 21, 2020) of CHF 92.89 per Novartis share and USD 95.19 per ADR.
[3] The amounts represent the underlying share value of the 232 425 LTPP PSUs and 77 904 LTRPP PSUs vesting on January 17, 2020, to the CEO and other Executive Committee members for the performance cycle 2017-2019, inclusive of earned dividend equivalents for the three-year cycle (details in "LTPP performance cycle and LTRPP performance cycle"). The taxable value is determined using the closing share price on the day the Novartis Board of Directors approved the final LTPP and LTRPP performance factors (i.e., January 21, 2020) of CHF 92.89 per Novartis share and USD 95.19 per ADR. Shannon Thyme Klinger, Steffen Lang, Susanne Schaffert and Marie-France Tschudin were promoted to the Executive Committee during the course of the performance period 2017-2019, and as such, the information disclosed reflects their pro-rata LTPP and LTRPP 2017-2019 payouts attributable to the period they were a member of the Executive Committee. Bertrand Bodson, Klaus Moosmayer, John Tsai, Robert Weltevreden and Richard Saynor joined Novartis post the 2017 LTI awards were made and hence did not receive LTPP and LTRPP awards for the 2017-2019 performance period.
[4] Includes any other perquisites, benefits in kind, international assignment benefits as per the global mobility policy (e.g., housing, international health insurance, children's school fees, tax equalization) as well as vested shares under LTPP and LTRPP after the "step down" date.
[5] Includes 5 430 vested RSUs (CHF 502 003) on July 28, 2019, to John Tsai, in lieu of the LTI that he forfeited when leaving his previous employer and 1 323 vested RSUs (CHF 123 092) and 14 470 vested PSUs (CHF 1 346 289) on March 24, 2019, to Paul Hudson in lieu of the LTI that he forfeited when leaving his previous employer. The PSUs had the same performance measures as the LTPP for the 2016-2018 performance cycle (NCVA and long-term innovation).
[6] All amounts are before deduction of the social security contribution and income tax due by the Executive Committee member.
[7] Comprises the compensation of Richard Francis, the former CEO of Sandoz including the vesting of his Long-Term Incentives for performance cycle 2017-2019, as per the plan rules. Unvested shares for Paul Hudson were forfeited upon his departure from the Company.
[8] Amounts for Executive Committee members paid in USD were converted at a rate of USD 1.00 = CHF 0.9938, which is the same average exchange rate used in the Group's 2019 consolidated financial statements.

Realized compensation for the CEO and other Executive Committee members for 2020 compared to 2019

When comparing the 2020 CEO realized pay to 2019, there is an overall increase of 19.9%. The change is driven by a significant increase in realized LTI due to the following:

- The vesting of the CEO's first LTI granted following his appointment to CEO. For the 2018-2020 cycle, Vasant Narasimhan received an increase in target LTI to reflect his promotion from Global Head of Drug Development to CEO.
- The vesting of the CEO's Alcon Keep Whole awards. The total vesting value of these Alcon Keep Whole awards was CHF 784 497, which is included in the corresponding LTPP and LTRPP values in the prior tables.

The increase was partly offset by the lower variable incentive performance payout for the 2020 Annual Incentive (100% versus 160% in 2019) and the LTI cycle 2018-2020 (126% for the LTPP and LTRPP combined versus 157% for cycle 2017-2019).

The 2020 total realized compensation for the Executive Committee members (comprising the CEO and the other 12 active Executive Committee members) was CHF 58 819 813. This is a decrease compared to the prior year and can be attributed to (i) lower Annual Incentive payouts on average and lower 2018-2020 LTI payouts as well as (ii) a reduction in members reported (two members stepped down and were replaced in 2019, whereas no members stepped down in 2020).

Forecasts for 2021 realized compensation for the other Executive Committee members

A number of current members joined the Executive Committee, both from internal and external positions, during 2018. The LTPP 2019-2021 will therefore be their first annual LTI to be realized/fully reported since their appointment. It may therefore be reasonable to expect an increase in realized compensation for these members next year, depending on the performance of the plan against target and the evolution of the share price.

Compensation at grant value

In accordance with the Swiss Ordinance against Excessive Compensation in Listed Companies, Novartis continues to disclose total compensation at grant value for the CEO and other Executive Committee members. The following tables disclose for the CEO and other Executive Committee members:

- Fixed 2020 compensation (base salary and benefits)
- The actual cash portion and the deferred portion granted in equity of the 2020 Annual Incentive
- 2020-2022 LTPP performance cycle awards, which are reported at target value at grant date under the assumption that the awards will vest at 100% achievement, excluding any share price movement and dividend equivalents that may be accrued over the performance cycle. The future payout will be determined only after the performance cycle concludes in three years (i.e., the end of 2022), with a payout range of 0% to 200% of the target value.
- Other compensation for 2020, which includes other benefits, either paid in cash or granted in equity in the year

To assess CEO actual pay for performance in 2020, including the Annual Incentive payout for the 2020 performance year and the LTI payouts for the 2018-2020 performance cycle, shareholders should refer to the 2020 realized compensation table in "—2020 realized compensation for the CEO and other Executive Committee members."

2020 compensation at grant value for the CEO and other Executive Committee members

		Fixed compensation and pension benefits		Variable compensation				
		Actual compensation paid or granted for 2020				Long-Term Incentive 2020-2022 cycle grants at target		
		2020 annual base salary	2020 pension benefits	2020 Annual Incentive (performance achieved)		LTPP 2020-2022 cycle	Other 2020 compensation	Total compensation paid, promised or granted 2020
	Currency	Cash (amount)	Amount [1]	Cash (amount)	Equity (value at grant date) [2]	PSUs (target value at grant date) [3]	Amount [4]	Amount [5]
Executive Committee members active on December 31, 2020								
Vasant Narasimhan	CHF	1 743 750	175 102	1 318 275	1 318 275	5 712 549	113 841	10 381 793
Steven Baert	CHF	798 617	167 294	480 000	480 022	1 679 265	85 587	3 690 785
Bertrand Bodson	CHF	634 834	177 088	256 000	256 052	1 152 115	131 745	2 607 834
James Bradner [6]	USD	1 203 654	373 063	768 900	768 963	2 911 862	88 472	6 114 914
Harry Kirsch	CHF	1 063 433	171 930	585 750	585 814	2 769 330	50 294	5 226 551
Shannon Thyme Klinger	CHF	862 500	182 852	525 000	525 005	1 925 517	32 773	4 053 647
Steffen Lang	CHF	758 333	171 130	228 000	684 038	1 367 619	12 918	3 222 037
Klaus Moosmayer	CHF	520 833	184 884	241 500	241 516	840 004	29 496	2 058 233
Richard Saynor	CHF	778 333	190 372	390 000	390 055	1 482 060	1 737 100	4 967 920
Susanne Schaffert	CHF	871 250	173 111	341 445	796 797	2 013 669	581 188	4 777 460
John Tsai	CHF	868 333	182 517	478 500	478 560	2 175 855	104 669	4 288 434
Marie-France Tschudin	CHF	871 250	182 216	437 750	437 791	2 013 669	–	3 942 677
Robert Weltevreden	CHF	634 834	186 392	215 040	399 430	1 152 115	2 925	2 590 735
Total		**11 536 583**	**2 495 208**	**6 219 290**	**7 315 444**	**27 018 132**	**2 965 615**	**57 550 273**

Based on assumption of 100% payout at target. Actual payout (0–200% of target) will be known at the end of the three-year cycle in January 2023

See next page for 2019 comparative figures.

[1] Includes mandatory employer contributions of CHF 8 336 for the CEO and CHF 59 591 for the other Executive Committee members paid by Novartis to governmental social security systems. This amount is out of total employer contributions of CHF 6 088 770 paid in 2020 for all Executive Committee members, and provides a right to the maximum future insured government pension benefit for the Executive Committee members.

[2] The portion of the Annual Incentive delivered in equity is rounded up to the nearest share, based on the closing share price on the grant date (January 20, 2021) of CHF 86.01 per Novartis share and USD 96.92 per ADR.

[3] The amounts represent the underlying share value of the target number of PSUs granted to Executive Committee members for the performance cycle 2020-2022, based on the closing share price on the grant date (January 21, 2020) of CHF 92.89 per Novartis share and USD 95.19 per ADR for all members.

[4] Includes any other perquisites, benefits in kind, and international assignment benefits as per the global mobility policy (e.g., housing, international health insurance, children's school fees, tax equalization)

[5] All amounts are before deduction of the social security contribution and income tax due by the Executive Committee member.

[6] Amounts in USD for James Bradner were converted at a rate of CHF 1.00 = USD 1.0649, which is the average rate used in the Group's 2020 consolidated financial statements.

2019 compensation at grant value for the CEO and other Executive Committee members

For comparative purposes, the table below provides the compensation at grant value for 2019.

Executive Committee member compensation at grant for financial year 2019

		Fixed compensation and pension benefits		Variable compensation				
		Actual compensation paid or granted for 2019				Long-Term Incentive 2019-2021 cycle grants at target		
		2019 annual base salary	2019 pension benefits	2019 Annual Incentive (performance achieved)		LTPP 2019-2021 cycle	Other 2019 compensation	Total compensation paid, promised or granted 2019
	Currency	Cash (amount)	Amount [1]	Cash (amount)	Equity (value at grant date) [2]	PSUs (target value at grant date) [3]	Amount [4]	Amount [5]
Executive Committee members active on December 31, 2019								
Vasant Narasimhan	CHF	1 653 333	165 547	2 008 800	2 008 839	5 440 530	160 452	11 437 501
Steven Baert	CHF	789 750	161 454	633 360	633 417	1 662 585	124 979	4 005 545
Bertrand Bodson	CHF	607 500	170 178	341 040	341 092	974 476	137 826	2 572 111
James Bradner [6]	USD	1 126 781	359 961	951 720	951 805	2 832 511	85 498	6 308 275
Harry Kirsch	CHF	1 053 000	164 467	1 045 044	1 045 105	2 744 591	27 658	6 079 865
Shannon Thyme Klinger	CHF	783 333	188 990	468 000	468 073	1 600 005	111 375	3 619 776
Steffen Lang	CHF	745 000	167 815	408 000	612 145	1 200 026	9 810	3 142 796
Klaus Moosmayer	CHF	500 000	125 483	260 000	260 092	800 047	171 749	2 117 371
Richard Saynor (from July 15, 2019) [7]	CHF	356 021	87 118	179 315	179 371	–	1 950 908	2 752 732
Susanne Schaffert [7]	CHF	850 000	167 096	459 000	1 071 115	1 870 066	160 252	4 577 528
John Tsai	CHF	858 333	181 048	602 000	602 020	2 064 063	377 544	4 685 007
Marie-France Tschudin (from June 7, 2019) [7]	CHF	481 667	92 090	290 630	290 653	968 249	–	2 123 289
Robert Weltevreden	CHF	607 500	157 423	158 340	475 132	974 476	4 860	2 377 731
Subtotal		**10 405 223**	**2 186 434**	**7 799 341**	**8 932 950**	**23 114 040**	**3 322 378**	**55 760 366**
Executive Committee members who stepped down during 2019								
Richard Francis (until March 19, 2019) [8 9]	CHF	179 315	36 025	18 914	37 435	720 460	3 808 445	4 800 594
Paul Hudson (until June 7, 2019) [9 10]	CHF	439 342	74 994	–	–	270 451	2 885 164	3 669 950
Subtotal		**618 657**	**111 018**	**18 914**	**37 435**	**990 910**	**6 693 609**	**8 470 543**
Total		**11 023 880**	**2 297 452**	**7 818 255**	**8 970 384**	**24 104 951**	**10 015 988**	**64 230 910**

Based on assumption of 100% payout at target. Actual payout (0–200% of target) will be known at the end of the three-year cycle in January 2022.

[1] Includes mandatory employer contributions of CHF 4 373 for the CEO and CHF 63 461 for the other Executive Committee members paid by Novartis to governmental social security systems. This amount is out of total employer contributions of CHF 3 923 070 paid in 2019 for all Executive Committee members, and provides a right to the maximum future insured government pension benefit for the Executive Committee member.

[2] The portion of the Annual Incentive delivered in equity is rounded up to the nearest share, based on the closing share price on the grant date (January 21, 2020) of CHF 92.89 per Novartis share and USD 95.19 per ADR.

[3] The amounts represent the underlying share value of the target number of PSUs granted to Executive Committee members for the performance cycle 2019-2021, based on the closing share price on the grant date (January 22, 2019) of CHF 88.14 per Novartis share and USD 88.32 per ADR for all members except for Richard Saynor, who was not part of the Company at the annual grant date and hence did not receive an LTPP award.

[4] Includes any other perquisites, benefits in kind, and international assignment benefits as per the global mobility policy (e.g., housing, international health insurance, children's school fees, tax equalization).

[5] All amounts are before deduction of the social security contribution and income tax due by the Executive Committee member.

[6] Amounts in USD for James Bradner were converted at a rate of CHF 1.00 = USD 1.006, which is the average rate used in the Group's 2019 consolidated financial statements.

[7] For those members who joined the Executive Committee in 2019, the information under the columns "Actual compensation paid or granted for 2019" and "Long-Term Incentive 2019-2021 cycle grants at target" includes their pro-rata compensation from the date they joined the Executive Committee to December 31, 2019, or to the end of the performance cycle in the case of the "Long-Term Incentive 2019-2021 cycle grants at target."

[8] Richard Francis stepped down as CEO, Sandoz on March 19, 2019, and left the Company on March 31, 2020, in line with his contractual notice period. Until the end of the notice period, he received further contractual compensation that includes the base salary, Annual Incentive and pension benefits. In accordance with the plan rules, the LTPP 2019-2021 cycle grant (21 217 PSUs), included in full in the above table, will vest on the normal vesting date pro-rata based on the number of months of Novartis employment during the performance cycle. The vesting of this grant is subject to performance conditions assessed at the end of the period.

[9] For those members leaving the Executive Committee in 2019, the columns under "Actual compensation paid or granted for 2019" and "Long-Term Incentive 2019-2021 cycle grants at target" reflect the pro-rata compensation for their period as Executive Committee member. The column "Other 2019 compensation" includes inter alia their pro-rata compensation from the date they left the Executive Committee to December 31, 2019, or to the end of the performance cycle in the case of the "Long-Term Incentive 2019-2021 cycle grants at target". See "—2019 Executive Committee member departures" for details.

[10] Paul Hudson stepped down as CEO, Novartis Pharmaceuticals on June 7, 2019, and left the Company on August 31, 2019, in line with his reduced contractual notice period (for more details "—2019 Executive Committee member departures.") The Annual Incentive and LTPP 2019 -2021 cycle grant (31 553 PSUs), included in the table above, were forfeited in full upon his departure.

Compensation at grant value for the CEO and other Executive Committee for 2020 compared to 2019
Grant compensation delivered to the CEO decreased slightly by CHF 1.1 million from 2019 to 2020, largely due to the lower Annual Incentive payout, which was partly offset by a 5% increase in annual base salary from March 31, 2020, as reported in Item 6.B of the 2019 Annual Report. There was no change to his target Annual Incentive or his target Long-Term Incentive, as a percentage of annual base salary, in 2020.

Similarly, there is an overall decrease when comparing the 2020 Executive Committee total compensation at grant value of CHF 57. 6 million to the 2019 grant value of CHF 64.2 million. This reduction can be largely explained by the fact that two members stepped down in 2019, whereas no members stepped down in 2020.

Additional disclosures for the CEO and other Executive Committee members

This section provides additional disclosures, including information about the shareholdings of the CEO and the other Executive Committee members.

Malus and clawback

Per our "—Executive Committee compensation philosophy and principles," in 2020, there was no legal or factual basis on which to exercise malus or clawback for current or former Executive Committee members.

Number of equity instruments granted to the CEO and other Executive Committee members for financial year 2020

	Variable compensation[1]		
	2020 Annual Incentive (performance achieved)	LTPP 2020-2022 cycle	Other
	Equity (number)[2]	PSUs (target number)[3]	Equity/PSUs (number)
Executive Committee members active on December 31, 2020			
Vasant Narasimhan	15 327	61 498	0
Steven Baert	5 581	18 078	0
Bertrand Bodson	2 977	12 403	0
James Bradner	7 934	30 590	0
Harry Kirsch	6 811	29 813	0
Shannon Thyme Klinger	6 104	20 729	0
Steffen Lang	7 953	14 723	0
Klaus Moosmayer	2 808	9 043	0
Richard Saynor	4 535	15 955	0
Susanne Schaffert	9 264	21 678	0
John Tsai	5 564	23 424	0
Marie-France Tschudin	5 090	21 678	0
Robert Weltevreden	4 644	12 403	0
Total	**84 592**	**292 015**	**0**

See next page for 2019 comparative figures.

[1] The values of the awards are reported in the table "2020 compensation at grant value for the CEO and other Executive Committee members."

[2] Vested shares, restricted shares and/or RSUs granted under the Annual Incentive for performance period 2020.

[3] Target number of PSUs granted under the LTPP as applicable for the performance cycle 2020-2022.

Number of equity instruments granted to the CEO and other Executive Committee members for financial year 2019 (comparative information)

	Variable compensation[1]		
	2019 Annual Incentive (performance achieved)	LTPP 2019-2021 cycle	Other
	Equity (number)[2]	PSUs (target number)[3]	Equity/PSUs (number)
Executive Committee members active on December 31, 2019			
Vasant Narasimhan	21 626	61 726	0
Steven Baert	6 819	18 863	0
Bertrand Bodson	3 672	11 056	0
James Bradner	9 999	32 071	0
Harry Kirsch	11 251	31 139	0
Shannon Thyme Klinger	5 039	18 153	0
Steffen Lang	6 590	13 615	0
Klaus Moosmayer	2 800	9 077	0
Richard Saynor (from July 15, 2019)[4]	1 931	0	11 452
Susanne Schaffert	11 531	21 217	0
John Tsai	6 481	23 418	0
Marie-France Tschudin (from June 7, 2019)[4]	3 129	11 085	0
Robert Weltevreden	5 115	11 056	0
Subtotal	**95 983**	**262 476**	**11 452**
Executive Committee members who stepped down during 2019			
Richard Francis (until March 19, 2019)[5, 6]	403	8 841	0
Paul Hudson (until June 7, 2019)[5, 7]	0	4 525	0
Subtotal	**403**	**13 366**	**0**
Total	**96 386**	**275 842**	**11 452**

[1] The values of the awards are reported in the table "2019 compensation at grant value for the CEO and other Executive Committee members."
[2] Vested shares, restricted shares and/or RSUs granted under the Annual Incentive for performance period 2019.
[3] Target number of PSUs granted under the LTPP as applicable for the performance cycle 2019-2021.
[4] For those members who joined the Executive Committee in 2019, the information under the column "Variable compensation" includes their pro-rata number of equity instruments from the date they joined the Executive Committee to December 31, 2019, or to the end of the performance cycle in the case of the "LTPP 2019-2021 cycle."
[5] For those members leaving the Executive Committee in 2019, the column under "Variable compensation" reflects the pro-rata number of equity instruments for their period as Executive Committee member. The column "Other" includes their pro-rata compensation from the date they left the Executive Committee to December 31, 2019, or to the end of the performance cycle in the case of the "LTPP 2019-2021 cycle." See "2019 Executive Committee member departures" for details.
[6] Richard Francis stepped down as CEO, Sandoz on March 19, 2019, and left the Company on March 31, 2020, in line with his contractual notice period. In accordance with the plan rules, the LTPP 2019-2021 cycle grant (21 217 PSUs), included in full in the above table, will vest on the normal vesting date pro-rata based on the number of months of Novartis employment during the performance cycle. The vesting of this grant is subject to performance conditions assessed at the end of the period.
[7] Paul Hudson stepped down as CEO, Novartis Pharmaceuticals on June 7, 2019, and left the Company on August 31, 2019, in line with his reduced contractual notice period (for more details "—2019 Executive Committee member departures"). The 2019 Annual Incentive and LTPP 2019-2021 cycle grant (31 553 PSUs), included in the table above, were forfeited in full upon his departure.

Share ownership requirements for the CEO and other Executive Committee members

Executive Committee members are required to own at least a minimum multiple of their annual base salary in Novartis shares or RSUs within five years of hire or promotion, as set out in the table below. In addition, the CEO and CFO are required to hold the equity vesting under the LTPP plan (granted since 2020) for a minimum of two years after the vesting date. In the event of a substantial rise or drop in the share price, the Board of Directors may, at its discretion, amend that time period accordingly.

FUNCTION	OWNERSHIP LEVEL
CEO	5 x base compensation
Other Executive Committee members	3 x base compensation

The determination of equity amounts against the share ownership requirements is defined to include vested and unvested Novartis shares or American Depositary Receipts (ADRs), and RSUs acquired under the Company's compensation plans. However, unvested matching shares granted under former matching programs, such as the Leveraged Share Savings Plan (LSSP), and any unvested PSUs are excluded. The determination also includes other shares and vested options of Novartis shares or ADRs that are owned directly or indirectly by "persons closely linked" to an Executive Committee member. The Compensation Committee reviews compliance with the share ownership guideline on an annual basis.

Shares, ADRs and other equity rights owned by Executive Committee members at December 31, 2020[1]

The following table shows, in alphabetical order after the CEO, the total number of shares, ADRs and other equity rights owned by the CEO and the other Executive Committee members and "persons closely linked" to them as of December 31, 2020. As of December 31, 2020, no members of the Executive Committee, either individually or together with "persons closely linked" to them, owned 1% or more of the outstanding shares or ADRs of Novartis. As of December 31, 2020, all members who have served at least five years on the Executive Committee have met or exceeded their personal Novartis share ownership requirements.

	Vested shares and ADRs[1]	Unvested shares and other equity rights[2]	Equity ownership level as a multiple of annual base salary[3]	Unvested target PSUs (e.g., LTPP/LTRPP)[4]	Matching shares under the LSSP[5]	**Total at December 31, 2020**
Vasant Narasimhan	104 277	90 466	9x	159 962	3 342	358 047
Steven Baert	69 679	28 773	10x	51 501	0	149 953
Bertrand Bodson	10 403	9 869	2x	24 193	0	44 465
James Bradner	69 551	41 274	8x	83 724	0	194 549
Harry Kirsch	198 331	37 457	18x	82 446	0	318 234
Shannon Thyme Klinger	29 128	23 248	5x	37 547	1 884	91 807
Steffen Lang	81 714	26 413	11x	31 543	3 726	143 396
Klaus Moosmayer	6 011	5 824	1x	16 153	0	27 988
Richard Saynor	0	13 746	1x	9 578	0	23 324
Susanne Schaffert	106 981	30 548	13x	45 844	0	183 373
John Tsai	17 783	28 981	4x	32 896	0	79 660
Marie-France Tschudin	12 300	29 212	3x	46 636	0	88 148
Robert Weltevreden	2 734	12 395	1x	30 050	0	45 179
Total	**708 892**	**378 206**		**652 073**	**8 952**	**1 748 123**

[1] Includes holdings of "persons closely linked" to Executive Committee members (see definition "Persons closely linked")
[2] Includes unvested shares and ADRs as well as other equity rights applicable for the determination of equity amounts for the share ownership requirements, as per the definition above. Also includes unvested Alcon Keep Whole shares received in connection to the Alcon spin-off.
[3] The multiple is calculated based on the full-year annual base salary and the closing share price as at the end of the 2020 financial year. The share price on the final trading day of 2020 was CHF 83.65 / USD 94.43 as at December 31, 2020.
[4] The target number of PSUs is disclosed pro-rata to December 31, 2020, unless the award qualified for full vesting under the relevant plan rules.
[5] Matching shares under the Leveraged Share Savings Plan (LSSP) are disclosed pro-rata to December 31, 2020, unless the award qualified for full vesting under the plan rules. LSSP participation for Executive Committee members ceased in 2014, although some current members received later grants under this plan prior to becoming members of the Executive Committee. Outstanding awards will vest five years from the grant date, subject to the LSSP plan rules.

Fixed and variable compensation

The CEO and other Executive Committee members' annual base salary and variable compensation mix at grant value for financial year 2020:

	Annual base salary[1]	Variable compensation[2]
Vasant Narasimhan	17.1%	82.9%
Steven Baert	22.7%	77.3%
Bertrand Bodson	26.1%	73.9%
James Bradner	21.0%	79.0%
Harry Kirsch	21.0%	79.0%
Shannon Thyme Klinger	22.3%	77.7%
Steffen Lang	24.9%	75.1%
Klaus Moosmayer	27.8%	72.2%
Richard Saynor	16.3%	83.7%
Susanne Schaffert	18.9%	81.1%
John Tsai	21.1%	78.9%
Marie-France Tschudin	23.2%	76.8%
Robert Weltevreden	26.4%	73.6%
Total	**21.0%**	**79.0%**

[1] Excludes pension and other benefits.
[2] See the table "2020 compensation at grant value for the CEO and other Executive Committee members" with regard to the disclosure principles of variable compensation.

Other payments to Executive Committee members

During 2020, no other payments or waivers of claims other than those set out in the tables (including their footnotes) contained in this Compensation Report were made to Executive Committee members or to "persons closely linked" to them.

Payments to former Executive Committee members

Under the former Executive Committee members' contracts and in line with the Company's LTI plan rules, payments were made to 8 former members. Of this, CHF 11 559 192 relates to the vesting of the LTPP and LTRPP for the 2018-2020 performance cycle and the vesting of buyout awards. In addition, contractual amounts totaling 643 065 were made (comprising base salary, the Annual Incentive and other benefits), and 3 individuals received CHF 3 147 567 in tax equalization on incentive compensation granted during an international assignment.

No other payments (or waivers of claims) were made to former Executive Committee members or to "persons closely linked" to them during 2020.

Loans to Executive Committee members

Our policy does not allow loans to be granted to current or former members of the Executive Committee or to "persons closely linked" to them. Therefore, no loans were granted in 2020, and none were outstanding as of December 31, 2020.

Persons closely linked

"Persons closely linked" are (i) their spouse, (ii) their children below age 18, (iii) any legal entities that they own or otherwise control, and (iv) any legal or natural person who is acting as their fiduciary.

Note 27 to the Group's audited consolidated financial statements

The total expense for the year for compensation awarded to Executive Committee and Board members, using International Financial Reporting Standards (IFRS) measurement rules, is presented in Note 27 to the Group's audited consolidated financial statements.

Award and delivery of equity to Novartis associates

During 2020, 14.7 million unvested restricted shares (or ADRs), RSUs and target PSUs were granted, and 13.8 million Novartis vested shares (or ADRs) were delivered to Novartis associates under various equity-based participation plans. Current unvested equity instruments (restricted shares, RSUs and target PSUs) and outstanding equity options held by associates represent 1.38% of issued shares. Novartis delivers treasury shares to associates to fulfill these obligations, and aims to offset the dilutive impact from its equity-based participation plans.

Interim update regarding ongoing LTI performance cycles

Below we report how performance is tracking against target for our ongoing LTI performance cycles.

2019-2021 LTPP

This will be the first cycle vesting under the new system of four equally weighted measures: net sales CAGR, core operating income CAGR, innovation and relative TSR. After the first two years of the three-year LTI performance cycle, net sales CAGR is tracking above target despite a slowdown in sales in 2020, due to a significant over-delivery in 2019. Core operating income is exceeding expectations and is currently above target. Innovation for the cycle is currently tracking at target, with a number of target filings already achieved. Forecasts at the end of December place the Novartis relative TSR at median among our global healthcare peer group.

PERFORMANCE MEASURES	TRACKING
Net sales growth CAGR (25%)	Above target
Core operating income CAGR (25%)	Above target
Innovation (25%)	At target
Relative TSR (25%)	At median

CAGR = compound annual growth rate

2020-2022 LTPP

After the first year of the three-year performance cycle, net sales CAGR is tracking below target. This is largely due to the impact of the pandemic on our sales execution. Core operating income CAGR is tracking above target, mainly driven by gross margin improvements and lower-than-planned function costs. Innovation is tracking at target, against the selected development projects in Innovative Medicines published in Item 4.B of this report. Relative TSR is currently positioned 11 out of a peer group of 15 (including Novartis).

PERFORMANCE MEASURES	TRACKING
Net sales growth CAGR (25%)	Below target
Core operating income CAGR (25%)	Above target
Innovation (25%)	At target
Relative TSR (25%)	Below median

CAGR = compound annual growth rate

2021 Executive Committee compensation

Executive Committee member appointments and departures

Appointment of Head of Customer & Technology Solutions – Robert Weltevreden
Robert Weltevreden joined the Executive Committee on June 1, 2018 as Head of Novartis Business Services (NBS). Effective February 1, 2021, the Digital function will be merged with NBS to form a new Customer and Technology Solutions unit, which Mr. Weltevreden has been appointed to lead. Effective March 1, 2021, Mr. Weltevreden will receive an annual base salary of CHF 680 000, a target Annual Incentive of 80%, and a target Long-Term Incentive of 190%. This represents an increase in annual base salary of 6.3% and a 10% increase in target LTI, as a percentage of his annual base salary. There is no change to his target Annual Incentive.

Departure of Chief Digital Officer – Bertrand Bodson
Mr. Bodson will step down from the Executive Committee on February 1, 2021. Mr. Bodson will be treated as a good leaver for compensation purposes in line with the policy outlined in the "—Treatment of variable compensation for Executive Committee leavers". During his contractual notice period, which ends on January 31, 2022, he will receive his annual base salary, benefits and Annual Incentive at target level in accordance with the Annual Incentive plan rules. He did not receive a Long-Term Performance Plan grant in January 2021 for the 2021-2023 performance cycle.

Mr. Bodson's unvested Long-Term Incentives for outstanding performance cycles will be pro-rated for time employed during the three-year performance periods. In line with the plan rules, there will be no accelerated vesting, as awards will remain subject to performance over the full cycle. Clawback and malus, and non-compete restrictions as defined by the plan rules will apply. No severance or non-compete payments will be made.

2021 Executive Committee member compensation increases

As outlined in "—Executive Committee appointments compensation policy," some members were appointed with total target compensation below external market median level. Each year, we collaborate with our advisors to benchmark the compensation levels of the members of the Executive Committee. Taking the current climate of the pandemic into consideration, while bearing in mind the need to ensure our competitiveness in a global competitive talent market, the following members will receive an increase in total target compensation for 2021, in line with their demonstrated performance and ability in their respective roles.

Steffen Lang, Head of Novartis Technical Operations
Steffen Lang led the manufacturing and supply chain function to a very strong financial and operational performance in 2020. Highlights included the uninterrupted supply during the pandemic, the further improvement of our manufacturing network utilization and footprint, the upscaling of data and digital technologies in NTO and an outstanding improvement in our environmental impact. Effective March 1, 2021, Mr. Lang will receive an annual base salary increase of 3.3% and an increase in target Annual Incentive of 10%, as a percentage of annual base salary. He will also receive a target Long-Term Incentive (LTI) increase of 20%, as a percentage of annual base salary.

Klaus Moosmayer, Chief Ethics, Risk and Compliance Officer
Having joined Novartis in December 2018, Mr. Moosmayer is a globally recognized leader in compliance and risk management. He plays a key role in Novartis trust with society priority. Mr. Moosmayer is leading the roll-out of the Code of Ethics and advancing our Third Party Risk Management practice as well as coordinating our COVID-19 risk management, enabling the organization to function seamlessly. Effective March 1, 2021, Mr. Moosmayer will receive an annual base salary increase of 9.5% and a 20% increase in target LTI, as a percentage of annual base salary.

Another two ECN members will receive a 10% increase for their LTI target 2021-2023 (in addition to an annual base salary increase in line with local market increases), leading to an overall increase in target compensation not exceeding 3%. The LTI is subject to three-year performance conditions and provides for an overall payout between 0% and 200%.

All other Executive Committee members, including the CEO, were awarded annual base salary increases in line with the annual compensation review applicable to all associates in Switzerland and, where applicable, the US.

Implementation of a Global Employee Share Plan

In 2020, the Board of Directors approved the implementation of a global Employee Share Purchase Plan (ESPP). Novartis aims to launch in country waves over the next five years, which will provide associates, including Executive Committee members, the option to invest up to 15% of their base salary (capped at USD 25 000) to purchase Novartis shares at a 15% discount. The shares purchased under this plan will be subjected to a minimum mandatory two-year holding period.

2020 Board compensation

Philosophy and benchmarking

Aligned with market practice in Switzerland, the Board of Directors sets compensation for its members at a level that allows for the attraction of high-caliber individuals, including both Swiss and international members, who have global experience.

Board members do not receive variable compensation, in line with their focus on corporate strategy, supervision and governance. Each year at the AGM, shareholders are requested to approve, in a binding vote, the total compensation of the Board of Directors until the following AGM.

The Board of Directors sets the level of compensation for its Chairman and the other members to be in line with relevant benchmark companies, which include other large Switzerland-based multinational companies: ABB, Credit Suisse, Lafarge Holcim, Nestlé, Roche and UBS. This peer group was chosen for Board compensation due to the comparability of Swiss legal requirements, including broad personal and individual liabilities under Swiss law (and new criminal liability under Swiss rules regarding board and executive committee compensation related to the Ordinance against Excessive Compensation in Listed Companies), and under US law (due to the Company's secondary listing on the New York Stock Exchange). The Board of Directors reviews the compensation of its members, including the Chairman, each year based on a proposal by the Compensation Committee and on advice from its independent advisor, including relevant benchmarking information. The peer group used for the Board of Directors is different than that used for the Executive Committee to ensure independence of decision-making.

The Chairman's contract and the Board of Directors compensation policy do not provide for any termination-related payments.

Chairman of the Board

As Chairman, Joerg Reinhardt receives total annual compensation valued at CHF 3.8 million. The total compensation is comprised equally of cash and shares, as follows:

- Cash compensation: CHF 1.9 million per year
- Share compensation: annual value equal to CHF 1.9 million of unrestricted Novartis shares

For 2020, the Chairman voluntarily waived the increase in compensation to which he is contractually entitled, which is an amount not lower than the average annual compensation increase awarded to associates based in Switzerland (0.8% for 2020).

Other Board members

The annual fee rates for Board membership and additional functions are included in the table below. These were approved by the Board of Directors with effect from the 2020 AGM. Aggregate Board compensation is aligned with other large Swiss companies.

CHF 000s	2020-2021 AGM annual fee
Chairman of the Board	3 800
Board membership	280
Vice Chairman	50
Chair of the Audit and Compliance Committee	130
Chair of the Compensation Committee	90
Chair of the following committees: • Governance, Nomination and Corporate Responsibilities Committee • Science & Technology Committee • Risk Committee	70
Membership of the Audit and Compliance Committee	70
Membership of the following committees: • Compensation Committee • Governance, Nomination and Corporate Responsibilities Committee • Science & Technology Committee • Risk Committee	40

In addition, the following policies apply regarding Board compensation:

- 50% of compensation is delivered in cash, paid on a quarterly basis in arrears. Board members may choose to receive more of their compensation in shares instead of cash.
- At least 50% of compensation is delivered in shares in two installments: one six months after the AGM, and one 12 months after the AGM.

Board members bear the full cost of their employee social security contributions, if any, and do not receive share options or pension benefits.

2021 Board compensation

In 2020, the Compensation Committee reviewed, with its independent advisor, the Board of Directors' compensation system against the Swiss Market Index.

They found that the Chairman and retainer fees of the other Board members are well positioned and competitive among the benchmarked companies in relation to the Company's size, operational complexity and corporate headquarters location. The Board of Directors compensation system and fee levels will therefore remain unchanged in 2021.

The Lead Independent Director Role is currently combined with the Vice Chair role, and no additional compensation will be paid. It is expected that the Lead Independent Director role will evolve going forward and compensation for this role will be kept under review.

Board member total compensation earned for the financial year 2020

	Board membership	Audit and Compliance Committee	Compensation Committee	Governance, Nomination and Corporate Responsibilities Committee	Science & Technology Committee	Risk Committee	Shares (number) [1]	Cash (CHF) (A)	Shares (CHF) (B)	Other (CHF) (C) [2]	Total (CHF) (A)+(B)+(C) [3]
Board members active on December 31, 2020											
Joerg Reinhardt [4]	Chair				Chair		22 629	1 900 000	1 900 000	4 501	3 804 501
Enrico Vanni	Vice Chair	•	Chair	•			3 156	265 000	265 000	3 614	533 614
Nancy C. Andrews	•				•	•	2 143	180 000	180 000	–	360 000
Ton Buechner	•	•				•	3 508	29 167	354 167	4 501	387 835
Patrice Bula	•		•				2 750	133 333	186 666	4 501	324 500
Srikant Datar	•	•	•			Chair	3 348	153 333	306 666	–	459 999
Elizabeth Doherty	•	Chair				•	3 424	131 250	318 750	–	450 000
Ann Fudge	•			•	•		2 249	183 333	183 333	–	366 666
Bridgette Heller [5]	•		•				1 059	133 333	133 333	–	266 666
Frans van Houten	•				•		3 810	–	320 000	–	320 000
Simon Moroney [5]	•				•		1 059	133 333	133 333	4 501	271 167
Andreas von Planta	•	•		Chair		•	2 739	230 000	230 000	4 501	464 501
Charles L. Sawyers	•			•	•		2 143	180 000	180 000	–	360 000
William T. Winters	•		•	• [5]			4 287	–	360 000	–	360 000
Subtotal							**58 304**	**3 652 082**	**5 051 248**	**26 118**	**8 729 448**

See next page for 2019 comparative figures.

[1] The shown amounts represent the gross number of shares delivered to each Board member in 2020 for the respective Board member's service period. The number of shares reported in this column represent: (i) the second and final equity installment delivered in February 2020 for the services from the 2019 AGM to the 2020 AGM, and (ii) the first of two equity installments delivered in August 2020 for the services from the 2020 AGM to the 2021 AGM. The second and final equity installment for the services from the 2020 AGM to the 2021 AGM will take place in February 2021.

[2] Includes an amount of CHF 26 118 for mandatory employer contributions for all Board members paid by Novartis to governmental social security systems. This amount is out of total employer contributions of CHF 430 023 , and provides a right to the maximum future insured government pension benefit for the Board member.

[3] All amounts are before deduction of the social security contribution and income tax due by the Board member.

[4] No additional committee fees for chairing the Science & Technology Committee were delivered to Joerg Reinhardt.

[5] From February 28, 2020.

Board member total compensation earned for the financial year 2019

	Board membership	Audit and Compliance Committee	Compensation Committee	Governance, Nomination and Corporate Responsibilities Committee	Research & Development Committee	Risk Committee	Shares (number) [1]	Cash (CHF) (A)	Shares (CHF) (B)	Other (CHF) (C) [2]	Total (CHF) (A)+(B)+(C) [3]
Board members active on December 31, 2019											
Joerg Reinhardt [4]	Chair				Chair		21 498	1 900 000	1 900 000	4 373	3 804 373
Enrico Vanni	Vice Chair	•	Chair	•			4 494	220 833	309 166	3 512	533 511
Nancy Andrews	•				•	•	2 035	180 000	180 000	–	360 000
Ton Buechner	•	•					2 967	145 833	204 166	4 373	354 372
Patrice Bula [5]	•		•				1 813	–	266 667	4 373	271 040
Srikant Datar	•	•	•			Chair	2 602	230 000	230 000	–	460 000
Elizabeth Doherty	•	Chair				•	2 544	225 000	225 000	–	450 000
Ann Fudge	•		•	•		•	2 262	200 000	200 000	–	400 000
Frans van Houten	•				•		2 716	26 667	293 334	–	320 001
Andreas von Planta	•	•		Chair		•	2 602	230 000	230 000	4 373	464 373
Charles L. Sawyers	•			•	•		2 035	180 000	180 000	–	360 000
William T. Winters	•		•	• [5]			3 620	–	353 333	–	353 333
Total							**51 188**	**3 538 333**	**4 571 666**	**21 002**	**8 131 001**

[1] The shown amounts represent the gross number of shares delivered to each Board member in 2019 for the respective Board member's service period. The number of shares reported in this column represent: (i) the second and final equity installment delivered in February 2019 for the services from the 2018 AGM to the 2019 AGM, and (ii) the first of two equity installments delivered in August 2019 for the services from the 2019 AGM to the 2020 AGM.
[2] Includes an amount of CHF 21 002 for mandatory employer contributions for all Board members paid by Novartis to governmental social security systems. This amount is out of total employer contributions of CHF 413 985 , and provides a right to the maximum future insured government pension benefit for the Board member.
[3] All amounts are before deduction of the social security contribution and income tax due by the Board member.
[4] No additional committee fees for chairing the Research & Development Committee were delivered to Joerg Reinhardt.
[5] From February 28, 2019.
[6] Until February 28, 2019.

Additional disclosures

Share ownership requirements for Board members

The Chairman is required to own a minimum of 30 000 Novartis shares, and other members of the Board of Directors are required to own at least 5 000 Novartis shares within five years after joining the Board of Directors, to ensure their interests are aligned with those of shareholders.

Board members are prohibited from hedging or pledging their ownership positions in Novartis shares that are part of their guideline share ownership requirement, and are required to hold these shares for 12 months after retiring from the Board of Directors. As of December 31, 2020, all current and former members of the Board of Directors who were required to meet the minimum share ownership requirements did so.

Shares, ADRs and share options owned by Board members

The total number of vested Novartis shares and ADRs owned by members of the Board of Directors and "persons closely linked" to them as of December 31, 2020, is shown in the table below. As of December 31, 2020, no members of the Board, either individually or together with "persons closely linked" to them, owned 1% or more of the outstanding shares (or ADRs) of Novartis. As of the same date, no members of the Board of Directors held any share options to purchase Novartis shares.

	Number of shares at December 31, 2020[1,2]
Joerg Reinhardt	586 326
Enrico Vanni	28 847
Nancy C. Andrews	8 872
Ton Buechner	14 338
Patrice Bula	4 621
Srikant Datar	43 845
Elizabeth Doherty	8 744
Ann Fudge	15 201
Bridgette Heller	794
Frans van Houten	7 621
Simon Moroney	731
Andreas von Planta	163 834
Charles L. Sawyers	12 593
William T. Winters	21 289
Total	**917 656**

[1] Includes holdings of "persons closely linked" to Board members (see definition "Persons closely linked").
[2] Each share provides entitlement to one vote.

Loans to Board members

Our policy does not allow loans to be granted to current or former members of the Board of Directors or to "persons closely linked" to them. Therefore, no loans were granted in 2020, and none were outstanding as of December 31, 2020.

Other payments to Board members

During 2020, no payments (or waivers of claims) other than those set out in the Board member compensation table titled "Board member total compensation earned for the financial year 2020" (including its footnotes) were made to current members of the Board or to "persons closely linked" to them.

Payments to former Board members

During 2020, no payments (or waivers of claims) were made to former Board members or to "persons closely linked" to them, except for the payments reported in Note 27 to the Group's audited consolidated financial statements.

Compensation governance

Legal framework

The Swiss Code of Obligations and the Corporate Governance Guidelines of the SIX Swiss Exchange require listed companies to disclose certain information about the compensation of Board of Directors and Executive Committee members, their equity participation in the Group, and loans made to them. This Annual Report fulfills that requirement. In addition, the Annual Report is in line with the principles of the Swiss Code of Best Practice for Corporate Governance of the Swiss Business Federation (economiesuisse).

Risk management principles

The Compensation Committee, with support from its independent advisor, reviews market trends in compensation, and changes in corporate governance rules and best practices. Together with the Risk Committee, it also reviews the Novartis compensation systems to ensure that they do not encourage inappropriate or excessive risk-taking, and instead encourage behaviors that support sustainable value creation. A summary of the risk management principles is outlined below.

RISK MANAGEMENT PRINCIPLES

- Rigorous performance management process, with approval of targets and evaluation of performance for the CEO by the Board of Directors
- Balanced mix of short-term and long-term variable compensation elements
- Values and Behaviors are a key component of the Annual Incentive and are embedded in our culture
- Clawback and malus principles apply to all elements of the variable compensation
- Performance-vesting Long-Term Incentives only, with three-year cycles
- All variable compensation is capped at 200% of target
- Contractual notice period of 12 months
- Post-contractual non-compete period limited to a maximum of 12 months from the end of employment. Resulting compensation is limited to the annual base salary plus the prior-year Annual Incentive as per contract, if applicable
- Good and bad leaver provisions apply to variable compensation of leavers
- No severance payments or change-of-control clauses
- Share ownership requirements; no hedging or pledging of Novartis share ownership

Executive Committee employment contracts provide for a notice period of up to 12 months and contain no change-of-control clauses or severance provisions (for example, agreements concerning special notice periods, longer-term contracts, "golden parachutes," waiver of lockup periods for equities and bonds, shorter vesting periods, and additional contributions to occupational pension schemes). For share ownership requirements, please refer to "—Share ownership requirements for the CEO and other Executive Committee members."

Compensation decision-making authorities

Authority for decisions related to compensation is governed by the Articles of Incorporation, Board Regulations and the Compensation Committee Charter, which are all published on the Company website: www.novartis.com/investors/company-overview/corporate-governance. The Compensation Committee serves as the supervisory and governing body for compensation policies and plans within Novartis, and has overall responsibility for determining, reviewing and proposing compensation policies and plans for approval by the Board of Directors in line with the Compensation Committee Charter. A summary of discussions and conclusions of each committee meeting is delivered to the full Board of Directors. A summary of the compensation decision-making authorities is set out below.

Compensation authorization levels within the parameters set by the shareholders' meeting

DECISION ON	DECISION-MAKING AUTHORITY
Compensation of Chairman and other Board members	Board of Directors
Compensation of CEO	Board of Directors
Compensation of other Executive Committee members	Compensation Committee

Committee member independence

The Compensation Committee is composed exclusively of members of the Board of Directors who meet the independence criteria set forth in the Board Regulations. From the 2020 AGM, the Compensation Committee had the following five members: Patrice Bula, Bridgette Heller (from the 2020 AGM), Srikant Datar, Enrico Vanni and William Winters. Simon Moroney also attended each Compensation Committee meeting after the 2020 AGM as a permanent guest. Mr. Vanni has served as a member since 2011 and as Chair since 2012.

Role of the Compensation Committee's independent advisor

The Compensation Committee retained Mercer Limited during the financial year 2020 as its independent external compensation advisor to support the committee in determining the design and implementation of compensation and benefits. The advisor was hired directly by the Compensation Committee in 2017, and the Compensation Committee has been fully satisfied with the performance and independence of the advisor since its engagement. In determining whether to renew the engagement with the advisor, the Compensation Committee evaluates, at least annually, the quality of the consulting service, the independence of the advisor, and the benefits of rotating advisors. Mercer Limited also provides services related to management development at the mid- and frontline leader level and in respect of corporate pensions. The individual Mercer Limited consultants who advise and support the committee are not responsible or rewarded for work beyond support to the Compensation Committee and the People & Organization function on senior compensation.

Meetings held in 2020 and self-evaluation

In 2020, the Compensation Committee held six formal meetings. In line with prior years, it collaborated with the Science & Technology Committee to review and endorse for approval by the Board of Directors the innovation targets and achievements of the Annual Incentive and LTPP. The assessment of the Compensation Committee was included in the Board's overall 2020 self-evaluation.

Report of the statutory auditor on the Compensation Report of Novartis AG

To the General Meeting of Novartis AG, Basel

We have audited the 2020 realized compensation for the CEO and other Executive Committee members on pages 105-108, the 2020 compensation at grant value for the CEO and other Executive Committee members on pages 109-111, and additional disclosures for the CEO and other Executive Committee members on pages 112-115, as well as the 2020 Board Compensation on pages 119-121 and the additional disclosures on page 122; of the accompanying Compensation Report of Novartis AG for the year ended December 31, 2020; hereinafter referred to as "disclosures made on the pages defined as subject to audit".

Board of Directors' responsibility
The Board of Directors is responsible for the preparation and overall fair presentation of the Compensation Report in accordance with Swiss law and the Ordinance against Excessive Compensation in Stock Exchange Listed Companies (Ordinance). The Board of Directors is also responsible for designing the remuneration system and defining individual remuneration packages.

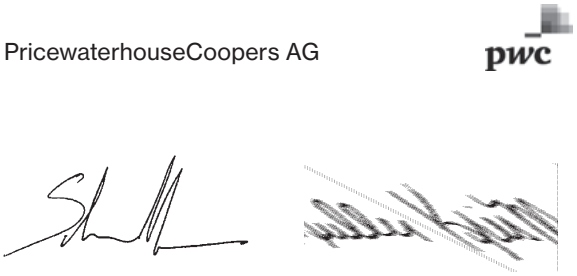
Auditor's responsibility
Our responsibility is to express an opinion on the accompanying disclosures made on the pages defined as subject to audit. We conducted our audit in accordance with Swiss Auditing Standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the disclosures made on the pages defined as subject to audit comply with Swiss law and articles 14–16 of the Ordinance.

An audit involves performing procedures to obtain audit evidence on the disclosures made on the pages defined as subject to audit with regard to compensation, loans and credits in accordance with articles 14–16 of the Ordinance. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatements in the disclosures made on the pages defined as subject to audit, whether due to fraud or error. This audit also includes evaluating the reasonableness of the methods applied to value components of remuneration, as well as assessing the overall presentation of the disclosures made on the pages defined as subject to audit.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Opinion
In our opinion, the disclosures made on the pages defined as subject to audit of the accompanying Compensation Report of Novartis AG for the year ended December 31, 2020 comply with Swiss law and articles 14–16 of the Ordinance.

PricewaterhouseCoopers AG



Luc Schulthess
Audit expert
Auditor in charge

Kris Muller
Global relationship partner

Basel, January 25, 2021

6.C Board practices

Corporate governance

Framework

Novartis is committed to effective corporate governance, and our corporate governance framework is intended to support sustainable financial performance and long-term value creation for our shareholders, patients, employees and other stakeholders based on our Values and Behaviors.

The Novartis corporate governance principles are further described in key governance documents, in particular in our Articles of Incorporation and the Regulations of the Board, the Board Committees and the Executive Committee (Board Regulations) (www.novartis.com/investors/company-overview/corporate-governance). The Governance, Nomination and Corporate Responsibilities Committee (GNCRC) regularly reviews both the corporate governance principles and the key governance documents against evolving best practice standards and new developments in line with our commitment to maintaining the highest standards.

Governance bodies

GENERAL MEETING OF SHAREHOLDERS

Approves operating and financial review, Novartis Group consolidated financial statements, and financial statements of Novartis AG; decides appropriation of available earnings and dividend; approves compensation of Board and Executive Committee; elects Board members, Chairman, Compensation Committee members, Independent Proxy and external auditor; adopts and modifies Articles of Incorporation

BOARD OF DIRECTORS

- AUDIT AND COMPLIANCE COMMITTEE
- COMPENSATION COMMITTEE
- GOVERNANCE, NOMINATION AND CORPORATE RESPONSIBILITIES COMMITTEE
- RISK COMMITTEE
- SCIENCE & TECHNOLOGY COMMITTEE

Sets strategic direction of Novartis, appoints and oversees key executives, approves major transactions and investments

EXECUTIVE COMMITTEE

Responsible for operational management of Novartis

EXTERNAL AUDITOR

Provides opinion on compliance of Novartis Group consolidated financial statements and the financial statements of Novartis AG with applicable standards and Swiss law, on compliance of the Compensation Report with applicable law, on effectiveness of internal controls over financial reporting, and on the corporate responsibility reporting of Novartis

Group structure and shareholders

Group structure

Novartis AG and Group companies

Novartis AG, the Group's holding company, is a corporation organized under Swiss law with issued registered shares and registered office at Lichtstrasse 35, CH-4056 Basel, Switzerland.

The principal subsidiaries and associated companies of the Novartis Group are shown in "Item 18. Financial Statements—Note 32. Principal Group subsidiaries and associated companies."

Divisions

Novartis has two focused, customer-facing divisions: Innovative Medicines, which includes the Novartis Pharmaceuticals and Novartis Oncology business units; and Sandoz, the generics and biosimilars division. The divisions are supported by the Novartis Institutes for BioMedical Research (NIBR), Global Drug Development (GDD), Novartis Technical Operations (NTO), Novartis Business Services (NBS) and corporate functions. A detailed review of the 2020 business results can be found in "Item 18. Financial Statements—Note 3. Segmentation of key figures 2020, 2019 and 2018."

Shareholdings

Majority holdings in publicly traded Group companies

The Novartis Group owns 70.7% of Novartis India Ltd., with registered office in Mumbai, India, and listing on the Bombay Stock Exchange (ISIN INE234A01025, symbol: HCBA). The total market value of the 29.3% free float of Novartis India Ltd. was USD 67.8 million on December 31, 2020, using the quoted market share price at year-end. Applying this share price to all the shares of the company, the market capitalization of the whole company was USD 231.4 million, and that of the shares owned by Novartis was USD 163.6 million.

Significant minority shareholding owned by the Group

The Novartis Group owns 33.3% of the bearer shares of Roche Holding AG, with registered office in Basel, Switzerland, and listing on the SIX Swiss Exchange (ISIN CH0012032113, symbol: RO). The market value of the Group's interest in Roche Holding AG, as of December 31, 2020, was USD 18.8 billion. The total market value of Roche Holding AG was USD 302.8 billion. Novartis does not exercise control over Roche Holding AG, which is independently governed, managed and operated.

Shareholders

Significant shareholders

According to the Share Register, as of December 31, 2020, the following registered shareholders, including nominees and the American Depositary Share (ADS) depositary, held more than 2% of the total share capital, with the right to vote all their shares based on exemptions granted by the Board of Directors ("Board") (see "—Item 6.C Board practices—Shareholder participation—Voting rights, restrictions and representation—Registration restrictions"):[1]

	% holding of share capital Dec 31, 2020
Shareholders registered for their own account:	
Emasan AG, Basel	3.6
UBS Fund Management (Switzerland) AG, Basel	2.3
Credit Suisse Funds AG, Zurich	2.0

	% holding of share capital Dec 31, 2020
Shareholders registered as nominees:	
Chase Nominees Ltd., London	9.6
The Bank of New York Mellon, New York	3.4
Through The Bank of New York Mellon, Everett	*1.7*
Through The Bank of New York Mellon, New York	*1.2*
Through The Bank of New York Mellon, SA/NV, Brussels	*0.5*
Nortrust Nominees Ltd., London	4.2
Shareholder acting as American Depositary Share (ADS) depositary:	
JPMorgan Chase Bank, N.A., New York	11.7

[1] Excluding 4.3% of the share capital held as treasury shares by Novartis AG or its fully owned subsidiaries

According to a disclosure notification filed with Novartis AG, Norges Bank (Central Bank of Norway), Oslo, held 2.3% of the share capital but was not registered in the Share Register as of December 31, 2020.

According to a disclosure notification filed with Novartis AG and the SIX Swiss Exchange, BlackRock, Inc., New York, held between 3% and 5%, but was registered with less than 2% of the share capital as of December 31, 2020.

Disclosure notifications pertaining to shareholdings filed with Novartis AG and the SIX Swiss Exchange are published on the latter's electronic publication platform: www.six-exchange-regulation.com/en/home/publications/significant-shareholders.html.

Duty to make an offer

According to the Swiss Federal Act on Financial Infrastructures, anyone who – directly, indirectly or acting in concert with third parties – acquires equity securities exceeding 33 1/3% of the voting rights of a company (whether or not such rights are exercisable) is required to make an offer to acquire all listed equity securities of that company. A company may raise this threshold up to 49% of the voting rights ("opting up") or may, under certain circumstances, waive the threshold ("opting out"). Novartis AG has not adopted any such measures.

Cross shareholdings

Novartis AG has no cross shareholdings in excess of 5% of capital, or voting rights with any other company.

Overview on shareholder structure

The following tables relate only to registered shareholders and cannot be assumed to represent the entire investor base because nominees and JPMorgan Chase Bank, N.A., as ADS depositary, are registered as shareholders for a large number of beneficial owners.

As of December 31, 2020, Novartis AG had approximately 176 000 registered shareholders.

Number of registered shareholders/shares

As of December 31, 2020 [1]	Number of registered shareholders	% of share capital
1–100	31 457	0.07
101–1 000	104 629	1.73
1 001–10 000	36 429	4.10
10 001–100 000	3 230	3.39
100 001–1 000 000	478	5.81
1 000 001–5 000 000	64	4.72
5 000 001 or more [2]	32	48.13
Total registered shareholders/shares	176 319	67.95
Unregistered shares		32.05
Total		**100.00**

[1] At the record date of the 2020 Annual General Meeting of Shareholders (AGM), unregistered shares amounted to 15%.
[2] Including significant registered shareholders as listed above

Registered shareholders by type

As of December 31, 2020	Shareholders in %	Shares in %
Individual shareholders	96.61	14.00
Legal entities [1]	3.34	34.51
Nominees, fiduciaries and ADS depositary	0.05	51.49
Total	**100.00**	**100.00**

[1] Excluding 4.3% of the share capital held as treasury shares by Novartis AG or its fully owned subsidiaries

Registered shareholders by country[1]

As of December 31, 2020	Shareholders in %	Shares in %
Belgium	0.12	1.03
France	2.01	0.31
Germany	5.68	1.80
Japan	0.20	0.59
Luxembourg	0.06	0.69
Switzerland [2]	87.45	44.08
United Kingdom	0.59	25.09
United States	0.28	24.36
Other countries	3.61	2.05
Total	**100.00**	**100.00**

[1] Registered shares held by nominees are shown in the country where the company/affiliate entered in the Share Register as shareholder has its registered seat.
[2] Excluding 4.3% of the share capital held as treasury shares by Novartis AG or its fully owned subsidiaries

Capital structure

Share capital

As of December 31, 2020, the share capital amounted to CHF 1 233 530 460 fully paid-in and divided into 2 467 060 920 registered shares with a nominal value of CHF 0.50 each.

Shares are listed on the SIX Swiss Exchange (ISIN CH0012005267, symbol: NOVN) and on the New York Stock Exchange (NYSE) in the form of American Depositary Receipts (ADRs) representing American Depositary Shares (ADSs) (ISIN US66987V1098, symbol: NVS).

No authorized and conditional capital exists as of December 31, 2020.

Shares, participation certificates, non-voting equity securities, profit-sharing certificates

Shares are issued as uncertificated securities (in the sense of the Swiss Code of Obligations) and as book entry securities (in terms of the Swiss Act on Intermediated Securities). All shares have equal voting rights and carry equal entitlements to dividends. No participation certificates, non-voting equity securities (Genussscheine) or profit-sharing certificates have been issued.

Convertible securities and options

Novartis AG has not issued convertible or exchangeable bonds, warrants, options or other securities granting rights to shares, other than options (or similar instruments such as stock appreciation rights) granted under or in connection with equity-based participation plans of associates. Novartis AG does not grant any new stock options under these plans.

Limitation on transferability

No transferability restrictions are imposed on shares (for registration restrictions, see "—Item 6.C Board practices—Shareholder participation—Voting rights, restrictions and representation—Registration restrictions"). The registration of shareholders in the Share Register or in the ADR register kept by JPMorgan Chase Bank, N.A., does not affect the tradability of shares or ADRs.

Changes to share capital

AGM	Shareholder decision	Shares canceled	Average repurchase share price (CHF)[1]
2018	• Capital reduction by CHF 33.11 million (from CHF 1 308 422 410 to CHF 1 275 312 410)	66 220 000	78.34
2019	• Capital reduction by CHF 11.63 million (from CHF 1 275 312 410 to CHF 1 263 687 410) • Authorization of the Board to repurchase shares up to a maximum of CHF 10 billion until the 2022 AGM under an eighth share repurchase program	23 250 000	79.08
2020	• Capital reduction by CHF 30.16 million (from CHF 1 263 687 410 to CHF 1 233 530 460)	60 313 900	88.18

AGM	Proposal to the shareholders	Shares to be canceled	Average repurchase share price (CHF)[1]
2021	• Capital reduction by CHF 16.3 million (from CHF 1 233 530 460 to CHF 1 217 210 460) • Authorization of the Board to repurchase shares as deemed appropriate from time to time up to a maximum of CHF 10 billion between the 2021 AGM and the 2024 AGM	32 640 000	80.57

[1] All shares were repurchased on the SIX Swiss Exchange second trading line.

Key Novartis share data

	2020	2019	2018
Issued shares	**2 467 060 920**	**2 527 374 820**	**2 550 624 820**
Treasury shares [1]	210 238 872	262 366 332	239 453 391
Outstanding shares at December 31	**2 256 822 048**	**2 265 008 488**	**2 311 171 429**
Weighted average number of shares outstanding	**2 277 041 940**	**2 290 792 782**	**2 319 322 369**

[1] Approximately 103 million treasury shares (2019: 118 million; 2018: 122 million) are held in Novartis entities that restrict their availability for use.

Per-share information[1]

	2020	2019	2018
Basic earnings per share from continuing operations (USD)	3.55	3.12	5.52
Basic earnings per share from discontinued operations (USD)		2.00	– 0.08
Total basic earnings per share (USD)	**3.55**	**5.12**	**5.44**
Diluted earnings per share from continuing operations (USD)	3.52	3.08	5.46
Diluted earnings per share from discontinued operations (USD)		1.98	– 0.08
Total diluted earnings per share (USD)	**3.52**	**5.06**	**5.38**
Net cash flow from operating activities of continuing operations (USD)	5.99	5.91	5.63
Year-end equity for Novartis AG shareholders (USD)	25.07	24.49	34.01
Dividend (CHF)[2]	3.00	2.95	2.85

[1] Calculated on the weighted average number of shares outstanding, except year-end equity
[2] 2020: proposal to shareholders for approval at the AGM on March 2, 2021

Key ratios – December 31

	2020	2019	2018
Price/earnings ratio[1]	26.7	18.5	15.7
Price/earnings ratio from continuing operations[1]	26.7	30.4	15.4
Dividend yield (%)[1]	3.6	3.2	3.4

[1] Based on the Novartis share price at December 31 of each year

Key data on ADRs issued in the US

	2020[1]	2019[1]	2018
Year-end ADR price (USD)	94.43	94.69	85.81
High[2]	99.01	96.14	93.91
Low[2]	70.67	75.40	72.44
Number of ADRs outstanding[3]	288 755 853	315 073 094	338 641 387

[1] 2020 and 2019 exclude the business of Alcon, which was spun off in April 2019 into a separately traded standalone company.
[2] Based on the daily closing prices
[3] The depositary, JPMorgan Chase Bank, N.A., holds one Novartis AG share for every ADR issued.

Share price (CHF)

	2020[1]	2019[1]	2018
Year-end share price	83.65	91.90	84.04
High[2]	95.82	96.04	91.84
Low[2]	69.96	77.03	72.42
Year-end market capitalization (USD billions)[3]	**214.3**	**214.8**	**197.0**
Year-end market capitalization (CHF billions)[3]	**188.8**	**208.2**	**194.2**

[1] 2020 and 2019 exclude the business of Alcon, which was spun off in April 2019 into a separately traded standalone company.
[2] Based on the daily closing prices
[3] Market capitalization is calculated based on the number of shares outstanding (excluding treasury shares). Market capitalization in USD is based on the market capitalization in CHF converted at the year-end CHF/USD exchange rate.

Shareholder participation

Shareholder engagement

Shareholder engagement is fundamental to our commitment to governance and transparency, and the feedback we receive during these engagements helps us create long-term and sustainable value.

We concentrate our outreach efforts on our largest 100 shareholders – portfolio managers; buy-side professionals; stewardship teams; and environmental, social and governance (ESG) analysts – who represent 60% of our ownership. While the Chairman, CEO and CFO together with Investor Relations are accountable for ensuring effective shareholder engagement, other senior managers from within and outside the Executive Committee also participate in the meetings. We conduct regular outreach to investors throughout the year.

TYPES OF ENGAGEMENTS (SELECT EXAMPLES):

- AGM and quarterly results teleconferences (TCs)
- Bank conferences and management roadshows
- "Meet Novartis Management" capital markets event
- Oncology pipeline update
- Governance and compensation roadshow, and governance TCs
- Chairman's lunch in Zurich, and TCs for US and UK investors
- ESG Investor Day and roadshows, including sustainability-linked bond roadshow

TOPICS DISCUSSED WITH SHAREHOLDERS DURING 2020:

INNOVATION:
- Progress and milestones
- Data of pipeline projects (e.g., ^{177}Lu-PSMA-617, ABL001, ACZ885, LNP023)
- Launches (e.g., *Kesimpta, Tabrecta*)

OPERATIONAL EXECUTION:
- Financial prudence and supply chain resilience during COVID-19
- Progress on financial, strategic and operational performance
- Long-term sustainability of financial performance
- Capital allocation strategy
- Policy and pricing environment
- Lifecycle management

DATA AND DIGITAL:
- New initiatives and progress

BUILDING TRUST WITH SOCIETY AND CULTURE (ESG):
- COVID-19 response to address all stakeholder needs
- Board accountability on ESG, and integration of ESG and compensation
- Strong governance, enhanced process and focus on material ESG factors, leading to improved rating agency scores
- New ESG targets: full carbon neutrality, patient access targets for strategic innovative therapies, and global health flagship programs
- New ESG index to improve primary ESG data
- Sustainability-linked bond demonstrating ESG innovation
- Key resolutions (settlements with US DOJ and SEC resolving all Foreign Corrupt Practices Act investigations including Greece, resolution with DOJ Antitrust Division concerning US generics industry investigation, settlement concerning speaker program litigation with Southern District of New York)
- Progress on culture and metrics

COMPENSATION AND GOVERNANCE:
- Diversity of the Board, the Executive Committee and the Company
- Board refreshment, succession planning and evaluation
- Link of compensation system to key strategic priorities
- Risk oversight
- Independence of some Board members and the external auditor
- Overboarding

We appreciate the value that shareholders attach to ESG matters. We will continue to integrate ESG into our strategy and to promote transparency through our comprehensive ESG engagement program. We have more than doubled the number of investor engagements on ESG matters in recent years, and in 2020, our CEO led our ESG Investor Day for the second time (marking our seventh dedicated ESG event for investors since 2014). We also held our second ESG roadshow in the Netherlands, and our first ESG roadshows in France, the US and Switzerland. We are the first company in the healthcare industry to issue an innovative sustainability-linked bond, and the first company to issue such a bond based on social targets.

Voting rights, restrictions and representation

REGISTRATION

Shareholders have the right to vote and to execute all other rights as granted under Swiss law and the Articles of Incorporation (see, in particular, articles 17 and 18 of the Articles of Incorporation: www.novartis.com/investors/company-overview/corporate-governance).

Each share registered with the right to vote by the third business day before the General Meeting entitles the holder to one vote at General Meetings. To be registered with voting rights, a shareholder must declare that he or she acquired the shares in his or her own name and for his or her own account. According to article 5, paragraph 3 of the Articles of Incorporation (www.novartis.com/investors/company-overview/corporate-governance), the Board may register nominees with the right to vote. The Share Register is an internal, non-public register subject to statutory confidentiality and data privacy.

REGISTRATION RESTRICTIONS

Article 5, paragraph 2 of the Articles of Incorporation (www.novartis.com/investors/company-overview/corporate-governance) provides that no shareholder shall be registered with the right to vote for more than 2% of the share capital. Given that shareholder representation at General Meetings traditionally has been rather low in Switzerland, Novartis AG considers registration restrictions necessary to prevent a minority shareholder from dominating a General Meeting. The Board may, upon request, grant an exemption. Considerations include whether the shareholder supports our goal of creating sustainable value and has a long-term investment horizon. Exemptions are in force for the registered shareholders listed in "—Item 6.C Board practices—Group structure and shareholders—Shareholders—Significant shareholders." These include Credit Suisse Funds AG, Zurich, which received an exemption in 2020 based on the fulfillment of the requirements. Exemptions also apply to the Novartis Foundation for Employee Participation, Basel, which as of December 31, 2020, was registered in the Share Register with less than 2% of the share capital, and to Norges Bank (Central Bank of Norway), Oslo, which as of December 31, 2020, was not registered but held 2.3% according to a disclosure notification filed with Novartis AG. The same restrictions indirectly apply to ADR holders.

Article 5, paragraph 3 of the Articles of Incorporation provides that no nominee shall be registered with the right to vote for more than 0.5% of the registered share capital. The Board may, upon request, grant an exemption from this restriction if the nominee discloses the names, addresses and number of shares of the persons for whose account it holds 0.5% or more of the registered share capital. Exemptions are in force for the nominees listed in "—Item 6.C Board practices—Group structure and shareholders—Shareholders—Significant shareholders," and for the nominee Citibank, London, which in 2015 requested an exemption, but as of December 31, 2020, was not registered in the Share Register. The same restrictions indirectly apply to ADR holders.

Shareholders, ADR holders, or nominees who are linked to each other or who act in concert to circumvent registration restrictions are treated as one person or nominee for the purposes of the restrictions on registration.

The registration restrictions may be changed by resolution of the General Meeting, with approval of at least two-thirds of the votes represented at the meeting.

REPRESENTATION AND SHERPANY PLATFORM

Normally, shareholders can vote their shares by themselves or appoint another shareholder or the Independent Proxy to vote on their behalf. However, in accordance with Swiss legislation passed in response to the COVID-19 pandemic, the Board has decided that voting rights at our 2021 AGM can only be exercised through the Independent Proxy. It will not be possible to physically attend our 2021 AGM. All shareholders (who are not yet registered on the online platform) will receive an invitation with a form to appoint the Independent Proxy. On this form, shareholders can also instruct the Independent Proxy to vote on alternative or additional motions related to the agenda items either (i) following the recommendations of the Board for such alternative or additional motions, or (ii) against such alternative or additional motions. They can also abstain from voting.

Shareholders can use the online Sherpany platform to receive invitations to General Meetings exclusively by email and to exercise their voting rights. Not-yet-registered shareholders can sign up with the account opening document that will be sent to them with the invitation to the 2021 AGM or by ordering the document from the Share Registry. Shareholders can deactivate their online account at any time and again receive invitations in paper form.

ADR HOLDERS

ADR holders have the rights enumerated in the deposit agreement (such as the right to give voting instructions and to receive dividends). The ADS depositary of Novartis AG – JPMorgan Chase Bank, N.A., New York – holds the shares underlying the ADRs and is registered as a shareholder in the Share Register. An ADR is not a share, and an ADR holder is not a Novartis AG shareholder. Each ADR represents one share. ADR holders exercise their voting rights by instructing the depositary to exercise their voting rights. The ADS depositary exercises the voting rights for registered shares underlying ADRs for which no voting instructions have been given by providing a discretionary proxy to an uninstructed independent designee. Such designee has to be a shareholder.

General Meeting

CONVENING

The AGM must be held within six months after the end of our financial year (December 31), and normally takes place in late February/early March. Extraordinary General Meetings may be requested by the Board, the external auditor, or shareholders representing at least 10% of the share capital.

AGENDA

Shareholders representing shares with an aggregate nominal value of at least CHF 1 million may request that an item be included in a General Meeting agenda. Such requests must be made in writing at least 45 days before the meeting, specifying the requested item and proposal.

POWERS

The following powers are vested exclusively in the General Meeting:

- Adoption and amendment of the Articles of Incorporation
- Election and removal of the Chairman, the Board and Compensation Committee members, the Independent Proxy and the external auditor
- Approval of the management report and of the consolidated financial statements
- Approval of the financial statements of Novartis AG, and decision on the appropriation of available earnings shown on the balance sheet, including dividends
- Approval of the maximum aggregate compensation of the Board (from an AGM until the next AGM) and of the Executive Committee (for the financial year following the AGM). If the maximum aggregate amount of compensation already approved by the AGM is not sufficient to cover the compensation of newly appointed or promoted Executive Committee members, Novartis may use up to 40% of the amount last approved for the newly appointed or promoted Executive Committee members.
- Discharge of Board and Executive Committee members
- Decision on other matters that are reserved by law or by the Articles of Incorporation (e.g., advisory vote on the Compensation Report) to the General Meeting

STATUTORY QUORUMS

The General Meeting passes resolutions and elections with the absolute majority of the votes represented at the meeting. However, under article 18 of the Articles of Incorporation (www.novartis.com/investors/company-overview/corporate-governance), the approval of two-thirds of the votes represented at the meeting is required for:

- Alteration of the purpose of Novartis AG
- Creation of shares with increased voting powers
- Implementation of restrictions on the transfer of registered shares, and the removal of such restrictions
- Authorized or conditional increase of the share capital
- Increase of the share capital out of equity, by contribution in kind, for the purpose of an acquisition of property or the grant of special rights
- Restriction or cancellation of subscription rights
- Change of the registered office of Novartis AG
- Dissolution of Novartis AG

In addition, the law provides for a qualified majority for other resolutions, such as a merger or demerger.

Board of Directors

Composition (as per December 31, 2020)

CHAIRMAN: J. Reinhardt
VICE CHAIRMAN: E. Vanni[1]

N. Andrews
T. Buechner
P. Bula
S. Datar
E. Doherty
A. Fudge
B. Heller
F. van Houten
S. Moroney
A. von Planta
C. Sawyers
W. Winters

AUDIT AND COMPLIANCE COMMITTEE

E. Doherty (Chair)
T. Buechner
S. Datar
A. von Planta
E. Vanni

COMPENSATION COMMITTEE

E. Vanni (Chair)
P. Bula
S. Datar
B. Heller
W. Winters

GOVERNANCE, NOMINATION AND CORPORATE RESPONSIBILITIES COMMITTEE

A. von Planta (Chair)
A. Fudge
C. Sawyers
E. Vanni
W. Winters

RISK COMMITTEE

S. Datar (Chair)
N. Andrews
T. Buechner
E. Doherty
A. von Planta

SCIENCE & TECHNOLOGY COMMITTEE

J. Reinhardt (Chair)
N. Andrews
A. Fudge
F. van Houten
S. Moroney
C. Sawyers

[1] In addition to his role as Vice Chairman, Enrico Vanni was appointed Lead Independent Director as of January 1, 2021.

Election and term of office

Board members (including the Chairman) and Compensation Committee members are elected individually by shareholders at the General Meeting for a one-year term of office. The term of office expires at the end of the next AGM.

There is currently no mandatory term limit for Board members. However, Board members who are 70 years old as of the General Meeting are no longer eligible for re-election to the Board (see article 20, paragraph 3 of the Articles of Incorporation: www.novartis.com/investors/company-overview/corporate-governance). The General Meeting may, under special circumstances, grant exceptions to this rule.

At the 2021 AGM, the Board will propose to shareholders an amendment to the Articles of Incorporation that for future re-elections would replace the current age limit with a term limit. The proposal foresees that a member shall not serve on the Board for more than 12 years. The Board may recommend to shareholders exceptions under certain circumstances and if deemed to be in the best interests of the Company.

The proposed term limit supports our commitment to renew the Board on an ongoing basis. It also follows international best practice, which increasingly asks for an overall tenure of no more than 12 years. We believe age is still a relevant factor in Board composition, and the GNCRC will consider this and other factors – including gender and ethnicity – when evaluating candidates and exploring ways to improve Board diversity.

Succession planning

The Chairman, supported by the GNCRC, ensures effective succession plans for the Board, the CEO and the Executive Committee. These plans are discussed by the Board in private meetings without management. A search for a new Board member is launched – normally with the support of a professional executive search company – with individual selection criteria defined based on the evolving needs of the Company and a continuing focus on diversity. The set of competencies (further explained in "—Item 6.C Board practices—Board of Directors—Board skills") is also an important criterion for the GNCRC when evaluating new candidates. Candidates are interviewed by the Chairman, members of the GNCRC, other Board members, and members of the Executive Committee. The GNCRC then makes a recommendation to the full Board, and the Board ultimately decides who should be proposed for election at the upcoming AGM.

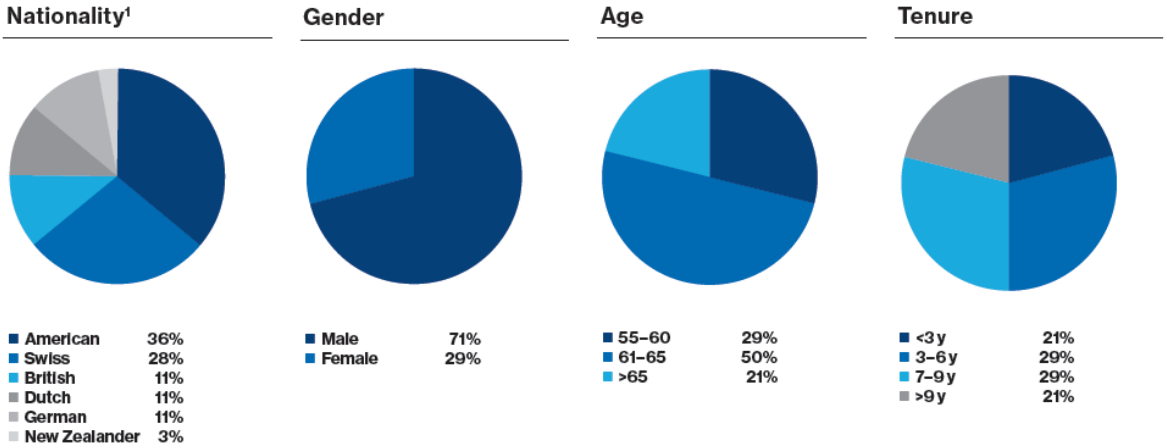
Independence

All Board members – including the Chairman – are non-executive and independent, pursuant to applicable corporate governance rules and Novartis independence criteria, which are outlined in Appendix II to the Board Regulations (www.novartis.com/investors/company-overview/corporate-governance). In particular, no Board member is or was a member of the management of Novartis AG or of any other Novartis Group company in the last three financial years up to December 31, 2020, or has a significant business relationship with Novartis AG or with any other Novartis Group company. We assess independence annually. Because all Board members are independent, no separate meetings of independent Board members were held in 2020.

Diversity

Diversity is a key factor to success and Board effectiveness. A diverse Board ensures that the appropriate balance of skills, expertise and experience is represented to discharge responsibilities to shareholders, and helps create long-term value. We are continuously looking for opportunities to improve our Board diversity, including gender and ethnic diversity. Last year, we disclosed our aspiration to find female candidates for two of the next three nominations. At the 2020 AGM, our Board welcomed its fourth female member, Bridgette Heller. Compared to last year, the female representation on our Board rose to 29% from 25%. The GNCRC is focused on achieving even greater diversity when identifying new Board member candidates and aims to further increase the number of women on the Board.

Diversity profile



[1] Please note that four Board members have two nationalities. Each of these nationalities is counted as a half in the above chart.

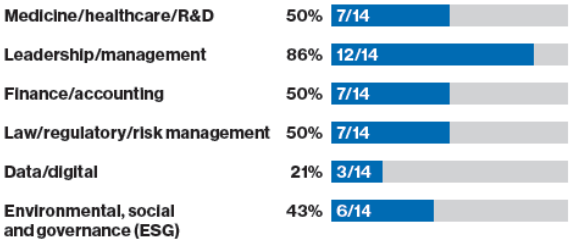
Board skills

Upon proposal by the GNCRC, the Board has determined a diverse set of competencies for its members that align with our status as a listed company as well as our business portfolio, geographic reach and culture. Based on this set of competencies, our Board members were asked to identify their most relevant skills highlighted by their educational background, professional experience and personal achievements.

The GNCRC assesses the set of competencies as well as the individual skills annually to ensure that an appropriate balance of skills, expertise, experience and diversity is represented on the Board.

To learn more about our Board members' biographies and their individual skills, see "—Item 6.C Board practices—Board of Directors—Members of the Board of Directors."

Board skill distribution



Members of the Board of Directors

Joerg Reinhardt, Ph.D.

Chairman since 2013 | Nationality: German | Year of birth: 1956

Joerg Reinhardt is a healthcare industry veteran whose career spans nearly 40 years. After receiving his doctorate in pharmaceutical sciences, Mr. Reinhardt joined Sandoz Pharma Ltd., a predecessor to Novartis, in 1982. He held a number of senior leadership positions at Novartis, including Chief Operating Officer and Head of the Vaccines and Diagnostics Division. Additionally, he led Bayer HealthCare AG as chairman of the board of management and the executive committee from 2010 to 2013.

Professional experience
- Chairman of the board of management and the executive committee, Bayer HealthCare AG, Germany (2010–2013)
- Chief Operating Officer, Novartis AG, Switzerland (2008–2010)
- Head of the Vaccines and Diagnostics Division, Novartis AG, Switzerland (2006–2008)
- Various managerial positions at Sandoz Pharma Ltd. and Novartis AG, Switzerland (1982–2006)

Mandates
- Senate member, Helmholtz Association of German Research Centres, Germany
- Chairman of the board of trustees, Institute of Molecular and Clinical Ophthalmology Basel (IOB), Switzerland
- Chairman of the board of trustees, Novartis Foundation, Switzerland
- Board member, Swiss Re AG, Switzerland
- Member of the European Advisory Panel, Temasek Holdings Private Ltd., Singapore
- Board member, Lonza Group AG, Switzerland (2012–2013)
- Chairman, Genomics Institute of the Novartis Research Foundation, US (2000–2010)

Education
- Doctorate in pharmaceutical sciences, Saarland University, Germany

Key skills
Medicine/healthcare/R&D Leadership/management Law/regulatory/risk management

Enrico Vanni, Ph.D.

Vice Chairman since 2011 | Lead Independent Director since January 1, 2021 | Nationality: Swiss | Year of birth: 1951

Enrico Vanni is an expert in business management, healthcare and technology who began his career as a research engineer at the International Business Machines Corp. (IBM) in the US. He later joined McKinsey & Co. in Switzerland, where he managed the Geneva office and led the firm's European pharmaceutical practice. Since retiring in 2007, Mr. Vanni has continued to support leaders of pharmaceutical and biotechnology companies on core strategic challenges facing the healthcare industry.

Professional experience
- Independent consultant supporting leaders of pharmaceutical and biotechnology companies (2008–2015)
- Director, consulting in pharmaceutical, consumer and financial sectors, McKinsey & Co., Switzerland (1994–2007)
- Head of the Geneva office, McKinsey & Co., Switzerland (1988–2004)

Mandates
- Board member, Advanced Oncotherapy PLC, UK
- Board member, Lombard Odier & Cie SA, Switzerland
- Board member, Banque Privée BCP (Suisse) SA, Switzerland
- Board member, Eclosion2 SA, Switzerland (2009–2017)
- Board member, Alcon Inc., Switzerland (2010–2011)
- Board member, Actavis PLC, Ireland (2010)

Education
- Master of Business Administration, INSEAD, France
- Doctorate in physical chemistry, University of Lausanne, Switzerland
- Engineering degree in chemistry, Federal Polytechnic School of Lausanne, Switzerland

Key skills
Medicine/healthcare/R&D Finance/accounting

Nancy C. Andrews, M.D., Ph.D.

Board member since 2015 | Nationality: American/Swiss | Year of birth: 1958

Nancy C. Andrews has extensive experience as a physician, scientist, professor and senior administrator at leading academic institutions and hospitals. Her distinguished career spans more than 30 years, with leadership roles at both Harvard Medical School and the Duke University School of Medicine. Dr. Andrews currently chairs the board of the American Academy of Arts and Sciences, and is credited with conducting research that led to advances in understanding iron biology and iron diseases.

Professional experience
- Dean emerita, Duke University School of Medicine, and vice chancellor emerita for academic affairs, Duke University, US (2017–present)
- Dean, Duke University School of Medicine, and vice chancellor for academic affairs, Duke University, US (2007–2017)
- Professor of pediatrics, pharmacology and cancer biology, Duke University, US (2007–present)
- Dean for basic sciences and graduate studies, Harvard Medical School, US (2003–2007)
- Director, Harvard/MIT M.D.-Ph.D. Program, US (1999–2003)
- Biomedical research investigator, Howard Hughes Medical Institute, US (1993–2006)

Mandates
- Board member, Charles River Laboratories Inc., US
- Member of the executive committee of the Corporation, Massachusetts Institute of Technology, US
- Council member, National Academy of Sciences, US
- Former council member (2013–2019) and member, National Academy of Medicine, US
- Chair of the board, American Academy of Arts and Sciences, US
- Member of the Scientific Advisory Board, Dyne Therapeutics Inc., US
- Board member and former chair, Burroughs Wellcome Fund, US (2011–2019)
- Member of the Scientific Management Review Board, National Institutes of Health, US (2014–2019)

Education
- Doctor of medicine, Harvard Medical School, US
- Doctorate in biology, Massachusetts Institute of Technology, US
- Master of Science and Bachelor of Science in molecular biophysics and biochemistry, Yale University, US

Key skills
Medicine/healthcare/R&D Leadership/management

Ton Buechner

Board member since 2016 | Nationality: Dutch/Swiss | Year of birth: 1965

Ton Buechner is an engineer by training who started his career in the oil and gas construction industry. He spent almost two decades at Sulzer AG, and held leadership roles including CEO and divisional president. Mr. Buechner most recently served as chairman and CEO of the executive board of AkzoNobel NV, a company widely recognized as a leader in sustainability, where he implemented significant ESG policies.

Professional experience
- CEO and chairman of the executive board, AkzoNobel NV, Netherlands (2012–2017)
- CEO, Sulzer AG, Switzerland (2007–2011)
- President, Sulzer Pumps, Switzerland (2003–2006)
- President, Sulzer Turbomachinery Services, Switzerland (2000–2002)
- Various managerial positions at Sulzer AG, China and Switzerland (1994–2000)

Mandates
- Chairman of the board of directors, Burckhardt Compression AG, Switzerland
- Chairman of the board of directors, Swiss Prime Site AG, Switzerland
- Advisor, Ammega, Switzerland
- Member of the presidential and shareholder committees, Voith GmbH & Co. KGaA, Germany (2014–2020)
- Member of the supervisory board, Voith GmbH & Co. KGaA, Germany (2014–2018)

Education
- Master of Business Administration, IMD business school, Switzerland
- Master of Science in civil engineering, Delft University of Technology, Netherlands

Key skills
Leadership/management Finance/accounting Law/regulatory/risk management
Environmental, social and governance (ESG)

Patrice Bula

Board member since 2019 | Nationality: Swiss | Year of birth: 1956

Patrice Bula has 40 years of global management experience and is a leader in the consumer goods industry across established and emerging markets. He has served in various senior roles at Nestlé SA, including as general manager of its businesses in China, Germany and South Africa. In his current position, he has successfully led the Nestlé Group's brand strategies, digital marketing transformation and Nespresso business.

Professional experience
- Executive vice president and head of strategic business units, marketing, sales and Nespresso, Nestlé SA, Switzerland (2011–February 2021)
- Market head of the Greater China region, Nestlé SA, Switzerland (2007–2011)
- Market head of Germany, Nestlé SA, Switzerland (2003–2007)
- Head of the confectionery and biscuits strategic business unit, Nestlé SA, Switzerland (2000–2003)
- Various managerial positions at Nestlé SA, Switzerland (1980–2000)

Mandates
- Board member, Schindler AG, Switzerland
- Co-chairman, Cereal Partners Worldwide SA, Switzerland *(Nestlé representative)*
- Chairman, Froneri Lux Topco Sarl, Luxembourg (as of January 1, 2021)
- Board member, Froneri Lux Topco Sarl, Luxembourg *(Nestlé representative)* (2016–2020)
- Board member, Bobst Group SA, Switzerland (2017–2019)
- Chairman, Blue Bottle Coffee Inc., US *(Nestlé representative)* (2017–2019)
- Chairman, Nestlé Nespresso SA, Switzerland *(Nestlé representative)* (2011–2019)
- Board member, Hsu Fu Chi Food Companies, China (*Nestlé representative*) (2011–2019)

Education
- Program for Executive Development, IMD business school, Switzerland
- Master's degree in economic sciences, HEC Lausanne, Switzerland

Key skills
Leadership/management Finance/accounting Data/digital

Srikant Datar, Ph.D.

Board member since 2003 | Nationality: American | Year of birth: 1953 |
Audit Committee Financial Expert

Srikant Datar has extensive academic experience in accounting, governance, finance, innovative thinking, machine learning and other business areas. He has served as a professor at Harvard Business School, the Stanford Graduate School of Business, and Carnegie Mellon University, and has co-authored the leading cost accounting textbook, many research papers, and cases on companies. In 2020, he was selected by the National Association of Corporate Directors as public company director of the year for his outstanding contributions in the boardroom. He was appointed dean of Harvard Business School, effective January 1, 2021.

Professional experience
- Dean, Harvard Business School, US (as of January 1, 2021)
- Professor of business administration, Harvard Business School, US (1996–present)
- Faculty chair, Harvard Innovation Labs, US (2015–2020)
- Senior associate dean for university affairs, Harvard Business School, US (2015–2020)
- Professor of accounting and management, Stanford Graduate School of Business, US (1989–1996)
- Professor of industrial administration, Carnegie Mellon University (1986–1988)

Mandates
- Board member and chair of the governance and nominating committee, ICF International Inc., US
- Board member, Stryker Corp., US
- Board member and chair of the audit committee, T-Mobile US Inc., US
- Former board member (2012–2014) and strategic advisor, HCL Technologies Ltd., India
- Board member, KPIT Cummins Infosystems Ltd., India (2007–2012)

Education
- Doctorate in business (accounting), Stanford University, US
- Master of Arts in economics, Stanford University, US
- Master of Science in statistics, Stanford University, US
- Postgraduate diploma in business management, Indian Institute of Management, India
- Bachelor of Science in mathematics and economics, Bombay University, India

Key skills
Leadership/management Finance/accounting

Elizabeth (Liz) Doherty

Board member since 2016 | Nationality: British | Year of birth: 1957 |
Audit Committee Financial Expert

Elizabeth (Liz) Doherty is an expert in finance and accounting who has broad operational experience in international consumer and retail businesses. She began her career in internal audit at Unilever PLC and has held senior finance and accounting roles there and at other companies including Tesco PLC and Reckitt Benckiser Group PLC.

Professional experience
- CFO (interim), Cognita Schools Ltd., UK (2014–2015)
- CFO and board member, Reckitt Benckiser Group PLC, UK (2011–2013)
- CFO (interim), City Inn, UK (2010)
- CFO, Brambles Ltd., Australia (2007–2009)
- Group international finance director, Tesco PLC, UK (2001–2007)
- Various managerial positions at Unilever PLC, UK (1981–2001)

Mandates
- Board member, Corbion NV, Netherlands
- Member of the supervisory board and chair of the audit committee, Royal Philips NV, Netherlands
- Advisor, Affinity Petcare SA and GB Foods SA, Spain
- Board member, Dunelm Group PLC, UK (2013–2019)
- Board member, HM Courts & Tribunals Service, UK (2015–2019)
- Board member, Ministry of Justice, UK (2015–2019)
- Board member, Delhaize Group, Belgium (2013–2016)
- Board member, Nokia Corp., Finland (2013–2016)
- Board member, Brambles Ltd., Australia (2007–2009)
- Board member, SABMiller PLC, UK (2004–2010)

Education
- Fellow, Chartered Institute of Management Accountants, UK
- Bachelor's degree in liberal studies in science (physics), University of Manchester, UK

Key skills
Leadership/management Finance/accounting Law/regulatory/risk management

Ann Fudge

Board member since 2008 | Nationality: American | Year of birth: 1951

Ann Fudge has a track record of success across global technology and consumer goods companies, and is widely considered one of the most influential women in American business. Before serving as chairman and CEO of Young & Rubicam Brands, Ms. Fudge spent 15 years in leadership roles at Kraft Foods Inc. She is deeply committed to social initiatives, including the Executive Leadership Council, a nonprofit focused on helping African American leaders positively impact business and communities. With WGBH Public Media, she has brought greater focus to more diverse media programming and broadening the reach of community-based initiatives. More recently, she has consulted with companies and educational institutions as they develop social justice initiatives.

Professional experience
- Chairman and CEO, Young & Rubicam Brands, US (2003–2007)
- President of the Beverages, Desserts and Post Division brands, Kraft Foods Inc., US (2000–2001)
- Various managerial positions at Kraft Foods Inc., US (1986–2000)

Mandates
- Senior trustee, the Brookings Institution, US
- Member, American Academy of Arts and Sciences, US
- Board member, Northrop Grumman Corp., US
- Chair of the board of trustees, WGBH Public Media, US
- Chair of the United States Program Advisory Panel, Bill & Melinda Gates Foundation, US (2007–2019)
- Member of the visiting committee, Harvard Business School, US (2014–2019)
- Board member and former vice chair, Unilever PLC and NV, UK and Netherlands (2009–2018)
- Board member, General Electric Co., US (1999–2015)

Education
- Master of Business Administration, Harvard Business School, US
- Bachelor's degree in management, Simmons College, US

Key skills
Leadership/management Environmental, social and governance (ESG)

Bridgette Heller

Board member since February 28, 2020 | Nationality: American | Year of birth: 1961

Bridgette Heller has proven experience in the standalone divisions of companies such as Johnson & Johnson, Merck & Co. Inc. and Danone SA, and has served on the audit committees of ADT Corp. and Tech Data Corp. During her career, she has overseen the performance of CFOs and made decisions on strategic R&D priorities. Ms. Heller is an advocate for diversity, equity and inclusion, and traveled globally to reinforce Danone's commitment to infant and maternal health, inclusive diversity, an equitable workforce for women, and sustainable communities. She is co-founder and CEO of the Shirley Proctor Puller Foundation, an education and youth empowerment nonprofit, and devotes much of her time to strengthening education and sustainability in an underserved community in the US.

Professional experience
- Co-founder and CEO, Shirley Proctor Puller Foundation, US (2019–present)
- EVP and president of specialized nutrition, Danone SA, Netherlands (2017–2019)
- EVP of early life nutrition, Danone SA, Netherlands (2016–2019)
- EVP and president of consumer care, Merck & Co. Inc., US (2010–2015)
- Global president of the baby global business unit, Johnson & Johnson, US (2007–2009)
- President of the US baby, kids and wound care business and of global innovation development, Johnson & Johnson, US (2005–2007)
- Managing partner, Heller Associates: Ideas for Growth Inc., US (2004–2005)
- CEO, Chung's Gourmet Foods, US (2003–2004)
- Various managerial positions at Kraft Foods Inc., US (1985–2003)

Mandates
- Board member, Dexcom Inc., US
- Board member, Newman's Own Inc., US
- Member of the board of trustees, Northwestern University, US
- Member of the advisory board, Kellogg School of Management at Northwestern University, US
- Board member, Shirley Proctor Puller Foundation, US
- Board member, Tech Data Corp., US (2016–2020)
- Board member, ADT Corp., US (2012–2016)
- Board member, Girls Inc., US (2002–2014)

Education
- Master's degree in marketing and management policy, Kellogg School of Management at Northwestern University, US
- Bachelor's degree in economics and computer studies, Northwestern University, US

Key skills
Medicine/healthcare/R&D Leadership/management Finance/accounting
Environmental, social and governance (ESG)

Frans van Houten

Board member since 2017 | Nationality: Dutch | Year of birth: 1960

Frans van Houten is passionate about purpose-driven innovation, entrepreneurship and business transformation to drive competitiveness and customer value. Under his leadership as CEO, Royal Philips NV has transformed into a focused health technology leader through targeted divestments, acquisitions and organic business development. Royal Philips NV has also adopted a comprehensive set of commitments across all the ESG dimensions, and is today carbon neutral in its operations and recycles 90% of its operational waste. Mr. van Houten was an initiator of The Compact for Responsive and Responsible Leadership, which aims to create a corporate governance framework with a focus on the long-term sustainability of corporations and the long-term goals of society.

Professional experience
- CEO and chairman of the executive committee and the board of management, Royal Philips NV, Netherlands (2011–present)
- Interim management, ING Group NV, Netherlands (2009–2010)
- CEO and chairman of the management board, NXP Semiconductors NV (formerly Philips Semiconductors NV), Netherlands (2004–2009)
- Various managerial positions at Royal Philips Electronics NV, Netherlands (1986–2004)

Mandates
- Member of the steering committee, European Round Table for Industry (ERT), Belgium
- Vice chairman and member of the supervisory board, Philips Lighting, Netherlands (2016–2017)

Education
- Master of Science in economics and business management, Erasmus University Rotterdam, Netherlands
- Bachelor of Science in economics, Erasmus University Rotterdam, Netherlands

Key skills
Medicine/healthcare/R&D Leadership/management Law/regulatory/risk management
Data/digital Environmental, social and governance (ESG)

Simon Moroney, D.Phil.

Board member since February 28, 2020 | Nationality: German/New Zealander | Year of birth: 1959

As co-founder and CEO of MorphoSys AG, Simon Moroney played a central role in establishing the company as a force in the field of therapeutic antibodies, with one of the broadest pipelines of drug candidates in the industry. Mr. Moroney holds both a doctorate and a Master of Science in chemistry.

Professional experience
- Co-founder and CEO, MorphoSys AG, Germany (1992–2019)
- Research associate, Department of Pharmacology, University of Cambridge, UK (1991–1992)
- Assistant professor, Department of Chemistry, University of British Columbia, Canada (1989–1990)

Education
- Doctorate in chemistry, University of Oxford, UK
- Master of Science in chemistry, University of Waikato, New Zealand

Key skills
Medicine/healthcare/R&D Leadership/management Law/regulatory/risk management

Andreas von Planta, Ph.D.

Board member since 2006 | Nationality: Swiss | Year of birth: 1955

Andreas von Planta is a leading expert in corporate governance, corporate law and stock exchange regulation. He advises boards of public companies on corporate governance matters and is a sought-after speaker and writer on these topics. He has co-authored the Switzerland chapter of the International Comparative Legal Guide to Corporate Governance for many years.

Professional experience
- Senior counsel, Lenz & Staehelin, Switzerland (2017–present)
- Partner, Lenz & Staehelin, Switzerland (1988–2017)

Mandates
- Board member, Helvetia Holding AG, Switzerland
- Board member, A.P. Moller Finance SA, Switzerland
- Board member, Helvetia Schweizerische Lebensversicherungsgesellschaft AG, Switzerland
- Board member, Helvetia Schweizerische Versicherungsgesellschaft AG, Switzerland
- Chairman, HSBC Private Bank (Suisse) SA, Switzerland
- Chairman, HSBC Private Banking Holdings (Suisse) SA, Switzerland
- Board member, Socotab Frana SA, Switzerland
- Chairman of the regulatory board, SIX Swiss Exchange AG, Switzerland
- Board member, Burberry (Suisse) SA, Switzerland
- Chairman of the audit committee, International Road Transport Union, Switzerland
- Board member, Raymond Weil SA, Switzerland (2007–2018)
- Board member and former chairman, Clinique Générale-Beaulieu SA, Switzerland (2008–2016)
- Board member and former chairman, Schweizerische National Versicherungs AG, Switzerland (1997–2015)
- Board member, Holcim AG, Switzerland (2003–2014)

Education
- Master of Laws, Columbia Law School, US
- Bar examination, Switzerland
- Doctorate in law, University of Basel, Switzerland
- Licentiatus iuris, University of Basel, Switzerland

Key skills
Law/regulatory/risk management Environmental, social and governance (ESG)

Charles L. Sawyers, M.D.

Board member since 2013 | Nationality: American | Year of birth: 1959

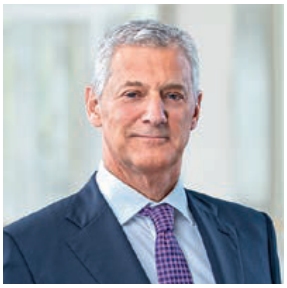
Charles L. Sawyers is a highly accomplished expert and leader in cancer research. As a physician and prominent scientist, he has a deep understanding of the benefits of drugs for patients and society at large, and the importance of access to medicines. Dr. Sawyers co-developed the Novartis cancer drug *Gleevec/Glivec* and has received numerous honors and awards, including the Lasker-DeBakey Clinical Medical Research Award.

Professional experience
- Chair of the Human Oncology and Pathogenesis Program, Memorial Sloan Kettering Cancer Center, US (2006–present)
- Professor of medicine (2008–present), and professor of cell and developmental biology (2011–present), Weill Cornell Graduate School of Medical Sciences, US
- Investigator, Howard Hughes Medical Institute, US (2002–2006 and 2008–present)
- Associate chief, Division of Hematology-Oncology, University of California, Los Angeles, US (1996–2006)

Mandates
- Member, National Academy of Medicine, US
- Member, National Academy of Sciences, US
- Investigator, Howard Hughes Medical Institute, US
- Science advisor for the following US companies: Agios Pharmaceuticals Inc.; Arsenal Capital Partners; BeiGene Ltd.; Blueprint Medicines Corp.; Foghorn Therapeutics Inc.; Housey Pharmaceutical Research Laboratories; KSQ Therapeutics Inc.; Nextech Invest Ltd.; ORIC Pharmaceuticals Inc.; PMV Pharmaceuticals Inc.; The Column Group
- Member, National Cancer Advisory Board, US (2012–2020)
- President, American Association for Cancer Research, US (2013–2014)

Education
- Doctor of medicine, Johns Hopkins University School of Medicine, US
- Bachelor of Arts, Princeton University, US

Key skills
Medicine/healthcare/R&D Leadership/management Environmental, social and governance (ESG)



William T. Winters

Board member since 2013 | Nationality: British/American | Year of birth: 1961

William T. Winters has extensive leadership experience in the financial sector. He began his career at JPMorgan Chase & Co. in 1983 and has held management roles across several market areas and in corporate finance. Mr. Winters founded Renshaw Bay LLP, an alternative asset management firm, and now serves as CEO of Standard Chartered PLC, where he is leading a digital transformation of the global bank.

Professional experience
- CEO, Standard Chartered PLC, UK (2015–present)
- Chairman and CEO, Renshaw Bay LLP, UK (2011–2015)
- Co-CEO of the Investment Bank, JPMorgan Chase & Co., UK (2004–2010)
- Various managerial positions at JPMorgan Chase & Co., UK and US (1983–2004)

Mandates
- Board member, Standard Chartered Bank PLC, UK
- Board member, International Rescue Committee, UK
- Chair of the board of trustees, The Coronet Theatre, UK
- Commissioner, Independent Commission on Banking, UK (2010–2011)

Education
- Master of Business Administration, Wharton School of the University of Pennsylvania, US
- Bachelor's degree in international relations, Colgate University, US

Key skills
Leadership/management Finance/accounting Law/regulatory/risk management Data/digital

Corporate Secretary

Charlotte Pamer-Wieser, Ph.D.

Self-assessment

The Board and its committees conduct a self-assessment once a year, covering topics including Board composition, purpose, scope and responsibilities; Board processes and governance; Board meetings and pre-reading material; team effectiveness; and Chairman and peer evaluation. Every third year, this process is conducted by an independent external consultant. This last happened in 2017 and was repeated in 2020 with the consulting firm Egon Zehnder.

As part of the 2020 self-assessment, each Board member filled out a questionnaire prepared by Egon Zehnder, and then participated in an interview to share his or her perspectives on current strengths and potential areas for development, best practices exhibited by other boards, the contributions of each Board member, and the interaction between the Board and the Executive Committee. Additionally, representatives from Egon Zehnder met with each Executive Committee member to capture his or her perspectives on how the Board functions as a whole and interacts with the Executive Committee, and to solicit ideas on how the Board can be even more effective. Egon Zehnder representatives also observed parts of a Board meeting.

In a meeting with the Chairman, Egon Zehnder first shared the preliminary results of the in-depth assessment. Thereafter, Egon Zehnder led a qualitative review with the Board, sharing its key observations and recommendations, and held individual feedback sessions with each Board member.

The results of the 2020 in-depth assessment by Egon Zehnder determined that the Board and its committees are perceived as functioning well, and that the Board is evolving positively, both in how it operates and in its composition. Board meetings are considered to have a high level of transparency, and provide clarity around decisions. The feedback from management on the Board's evaluation showed that the Executive Committee welcomes the longer-term perspective of the Board and the level of strategic discussion, as well as the interactions with individual Board members.

The report did make a number of recommendations for the Board's consideration, including succession planning (the right degree of continuity, diversity, and breadth of skills), and where the Board should focus its attention, factoring in the current challenges posed by the pandemic.

Trainings

Our Board receives regular briefings and trainings on ethics, risks and compliance, and other relevant topics. In 2020, each Board member completed the following e-learning courses:

- Data Privacy
- Novartis Code of Ethics
- Fit to Commit, focusing on our ethical commitments around anti-bribery, antitrust and fair competition, insider trading and third-party risk management

Our Chief Legal Officer also provides regular updates to our Board members on developments related to insider trading laws and regulations. In addition, the Company offers to its Board members a broad set of external trainings.

Role of the Board and its committees

The Board is responsible for the overall direction and oversight of management, and holds the ultimate decision-making authority, with the exception of decisions reserved for shareholders.

The Board has delegated certain of its duties and responsibilities to its five committees led by a Board-elected committee chair, as set out in the Board Regulations (www.novartis.com/investors/company-overview/corporate-governance). In some cases, these responsibilities are of an advisory or preparatory nature (A/P). In other cases, the committee has decision-making power that is subject to final Board approval (FBA), or the responsibilities have been fully delegated to the committee (FD). All committees have the authority to retain external consultants.

Any Board member may request a Board or committee meeting and the inclusion of an agenda item. Before meetings, Board members receive materials to help them prepare the discussions and decision-making.

Board of Directors

Primary responsibilities

- Strategy: decides on the ultimate direction of the Group's business (including portfolio, markets, acquisitions and divestments)
- Structure and organization: determines major changes in the Group's structure and organization
- Culture: oversees the strategy and implementation of the corporate culture
- Ethics and compliance: oversees the Group's ethics and compliance framework, including the approval of fundamental corporate policies such as the Novartis Code of Ethics
- Risk management: oversees the Group's risk management system, the most significant risks and how these risks are managed
- Finance: determines the Group's accounting system, financial controls and financial planning; reviews and approves the Annual Report (including the Compensation Report)
- People and organization: nominates or appoints, removes, and determines responsibilities of key executives, and succession planning

Key activities in 2020

Strategic priorities[5]

- Oversaw the overall Company strategy focused on the five strategic pillars
- Oversaw the COVID-19 response plan at Novartis and closely monitored, together with the Executive Committee, the implementation of innovative solutions (e.g., the Choice with Responsibility working model)
- Reviewed the Company's ESG strategy and efforts, also as reflected in external ESG rankings
- Reviewed and discussed the culture transformation and efforts to strengthen Novartis leadership, focusing on sustainability and talent management with "big bet" solutions (e.g., unbossed leadership experience)
- Followed up on the NTO and NBS transformation programs powered by data, digital and technology
- Discussed longer-term Board succession planning and required profiles, and approved the creation of a Lead Independent Director role[1]
- Agreed to propose a term limit for Board members at the 2021 AGM[2]
- Focused on accelerating our drive to scale up data and digital through innovation, engagement and operation, and on ensuring high-quality data and clear data governance
- Discussed and reviewed the annual Board self-evaluation conducted by an external consultant

Meetings

Number of meetings held	10
Number of members	14
Approximate average duration (hours)	4:46
Meeting attendance	99%

The Board met 10 times in 2020. This includes regular meetings in January, April, June, August, October and December, and additional special meetings to deal with ad hoc matters. Board committees typically meet the day before the meetings of the full Board. In response to the COVID-19 pandemic, the Board seamlessly moved to virtual meetings as of April 2020.

J. Reinhardt (Chair)	10
E. Vanni (Vice Chairman, Lead Independent Director[3])	10
N. Andrews	10
T. Buechner	10
P. Bula	10
S. Datar	10
E. Doherty	10
A. Fudge	10
B. Heller[4]	8
F. van Houten	9
S. Moroney[4]	8
A. von Planta	10
C. Sawyers	10
W. Winters	9

Documents

- Articles of Incorporation of Novartis AG
- Board Regulations

www.novartis.com/investors/company-overview/corporate-governance

[1] See "—Item 6.C Board practices—Board of Directors—Vice Chairman and Lead Independent Director"
[2] See "—Item 6.C Board practices—Board of Directors—Election and term of office"
[3] As of January 1, 2021
[4] Ms. Heller and Mr. Moroney were elected at the 2020 AGM and have attended all Board meetings since their election.
[5] Strategic priorities:

Unleash the power of our people | Deliver transformative innovation | Embrace operational excellence | Go big on data and digital | Build trust with society

Audit and Compliance Committee

Primary responsibilities

- Supervises the external auditor, and selects and nominates the external auditor for election by the shareholders (FD)**
- Oversees Internal Audit (FD)**
- Oversees accounting policies, financial controls, and compliance with accounting and internal control standards (FD)**
- Approves financial statements for the first three quarters of each calendar year and the corresponding financial results releases (FD)**, and reviews the annual financial statements and the corresponding financial results releases (FBA)***
- Oversees internal control and compliance processes and procedures (FD)**
- Oversees compliance with laws, regulations and internal policies falling into its subject matter expertise (FD)**

Key activities in 2020 / Strategic priorities[2]

- Tendered the external audit mandate for the selection of an audit firm to be proposed to shareholders for election at the 2022 AGM[1]
- Evaluated the performance and nomination of the external auditor PricewaterhouseCoopers AG (PwC) for re-election at the 2021 AGM
- Reviewed the accounting and financial reporting, focusing in particular on those areas involving significant risk or judgment
- Reviewed progress on the transformation of Group Financial Reporting & Accounting (FRA), and assessed its operational stability
- Received the risk assessment of high-risk countries and associated plans to mitigate the risks
- Received reports and updates from Internal Audit; Quality; Ethics, Risk & Compliance (ERC); the SpeakUp Office; Health, Safety and Environment (HSE); Tax; and Legal, and discussed progress on identifying and remedying the root causes of issues

Meetings

Number of meetings held	8
Number of members	5
Approximate average duration (hours)	2:43
Meeting attendance	100%

E. Doherty (Chair, Audit Committee Financial Expert)	8
T. Buechner	8
S. Datar (Audit Committee Financial Expert)	8
A. von Planta	8
E. Vanni	8

Documents

- Board Committees Charter, Appendix I to the Board Regulations

www.novartis.com/investors/company-overview/corporate-governance

* A/P = advisory or preparatory task
** FD = fully delegated task
*** FBA = task subject to final Board approval
[1] See "—Item 6.C Board practices—Auditors—Auditor tender process"
[2] Strategic priorities:

Unleash the power of our people | Deliver transformative innovation | Embrace operational excellence | Go big on data and digital | Build trust with society

Compensation Committee

Primary responsibilities

- Designs, reviews and recommends to the Board the compensation policies and programs (FBA)***
- Advises the Board on the compensation of Board members and of the CEO (A/P)*
- Decides on the compensation of Executive Committee members (FD)**
- Prepares the Compensation Report and the Say-on-Pay brochure, and submits them to the Board for approval (FBA)***

Key activities in 2020

- Made decisions relating to Executive Committee compensation during the year
- Determined the critical performance measures (including financial, strategic, operational, innovation and ESG) to be considered in the 2020 incentive plan targets
- Reviewed the achievement of incentive plan targets for the Executive Committee members
- Reviewed shareholder and proxy advisor feedback related to Novartis compensation practices and disclosures
- Considered additional disclosures in the 2020 Compensation Report
- Proposed appropriate peer companies for comparisons of board and executive committee compensation, and assessed the Company's level of compensation against the peer group

Strategic priorities[3]

Meetings

Number of meetings held	6
Number of members	5
Approximate average duration (hours)	2:11
Meeting attendance	100%

E. Vanni (Chair)[1]	6
P. Bula	6
S. Datar	6
B. Heller[2]	5
W. Winters	6

Documents

- Board Committees Charter, Appendix I to the Board Regulations

www.novartis.com/investors/company-overview/corporate-governance

* A/P = advisory or preparatory task
** FD = fully delegated task
*** FBA = task subject to final Board approval
[1] At the 2021 AGM, Mr. Vanni will stand for re-election as member of the Compensation Committee, but will step down as committee chair. The Board proposes to shareholders the election of Mr. Moroney as new member of the Compensation Committee. Subject to his election, the Board intends to designate Mr. Moroney as successor of Mr. Vanni in the role of the chair. Mr. Moroney attended each Compensation Committee meeting after the 2020 AGM as a permanent guest.
[2] Ms. Heller was elected at the 2020 AGM and has attended all Compensation Committee meetings since her election.
[3] Strategic priorities:

Unleash the power of our people **Deliver transformative innovation** **Embrace operational excellence** **Go big on data and digital** **Build trust with society**

Governance, Nomination and Corporate Responsibilities Committee

Primary responsibilities

- Oversees the Company's strategy, governance and progress on ESG, global health and corporate responsibility (FBA)***
- Recommends to the Board corporate governance best practices (FBA)***
- Reviews periodically the Articles of Incorporation and Board Regulations, with a view to fostering shareholder rights (FD)**
- Reviews regularly the composition and size of the Board and its committees (FBA)***
- Identifies new Board member candidates and recommends to the Board whether existing Board members should stand for re-election (FBA)***
- Prepares and reviews succession plans for the Chairman, the Vice Chairman, the Lead Independent Director, Board members, committee members and chairs, and the CEO (FBA)***
- Reviews annually the independence of each Board member (FBA)***
- Reviews directorships and agreements of Board members for conflicts of interest, and deals with conflicts of interest (FBA)***

Key activities in 2020 / Strategic priorities[3]

- Evaluated sustainability at Novartis, focusing on material ESG factors, strategy and corresponding short- and mid-term ESG targets, and ways to leverage Novartis ESG efforts
- Assessed ESG rating agency scores and identified potential gaps
- Reviewed access-to-medicine and global health targets announced in September, as well as the issuance of an innovative sustainability-linked bond
- Discussed the progress of the Global Health & Corporate Responsibility function, including the COVID-19 response such as the creation of donation funds worth up to USD 40 million to support communities impacted by the pandemic
- Received an update on the patient advocacy key achievements in 2020 and discussed the priorities for 2021
- Discussed the succession of Board and committee members (including committee chairs), taking into account upcoming retirements and the desire to increase diversity
- Discussed and recommended to the Board the creation of a Lead Independent Director role[1] and the introduction of a term limit for Board members[2]
- Reviewed the skill matrix and independence of the Board
- Discussed the format of the 2021 AGM

Meetings

Number of meetings held	4
Number of members	5
Approximate average duration (hours)	1:53
Meeting attendance	100%

A. von Planta (Chair)	4
A. Fudge	4
C. Sawyers	4
E. Vanni	4
W. Winters	4

Documents

- Board Committees Charter, Appendix I to the Board Regulations

www.novartis.com/investors/company-overview/corporate-governance

* A/P = advisory or preparatory task
** FD = fully delegated task
*** FBA = task subject to final Board approval
[1] See "—Item 6.C Board practices—Board of Directors—Vice Chairman and Lead Independent Director"
[2] See "—Item 6.C Board practices—Board of Directors—Election and term of office"
[3] Strategic priorities:

Unleash the power of our people | Deliver transformative innovation | Embrace operational excellence | Go big on data and digital | Build trust with society

Risk Committee

Primary responsibilities

- Oversees the risk management system and processes (FBA)***
- Reviews, together with management, the prioritization and handling of risks, the risk portfolio, and actions implemented by management (FBA)***
- Performs deep dives into key risk areas and fosters a culture of smart risk-taking (FBA)***

Key activities in 2020

- Reviewed and discussed the Company's Third-Party Risk Management program
- Analyzed the Company's launch excellence, including risks and challenges
- Discussed the culture transformation and how to engage Novartis leaders in the process
- Received two updates on cybersecurity from the Chief Information Security Officer
- Evaluated various risks and their coverage (e.g., developments in EU data privacy)
- Analyzed pricing developments
- Reviewed the NTO transformation and the risk management framework
- Reviewed the Enterprise Risk Management (ERM) results

Strategic priorities[1]

Meetings

Number of meetings held	4
Number of members	5
Approximate average duration (hours)	2:10
Meeting attendance	100%

S. Datar (Chair)	4
N. Andrews	4
T. Buechner	4
E. Doherty	4
A. von Planta	4

Documents

- Board Committees Charter, Appendix I to the Board Regulations

www.novartis.com/investors/company-overview/corporate-governance

* A/P = advisory or preparatory task
** FD = fully delegated task
*** FBA = task subject to final Board approval
[1] Strategic priorities:

Unleash the power of our people **Deliver transformative innovation** **Embrace operational excellence** **Go big on data and digital** **Build trust with society**

Science & Technology Committee

Primary responsibilities

- Monitors emerging scientific, data-related, technological and research trends and issues, and brings recommendations to the Board (FBA)***
- Periodically informs the Board about critical developments for the success of the portfolio and for scientific, technological and research activities as well as benchmarking (A/P)*
- Assists the Board with setting the Company's strategy for science, data, technology and research (A/P)*
- Assists the Board with oversight and evaluation of the performance of the Company's scientific, technological, and research and development activities (FBA)***
- Reviews performance and proposed targets in the area of science, technology and research (FD)**
- Reviews such other matters in relation to science, data, technology and research as the committee may, in its own discretion, deem desirable in connection with its responsibilities (A/P)*

Key activities in 2020

- Expanded its scope to digital technology and implemented name change from Research & Development Committee to Science & Technology Committee
- Reviewed the Company's digitization process and discussed the further development of the digital investment
- Reviewed an external assessment of the portfolio and productivity of Novartis research and development
- Discussed the cardiovascular, renal and metabolism; ophthalmology; and hematology portfolios

Strategic priorities[2]

Meetings

Number of meetings held	3
Number of members	6
Approximate average duration (hours)	7:10
Meeting attendance	100%

J. Reinhardt (Chair)	3
N. Andrews	3
A. Fudge	3
F. van Houten	3
S. Moroney[1]	3
C. Sawyers	3

Documents

- Board Committees Charter, Appendix I to the Board Regulations

www.novartis.com/investors/company-overview/corporate-governance

* A/P = advisory or preparatory task
** FD = fully delegated task
*** FBA = task subject to final Board approval
[1] Mr. Moroney was elected at the 2020 AGM and has attended all Science & Technology Committee meetings since his election.
[2] Strategic priorities:

Unleash the power of our people | **Deliver transformative innovation** | **Embrace operational excellence** | **Go big on data and digital** | **Build trust with society**

Chairman

The Chairman leads the Board to represent the interests of all stakeholders, and ensures an appropriate balance of power between the Board and the Executive Committee. In this role, he:

- Provides leadership to the Board
- Supports and mentors the CEO
- Ensures that the Board and its committees work effectively
- Sets the agenda, style and tone of Board discussions, promoting constructive dialogue and effective decision-making
- Ensures onboarding programs for new Board members, and continuing education and specialization for all Board members
- Ensures the Board's annual performance evaluation
- Promotes effective relationships and communication between Board and Executive Committee members
- Ensures effective communication with the Company's shareholders, other stakeholders and the public

Vice Chairman and Lead Independent Director

Until December 31, 2020, the Vice Chairman had the following responsibilities:

- Leads the Board in case and as long as the Chairman is incapacitated
- Chairs the sessions of the independent Board members, and leads the independent Board members if and as long as the Chairman is not independent
- Leads the yearly session of the Board members to evaluate the performance of the Chairman, during which the Chairman is not present

To support adequate control mechanisms, the Board amended, with effect as of January 1, 2021, the Board Regulations (www.novartis.com/investors/company-overview/corporate-governance) to introduce the additional role of the Lead Independent Director with the following duties:

- Chairs the sessions of the independent Board members
- Leads the independent Board members in case of a crisis or matter requiring their separate consideration or decision

The Vice Chairman will continue to lead the Board in case and as long as the Chairman is incapacitated. In addition, the Vice Chairman leads the Board's annual assessment of the Chairman.

The roles of the Vice Chairman and the Lead Independent Director can be held by two Board members or by one Board member (combined role).

The Board appointed Enrico Vanni as Vice Chairman and Lead Independent Director (combined role) effective as of January 1, 2021. With his long-standing experience, Mr. Vanni will help shape the role of the Lead Independent Director during his remaining time on the Board.

Honorary Chairmen

Alex Krauer and Daniel Vasella have been appointed Honorary Chairmen in recognition of their significant achievements on behalf of Novartis. They are not provided with Board documents and do not attend Board meetings.

Mandates outside the Novartis Group

According to article 34, paragraph 1 of the Articles of Incorporation (www.novartis.com/investors/company-overview/corporate-governance), the following limitations on mandates apply:

	Maximum number of mandates
Mandates	10
Other listed companies [1]	4

[1] Chairmanship of the board of directors in other listed companies counts as two mandates.

According to article 34, paragraph 3 of the Articles of Incorporation (www.novartis.com/investors/company-overview/corporate-governance), the following mandates are not subject to the above-mentioned limitations:

	Maximum number of mandates
Mandates in companies that are controlled by Novartis AG	No limit
Mandates held at the request of Novartis AG or companies controlled by it	5
Mandates in associations, charitable organizations, foundations, trusts and employee welfare foundations	10

"Mandates" means those in the supreme governing body of a legal entity that is required to be registered in the commercial register or a comparable foreign register. Mandates in different legal entities that are under joint control are deemed one mandate.

Executive Committee

Composition (as per December 31, 2020)

Vasant (Vas) Narasimhan
Chief Executive Officer

Steven Baert
Chief People & Organization Officer

Bertrand Bodson[1]
Chief Digital Officer

James (Jay) Bradner
President of the Novartis Institutes for BioMedical Research (NIBR)

Harry Kirsch
Chief Financial Officer

Shannon Thyme Klinger
Chief Legal Officer

Steffen Lang
Global Head of Novartis Technical Operations (NTO)

Klaus Moosmayer
Chief Ethics, Risk & Compliance Officer

Richard Saynor
Chief Executive Officer of Sandoz

Susanne Schaffert
President of Novartis Oncology

John Tsai
Head of Global Drug Development and Chief Medical Officer

Marie-France Tschudin
President of Novartis Pharmaceuticals

Robert Weltevreden[1]
Head of Novartis Business Services (NBS)

[1] Effective February 1, 2021, the Digital function will be merged with NBS to form a new Customer & Technology Solutions (CTS) unit, which Mr. Weltevreden has been appointed to lead. Mr. Bodson will step down from the Executive Committee on February 1, 2021.

Role of the Executive Committee

The Board has appointed the Executive Committee members and delegated to them the overall responsibility for and oversight of the operational management of Novartis, including:

- Recruiting, appointing and promoting senior management
- Ensuring the efficient operation of the Group and the achievement of optimal results
- Promoting an active internal and external communications policy
- Developing policies and strategic plans for Board approval, and implementing those approved
- Submitting the following to the Board for approval: investments, divestments, transactions, contracts and litigations with a value exceeding USD 500 million, capital market and other important financing transactions, as well as all other matters of fundamental significance to the Novartis Group
- Preparing and submitting quarterly and annual reports to the Board and its committees
- Informing the Board of all matters of fundamental significance to the businesses
- Dealing with any other matters delegated by the Board

There are no contracts between Novartis and third parties whereby Novartis would delegate any business management tasks to such third parties.

CEO

With the support of the Executive Committee, the CEO is responsible for the operational management of Novartis. This includes effectively implementing the Company strategy, delivering financial results, and shaping a corporate culture of empowerment and responsibility to help drive innovation, performance and reputation.

In addition to other Board-assigned duties, the CEO leads the Executive Committee, building and maintaining an effective executive team. With the support of the Executive Committee, the CEO is responsible for:

- Ensuring Novartis has the capabilities to achieve its long-term strategic objectives
- Developing robust management succession and development plans for presentation to the Board
- Promoting effective communication with shareholders and other stakeholders
- Ensuring Novartis conducts its business in a legal and ethical manner
- Developing an effective risk control framework for all business activities
- Ensuring the flow of information to the Board is accurate, timely and clear

Diversity

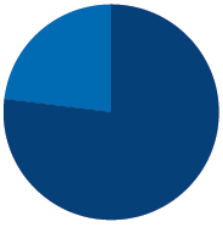
The composition as of December 31, 2020, in terms of nationality, gender, age and length of tenure, is shown in the following charts:

Diversity profile

Nationality[1]

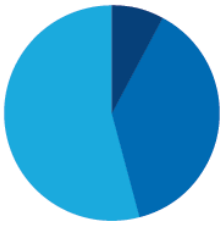
- American 31%
- German 23%
- Swiss 15%
- Belgian 15%
- Dutch 8%
- British 8%

Gender



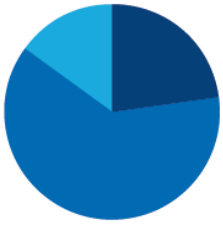
- Male 77%
- Female 23%

Age



- <45 8%
- 45–50 38%
- >50 54%

Tenure



- <2 y 23%
- 2–4 y 62%
- >4 y 15%

[1] Please note that two Executive Committee members have two nationalities. Each of these nationalities is counted as a half in the above chart.

Mandates outside the Novartis Group

According to article 34, paragraph 2 of the Articles of Incorporation (www.novartis.com/investors/company-overview/corporate-governance), the following limitations on mandates apply:

	Maximum number of mandates
Mandates	6
Other listed companies[1]	2

[1] Chairmanship of the board of directors in other listed companies is not allowed.

According to article 34, paragraph 3 of the Articles of Incorporation (www.novartis.com/investors/company-overview/corporate-governance), the following mandates are not subject to above-mentioned limitations:

	Maximum number of mandates
Mandates in companies that are controlled by Novartis AG	No limit
Mandates held at the request of Novartis AG or companies controlled by it	5
Mandates in associations, charitable organizations, foundations, trusts and employee welfare foundations	10

"Mandates" means those in the supreme governing body of a legal entity that is required to be registered in the commercial register or a comparable foreign register. Mandates in different legal entities that are under joint control are deemed one mandate.

Members of the Executive Committee

Vasant (Vas) Narasimhan, M.D.

Chief Executive Officer of Novartis since 2018 | Nationality: American | Year of birth: 1976

Professional experience
- Global Head of Drug Development and Chief Medical Officer, Novartis AG, Switzerland (2016–2018)
- Global Head of Development, Novartis Pharmaceuticals, Switzerland (2014–2016)
- Global Head of Biopharmaceuticals and Oncology Injectables, Sandoz International, Germany (2014)
- Global Head of Development, Novartis Vaccines, US (2012–2014)
- North America Region Head, Novartis Vaccines, and US Country President, Novartis Vaccines and Diagnostics, US (2008–2012)
- Joined Novartis in 2005

Mandates
- Member, National Academy of Medicine, US
- Board member, African Parks Network, South Africa
- Committee member, Biopharmaceutical CEOs Roundtable (BCR), International Federation of Pharmaceutical Manufacturers & Associations (IFPMA), Switzerland
- Member of the board of fellows, Harvard Medical School, US
- Board member, Pharmaceutical Research and Manufacturers of America (PhRMA), US

Education
- Doctor of medicine, Harvard Medical School, US
- Master's degree in public policy, John F. Kennedy School of Government, Harvard University, US
- Bachelor's degree in biological sciences, University of Chicago, US

Steven Baert

Chief People & Organization Officer of Novartis since 2014 | Nationality: Belgian | Year of birth: 1974

Professional experience
- Global Head of Human Resources, Novartis Oncology, Switzerland (2012–2014)
- Head of Human Resources for the US and Canada, Novartis Pharmaceuticals, US (2009–2012)
- Head of Human Resources for Emerging Growth Markets, Novartis Pharmaceuticals, Switzerland (2008–2009)
- Head of Human Resources Global Functions, Novartis Pharmaceuticals, Switzerland (2006–2008)

Mandates
- Board member, WeSeeHope charity, US
- Represented Novartis on the board of GlaxoSmithKline Consumer Healthcare Holdings Ltd. (2015–2018)

Education
- Master of Business Administration, Vlerick Business School, Belgium
- Master of Laws, Katholieke Universiteit Leuven, Belgium
- Bachelor of Laws, Katholieke Universiteit Brussels, Belgium

Bertrand Bodson

Chief Digital Officer of Novartis from 2018 through January 31, 2021 | Mr. Bodson will step down from the Executive Committee on February 1, 2021 | Nationality: Belgian | Year of birth: 1975

Professional experience
- Chief digital and marketing officer, Sainsbury's Argos, UK (2013–2017)
- Executive vice president of the global digital business, EMI Music, UK (2010–2013)
- Co-founder and CEO, Bragster.com, UK (2006–2010)
- Senior group product manager, Amazon Inc., US and UK (2003–2006)

Mandates
- Member of the supervisory board, Wolters Kluwer NV, Netherlands
- Board member, Electrocomponents PLC, UK (2015–2021)

Education
- Master of Business Administration, Harvard Business School, US
- Master's degree in commercial engineering, Solvay Business School, Belgium/McGill University, Canada

James (Jay) Bradner, M.D.

President of the Novartis Institutes for BioMedical Research (NIBR) since 2016 | Nationality: American | Year of birth: 1972

Professional experience
- Associate professor, Department of Medicine, Harvard Medical School, US (2014–2016)
- Assistant professor, Department of Medicine, Harvard Medical School, US (2010–2014)
- Attending physician, Department of Medical Oncology, Dana-Farber Cancer Institute, US (2005–2015)
- Co-founder of five biotechnology companies
- Co-author of more than 250 scientific publications and 50 US patent applications

Mandates
- Science advisor for the Abdul Latif Jameel Clinic for Machine Learning in Health, Massachusetts Institute of Technology, US, and for Brigham and Women's Hospital, US
- Chairman, Genomics Institute of the Novartis Research Foundation, US

Education
- Doctor of medicine, University of Chicago Pritzker School of Medicine, US
- Bachelor's degree in biochemistry, Harvard University, US
- Postdoctoral training in chemistry and chemical biology, Harvard University, US
- Fellowship in medical oncology and hematology, Dana-Farber Cancer Institute, US
- Residency in medicine, Brigham and Women's Hospital, US

Harry Kirsch

Chief Financial Officer of Novartis since 2013 | Nationality: German/Swiss | Year of birth: 1965

Professional experience
- Chief Financial Officer of the Pharmaceuticals Division (now known as the Innovative Medicines Division), Novartis Pharmaceuticals, Switzerland (2010-2013)
- Chief Financial Officer of Pharma Europe, Novartis Pharmaceuticals, Switzerland (2008–2010)
- Head of Business Planning & Analysis for the Pharmaceuticals Division, Novartis Pharmaceuticals, Switzerland (2005–2008)
- Joined Novartis in 2003 as Head Finance Global Primary Care, and over the years held positions of increasing responsibility within Finance

Mandates
- Represented Novartis on the board of GlaxoSmithKline Consumer Healthcare Holdings Ltd. (2015–2018)

Education
- Diploma degree in industrial engineering and economics, University of Karlsruhe, Germany

Shannon Thyme Klinger

Chief Legal Officer of Novartis since 2018 | Nationality: American | Year of birth: 1971

Professional experience
- Chief Ethics, Risk & Compliance Officer, Novartis AG, Switzerland (April–May 2018)
- Chief Ethics and Compliance Officer and Global Head of Litigation, Novartis AG, Switzerland (2016–2018)
- General Counsel and Global Head of Legal, Sandoz International, Germany (2012–2016)
- General Counsel for North America, Sandoz Inc., US (2011–2012)
- Partner, Mayer Brown LLP, US (2010–2011)
- General counsel and senior vice president, Solvay Pharmaceuticals Inc., US (2008–2010)

Mandates
- Board member, SwissHoldings, the Swiss federation of industrial and service groups, Switzerland
- Board member, SIX Group, Switzerland (2016–2020)

Education
- Bar memberships: State of Georgia, District of Columbia, US
- Juris doctor with honors, University of North Carolina at Chapel Hill, US
- Bachelor's degree in psychology, University of Notre Dame, US

Steffen Lang, Ph.D.

Global Head of Novartis Technical Operations (NTO) since 2017 | Nationality: German/Swiss | Year of birth: 1967

Professional experience
- Global Head of Biologics Technical Development and Manufacturing, Novartis Technical Operations, Switzerland (2015–2017)
- Global Head of Technical Research and Development, Novartis Pharmaceuticals, Switzerland (2009–2015)
- Joined Novartis in 1994 as Head of Laboratory in Research, and over the years held positions of increasing responsibility within Pharmaceuticals Development

Mandates
- Board member, Bachem Holding AG, Switzerland

Education
- Doctorate in pharmaceutical technology, Swiss Federal Institute of Technology, Switzerland
- Master's degree in pharmaceutical sciences, University of Heidelberg, Germany

Klaus Moosmayer, Ph.D.

Chief Ethics, Risk & Compliance Officer of Novartis since 2018 | Nationality: German | Year of birth: 1968

Professional experience
- Chief compliance officer, Siemens AG, Germany (2014–2018)
- Chief counsel compliance, Siemens AG, Germany (2009–2013)
- Compliance operating officer, Siemens AG, Germany (2007–2009)

Mandates
- Vice chair, Business at OECD (BIAC) executive board, Paris
- Member of the advisory panel, Pharmaceutical Supply Chain Initiative, US
- Co-founder and board member, European Chief Compliance and Integrity Officers' Forum
- Chair of the Anti-Corruption Committee of the Business and Industry Advisory Committee (BIAC), Organization for Economic Co-operation and Development (OECD), Paris (2013–2020)
- Co-chair, B20 Integrity & Compliance Task Force under the G20 presidency of Saudi Arabia (2020)
- Co-chair, B20 Integrity & Compliance Task Force under the G20 presidency of Argentina (2018)
- Chair, B20 Integrity & Compliance Task Force under the G20 presidency of Germany (2017)

Education
- First and second state examination in law, Germany
- Doctor of jurisprudence, University of Freiburg, Germany

Richard Saynor

Chief Executive Officer of Sandoz since 2019 | Nationality: British | Year of birth: 1967

Professional experience
- Senior vice president of classic and established products, and commercial and digital platforms, GlaxoSmithKline (GSK) Pte. Ltd., UK (March–June 2019)
- Senior vice president and global head of classic and established products, GSK, UK (2014–2019)
- Senior vice president and global head of established products, GSK, UK (2013–2014)
- Senior vice president of classic brands and generics for Europe, Japan, and the emerging markets and Asia-Pacific (EMAP) region, GSK, Singapore (2010–2013)
- Region Head of Asian Markets, Sandoz International, Singapore (2008–2010)
- Region Head of Asia-Pacific, Latin America, Canada and Turkey, Sandoz International, Germany (2005–2008)

Mandates
- Member, Royal Pharmaceutical Society, UK
- Board member, GSK India, India (2018–2019)

Education
- Bachelor of Pharmacy, University of Bradford, UK

Susanne Schaffert, Ph.D.

President of Novartis Oncology since 2019 | Nationality: German | Year of birth: 1967

Professional experience
- Chairperson and President, Advanced Accelerator Applications, Switzerland (2018–2019)
- General Manager of Europe, Novartis Oncology, Italy (2012–2018)
- Global Head of Investor Relations, Novartis AG, Switzerland (2010–2012)
- Global Franchise Head for Immunology and Infectious Diseases, Novartis AG, Switzerland (2009–2010)
- General Manager of Northern and Central Europe, Novartis Oncology, Italy (2007–2009)
- General Manager of Germany, Novartis Oncology, Germany (2004–2007)

Mandates
- Board member, Novartis AG, Germany
- Board and executive committee member, European Federation of Pharmaceutical Industries and Associations (EFPIA), Belgium
- Represented Novartis on the board of GlaxoSmithKline Consumer Healthcare Holdings Ltd. (2015–2018)

Education
- Doctorate in organic chemistry, University of Erlangen, Germany

John Tsai, M.D.

Head of Global Drug Development and Chief Medical Officer for Novartis since 2018 | Nationality: American | Year of birth: 1967

Professional experience
- Chief medical officer and senior vice president of Global Medical, Amgen Inc., US (2017–2018)
- Global head of clinical development for marketed products, Bristol-Meyers Squibb Co. (BMS), US (2016–2017)
- Full development team leader in oncology, BMS, US (2015–2016)
- Head of Worldwide Medical, BMS, US (2014–2015)
- Chief medical officer for Europe, BMS, France (2012–2014)
- Vice president of US Medical, BMS, US (2010–2012)
- Vice president of Cardiovascular Medical, BMS, US (2006–2010)

Education
- Doctor of medicine, University of Louisville School of Medicine, US
- Bachelor of Science in electrical engineering, Washington University in St. Louis, US

Marie-France Tschudin

President of Novartis Pharmaceuticals since 2019 | Nationality: Swiss | Year of birth: 1971

Professional experience
- President, Advanced Accelerator Applications, France (March–June 2019)
- Europe Region Head, Novartis Pharmaceuticals, Switzerland (2017–2019)
- Corporate vice president of hematology and oncology for Europe, the Middle East and Africa, Celgene International, Switzerland (2014–2016)
- Regional vice president of northern Europe, Celgene International, Switzerland (2012–2014)
- General manager of Austria, Switzerland, the Czech Republic, Poland, Slovenia and Slovakia, Celgene International, Switzerland (2009–2011)
- Country manager of Switzerland, Celgene International, Switzerland (2008–2009)

Mandates
- Board member, AXA, France

Education
- Master of Business Administration, IMD business school, Switzerland
- Bachelor of Science, Georgetown University, US

Robert Weltevreden

Head of Novartis Business Services (NBS) from 2018 through January 31, 2021 | Head of Customer & Technology Solutions (CTS) as of February 1, 2021 | Nationality: Dutch | Year of birth: 1969

Professional experience
- Head of business services, Syngenta AG, Switzerland (2015–2017)
- Head of business process management, Syngenta AG, Switzerland (2014)
- Head of finance services, Syngenta AG, Switzerland, (2009–2014)
- Chief financial officer of the Asia-Pacific region, Syngenta Crop Protection AG, Singapore (2007–2009)

Education
- Master's degree in international finance, economics and business administration, Erasmus University Rotterdam, Netherlands
- Master of Business Administration in financial management, Vlerick Business School, Belgium

Information and control systems

The Board's information and control systems vis-à-vis management include a steady flow of information from senior management; monthly financial reports; a comprehensive and integrated risk management framework; an integrated assurance framework; and the independent evaluation of our risk management and internal control framework by Novartis Business Assurance & Advisory (NBAA).

Information from senior management

The Board ensures that it receives sufficient information from the Executive Committee through:

- Monthly CEO reporting (including detailed written updates from each division and business unit head), frequent communications from the CEO on current developments, and a yearly presentation
- Executive Committee meeting minutes
- Regular meetings/teleconferences by the Board and/or Board committees with the CEO and/or other members of the Executive Committee (e.g., the CFO, the Chief Legal Officer, the Chief Ethics, Risk & Compliance Officer), and occasional meetings/teleconferences with senior management (e.g., the Global Head of NBAA and Head of Internal Audit)
- Information from Executive Committee members or other Novartis associates, and visits to Novartis sites

To get an outside view, the Board and/or Board committees occasionally invite external advisors (e.g., the independent advisor of the Compensation Committee, the external auditor) to attend a meeting and/or represent a specific topic.

Monthly financial reports

Novartis produces comprehensive, consolidated (unaudited) financial statements on a monthly basis for the Group and its operating divisions. These are typically available within 10 days after the end of the month, and include the following:

- Consolidated income statement of the month and year to date, in accordance with International Financial Reporting Standards (IFRS), as well as adjustments to arrive at core results, as defined by Novartis (see "Item 5. Operating and Financial Review and Prospects—Item 5.A Operating results—Non-IFRS measures as defined by Novartis"). The IFRS and core figures are compared to the prior-year period and targets in both USD and on a constant currency basis.
- Supplementary data on a monthly and year-to-date basis, such as free cash flow and earnings per share on a USD basis

Management information related to the consolidated income statements and free cash flow is made available to Board members through the monthly CEO Report, including an analysis of key deviations from the prior year or target.

Prior to the release of each quarter's results, the Board receives the actual consolidated financial statement information and an outlook of the full-year results in accordance with IFRS and core results (as defined by Novartis), together with related commentary.

Annually, in the middle of the year, the Board approves the Company's strategic plan for the next three years. In the fourth quarter of the year, the Board approves the operating targets for the following year as well as the financial targets for the following three-year period, including a projected consolidated income statement in USD prepared in accordance with IFRS and non-IFRS measures as defined by Novartis (core results).

The Board does not have direct access to the Novartis financial and management reporting systems but can, at any time, request more detailed information.

Risk management

Overview

At Novartis, our continued success depends on our ability to manage risk. Our Board has ultimate oversight of the Enterprise Risk Management (ERM) system and regularly reviews the most significant risks and how these risks are managed. As further explained below, the Board is supported by its committees. Furthermore, our NBAA function provides an independent evaluation of risk management (see "—Item 6.C Board practices—Information and control systems—Novartis Business Assurance & Advisory").

BOARD COMMITTEES

RISK COMMITTEE
- Oversees the risk management system and processes
- Reviews, together with management, the prioritization and handling of risks, the risk portfolio, and actions implemented by management
- Performs deep dives into key risk areas and fosters a culture of smart risk-taking
- Receives updates at its four annual meetings from designated risk owners as well as the Chief Ethics, Risk & Compliance Officer and/or the Head of Risk & Resilience

AUDIT AND COMPLIANCE COMMITTEE
- Ensures that Internal Audit plans are aligned with key risks and that the function provides independent assurance and insights around these risks
- Works closely with the Risk Committee to minimize gaps in risk coverage
- Reviews the integrated assurance report with the Chief Ethics, Risk & Compliance Officer and the Global Head of NBAA and Head of Internal Audit
- Receives biannually a presentation from the Chief Ethics, Risk & Compliance Officer
- Pays particular attention to financial risk
- Has closed sessions individually with the Chief Ethics, Risk & Compliance Officer and the Global Head of NBAA and Head of Internal Audit

COMPENSATION COMMITTEE
- Works closely with the Risk Committee to ensure that the compensation system does not lead to excessive risk-taking (see "—Item 6.B Compensation—Compensation governance—Risk management principles")

EXECUTIVE COMMITTEE OF NOVARTIS

- Regularly assesses risks and fosters a culture of risk awareness, in line with the Novartis Values and Behaviors and the Novartis Code of Ethics

ETHICS, RISK & COMPLIANCE

- Governs the Novartis Code of Ethics
- Provides an integrated ERM framework (further described in the following section)
- Governs the global compliance program within Novartis

SENIOR LEADERS OF DIVISIONS, ORGANIZATIONAL UNITS AND GROUP FUNCTIONS, AT ALL LEVELS

- Provide appropriate risk management within their area of responsibility
- Establish adequate risk prevention and mitigation strategies when risk exposure is identified, including tracking progress and providing resources for possible actions
- Assess emerging risks, trends and overall exposure as part of the ERM process

Enterprise Risk Management framework

The Ethics, Risk & Compliance (ERC) function provides an integrated ERM framework to obtain a holistic view of Company risks and drive a culture of smart risk-taking. Under the leadership of the Chief Ethics, Risk & Compliance Officer, the Risk & Resilience team is responsible for the overall ERM process. This process covers, but is not limited to covering, risks associated with:
- The research, development, manufacturing, marketing and sales of products
- Finance; taxes; intellectual property; compliance with law and regulations; security; product safety; human resources; and health, safety and environmental protection
- Business objectives and strategies, including mergers and acquisitions
- External factors such as the social, political and economic environment

The ERM process continued to evolve in 2020 based on the Company's changing needs. The Risk & Resilience team conducted risk workshops and collaborated with all risk assurance functions to identify key risks across the Company. Each Novartis unit organized a focused risk workshop at the leadership team level. In parallel, risk workshops were held in the top 11 countries (by revenue) and in certain focus markets. Once key risks were identified, mitigation action plans were created to effectively address them. The findings from these workshops were consolidated into the Novartis Risk Compass, which enables senior management, the Executive Committee and the Board to focus discussions on key risks and more closely align our corporate strategy with our risk exposure and ways of working.

In 2020, we strengthened our ERM framework within the Novartis Risk & Resilience organization by further developing certain components. In addition to the ERM, Business Continuity Management (BCM) and Novartis Emergency Management (NEM) functions, we now have a Risk & Internal Control department to provide a holistic control framework, and a team to support Enterprise Policy Management (EPM).

Novartis Business Assurance & Advisory

NBAA brings together the SpeakUp Office, Internal Audit and Global Security. NBAA supports Novartis in achieving its objectives and culture transformation; identifying and managing major risks; and complying with policies, laws and regulations. NBAA conducts fair, timely and thorough investigations, and proactively shares insights, best practices, ongoing findings and root causes with the business to foster continuous learning.

SpeakUp Office

Our SpeakUp Office provides a safe place for associates to report potential misconduct. They have the option to do so anonymously.

Internal Audit

Our Internal Audit function executes the risk-based annual audit plan approved by the ACC at the Group and entity levels, and reports the results to the audited units, the Executive Committee and the ACC (in the form of formal quarterly presentations and audit report executive summaries). Potential material irregularities are escalated to the ACC and to the SpeakUp Office for triage and possible investigation, and action plans are developed together with the audited units. Internal Audit conducts desktop follow-up for high-risk findings prior to the due date for remediation actions. If the audit opinion is "needs major improvement," a follow-up audit takes place the next year. Audit findings and action plans are stored and monitored in a single application to enable efficient follow-up.

In 2020, a larger portion of the audit plan was dedicated to advisories, enabling more proactive risk management and forward-looking collaboration with the business. Additionally, Internal Audit developed a new approach called "internal reviews" to cover smaller markets, units that have not been audited for more than five years, and follow-up visits on "needs improvement" audits. The following outlines the number of audits, internal reviews and advisories performed in 2020, and key topics that we repeatedly observed in our work.

2020 INTERNAL AUDIT ACTIVITIES AND OBSERVATIONS

AUDITS
39

INTERNAL REVIEWS
6

ADVISORIES
17

Recurring observations relate to:

- Governance of data, data management, and oversight of digital initiatives
- IT security
- Third-party management
- Design of commercial processes, and applications of systems and policies
- Patient support programs and managed access programs

We performed 81% of planned activities (equating to 62 engagements) in 2020, most conducted remotely, despite the obstacles created by COVID-19. These engagements comprised 39 audits, 17 advisories and six internal reviews covering the entire value chain of Novartis and key risks. Internal Audit continues to invest in and refine its remote audit methodology.

NBAA and ERC continue to work toward integrated assurance by improving collaboration with other Novartis risk and assurance providers. This includes the coordination of internal plans, alignment on messaging and reporting, and increased communication around potential issues and risks.

NBAA leadership

Our Global Head of NBAA and Head of Internal Audit reports administratively to the CEO, and functionally to the Chair of the ACC, and meets with the latter and the Chairman of the Board at least quarterly. She has full access to the ACC and the Chairman of the Board, and confirms the organizational independence of the Internal Audit function annually to the ACC.

Auditors

Duration of the mandate and terms of office

On behalf of the Board, the ACC selects and nominates an independent auditor for election at the AGM. PwC assumed its existing auditing mandate for Novartis in 1996. Luc Schulthess, auditor in charge, began serving in his role in 2018, and Kris Muller, global relationship partner, began serving in her role in 2019. The ACC together with PwC ensure that these partners are rotated at least every five years.

Auditing fees and additional fees

The ACC monitors and preapproves the fees paid to the external auditor for all audit and non-audit services. It has developed and approved a policy with clear guidelines on the engagement of the independent auditor firm. This policy is designed to help ensure that the independence of the external auditor is maintained. It limits the scope of services that the external auditor may provide to the Group, stipulating certain permissible types of audit-related and non-audit services, including tax services and other services that have been preapproved by the ACC. The ACC preapproves all other services on a case-by-case basis.

The external auditor is required to report periodically to the ACC about the scope of the services it has provided to the Group and the fees for the services it has performed to date. PwC fees for professional services related to the 12-month periods ended December 31, 2020, and December 31, 2019, are as follows:

	2020 USD million	2019 USD million
Audit services	20.5	21.2
Audit-related services	1.4	1.0
Tax services	0.4	0.7
Other services	1.2	1.4
Total	**23.5**	**24.3**

Audit services include work performed to issue opinions on consolidated financial statements and parent company financial statements of Novartis AG, to issue opinions related to the effectiveness of the Group's internal control over financial reporting, and to issue reports on local statutory financial statements. Also included are audit services that generally can only be provided by the statutory auditor, such as the audit of the Compensation Report, audits of the adoption of new accounting policies, audits of information systems and the related control environment, as well as reviews of quarterly financial results.

Audit-related services include other assurance services provided by the independent auditor but not restricted to those that can only be provided by the statutory auditor. They include services such as audits of pension and other employee benefit plans; audits in connection with non-recurring transactions; contract audits of third-party arrangements; corporate responsibility assurance; and other audit-related services.

Tax services represent tax compliance, assistance with historical tax matters, and other tax-related services.

Other services include procedures related to corporate integrity agreements, benchmarking studies, and license fees for use of accounting and other reporting guidance databases.

Information to the Board and the ACC

The ACC, acting on behalf of the Board, is responsible for overseeing the activities of PwC. In 2020, this committee held eight meetings. PwC was invited to six of these meetings to attend the discussions on auditing matters and any other matters relevant to its audit.

The ACC recommended to the Board to approve the audited consolidated financial statements and the separate parent company financial statements of Novartis AG for the year ended December 31, 2020. The Board proposed the acceptance of these financial statements for approval by the shareholders at the next AGM.

The ACC regularly evaluates the performance of PwC and, based on this, once a year determines whether PwC should be proposed to the shareholders for re-election. To assess the performance of PwC, the ACC holds private meetings with the CFO and the Global Head of NBAA and Head of Internal Audit and, if necessary, obtains an independent external assessment. Criteria applied for the performance assessment of PwC include an evaluation of its technical and operational competence; its independence and objectivity; the sufficiency of the resources it has employed; its focus on areas of significant risk to Novartis; its willingness to probe and challenge; its ability to provide effective, practical recommendations; and the openness and effectiveness of its communications and coordination with the ACC, the Internal Audit function and management.

Once a year, the auditor in charge and the global relationship partner report to the Board on PwC's activities during the current year and on the audit plan for the coming year.

On an annual basis, PwC provides the ACC with written disclosures required by the US Public Company Accounting Oversight Board, and the committee and PwC discuss PwC's independence from Novartis.

Auditor tender process

In April 2020, the ACC decided to invite several audit firms, including PwC, to participate in a tender process that would lead to the selection of an external audit firm to be proposed for election at the 2022 AGM.

Key criteria in identifying potential participant firms included their expertise, experience and footprint to audit a company with our global scale and complexity of operations. The ACC determined that PwC, KPMG, Deloitte, and Ernst & Young met these criteria and invited them to participate in the tender process. The audit tender was conducted through a fair, transparent and balanced process according to defined selection criteria under a strong governance structure, ensuring that all audit firms had equal access to management and information.

In the first phase of the tender process, the firms had an introductory meeting with the CFO and the Head of Group FRA, were granted access to a data room containing both financial and organizational information, and met with select members of Group management. In the second phase, the firms submitted written proposals and made presentations to select members of Group management, including the CEO, the CFO and the Chief Legal Officer, and met with the Chair of the ACC. In the third phase, the entire ACC evaluated management's assessment of the four firms against the selection criteria and shortlisted two firms to present to the entire ACC, the Chairman, the CEO, the CFO, the Chief Legal Officer and the Head of Group FRA.

Based on the assessment of the two shortlisted firms against the selection criteria, the ACC plans to propose to the shareholders at the 2022 AGM the election of KPMG AG as the external auditor commencing for the 2022 financial year.

For the 2021 financial year, the ACC will propose to the shareholders at the 2021 AGM the re-election of PwC.

Information policy

Novartis is committed to open and transparent communication with shareholders, investors, financial analysts, customers, suppliers and other stakeholders. Novartis disseminates information about material developments in its businesses in a broad and timely manner that complies with the rules of the SIX Swiss Exchange and the NYSE.

Communications

Novartis publishes this Annual Report to provide information on the Group's results and operations. Novartis discloses financial results in accordance with IFRS on a quarterly basis, and issues press releases from time to time regarding business developments.

Novartis publishes press releases related to financial results and material events to the US Securities and Exchange Commission (SEC) via Form 6-K. An archive containing annual reports, US SEC Form 20-F, quarterly results releases, and all related materials – including presentations and conference call webcasts – is available at www.novartis.com/investors.

Novartis also publishes a Novartis in Society ESG Report, available at www.novartis.com/nisreport2020, which details progress on ESG topics and demonstrates the company's commitment in global health and corporate responsibility. The Novartis in Society ESG Report has been prepared in accordance with the Global Reporting Initiative (GRI) Standards: Core option, and fulfills the Company's reporting requirement as a signatory of the United Nations Global Compact.

The information on Board and Executive Committee compensation is outlined in the Compensation Report (see "—Item 6.B Compensation" in general, and for certain compensation information with respect to our Board that is responsive to Item 6.C.2 of Form 20-F, see "—Item 6.B Compensation—2020 Board compensation—Philosophy and benchmarking"). Please also refer to articles 29-35 of the Articles of Incorporation (www.novartis.com/investors/company-overview/corporate-governance). There are no change-of-control and "golden parachute" clauses benefiting Board members, Executive Committee members, or other members of senior management. Employment contracts with Executive Committee members are either for a fixed term not exceeding one year or for an indefinite period with a notice period not exceeding 12 months, and do not contain commissions for the acquisition or transfer of enterprises or severance payments. No loans or credits are granted to Board and Executive Committee members.

Information contained in reports and releases issued by Novartis is only correct and accurate at the time of release. Novartis does not update past releases to reflect subsequent events, and advises against relying on them for current information.

Investor Relations

Investor Relations manages the Group's interactions with the international financial community. Several events are held each year to provide institutional investors and analysts with various opportunities to learn more about Novartis.

Investor Relations is based at the Group's headquarters in Basel. Part of the team is located in the US to coordinate interaction with US investors. More information is available at www.novartis.com/investors.

Website information

Topic	Information
Share capital	Articles of Incorporation of Novartis AG www.novartis.com/investors/company-overview/corporate-governance Novartis key share data www.novartis.com/key-share-data
Shareholder rights	Articles of Incorporation of Novartis AG www.novartis.com/investors/company-overview/corporate-governance
Annual General Meeting of Shareholders	Annual General Meeting of Shareholders www.novartis.com/investors/shareholder-information/annual-general-meeting
Board Regulations	Board Regulations www.novartis.com/investors/company-overview/corporate-governance
Novartis code for senior financial officers	Novartis Code of Ethical Conduct for CEO and Senior Financial Officers www.novartis.com/investors/company-overview/corporate-governance
Novartis in Society ESG Report	Novartis in Society ESG Report www.novartis.com/nisreport2020
Novartis financial data	Novartis financial data www.novartis.com/investors/financial-data
Press releases	Press releases www.novartis.com/news/news-archive?type=press_release Free email service www.novartis.com/news/stay-up-to-date
Additional information (including Novartis investors event calendar, registered office, contact and email addresses, phone numbers, etc.)	Novartis Investor Relations www.novartis.com/investors

6.D Employees

The table below sets forth the breakdown of the total year-end number of our full-time equivalent employees by main category of activity and geographic area for the past three years.

For the year ended December 31, 2020 (full-time equivalents)	Marketing and sales	Production and supply	Research and development	NBS[1]	General and administration	Total
USA	5 978	2 954	5 554	636	820	**15 942**
Canada and Latin America	3 405	1 286	504	928	401	**6 524**
Europe	16 066	18 628	10 043	4 506	2 852	**52 095**
Asia/Africa/Australasia	17 240	3 346	4 537	4 991	1 119	**31 233**
Total	**42 689**	**26 214**	**20 638**	**11 061**	**5 192**	**105 794**

For the year ended December 31, 2019 (full-time equivalents)	Marketing and sales	Production and supply	Research and development	NBS[1]	General and administration	Total
USA	5 360	2 830	5 412	614	763	**14 979**
Canada and Latin America	3 396	838	480	864	397	**5 975**
Europe	16 395	19 386	9 988	4 352	2 666	**52 787**
Asia/Africa/Australasia	17 455	3 163	4 296	4 233	1 026	**30 173**
Total	**42 606**	**26 217**	**20 176**	**10 063**	**4 852**	**103 914**

For the year ended December 31, 2018 (full-time equivalents)	Marketing and sales	Production and supply	Research and development	NBS[1]	General and administration	Total
USA	6 825	7 524	6 700	1 467	911	**23 427**
Canada and Latin America	4 584	960	508	899	490	**7 441**
Europe	19 608	21 397	10 049	4 845	2 780	**58 679**
Asia/Africa/Australasia	20 099	6 636	3 977	3 613	1 289	**35 614**
Total	**51 116**	**36 517**	**21 234**	**10 824**	**5 470**	**125 161**
Thereof continuing operations[2]	*43 954*	*25 862*	*19 803*	*10 824*	*4 337*	*104 780*
Thereof discontinued operations[2]	*7 162*	*10 655*	*1 431*	*–*	*1 133*	*20 381*

[1] NBS relates to full-time equivalent employees from our Novartis Business Services organizational unit.
[2] Continuing operations include the businesses of the Innovative Medicines and Sandoz Divisions and the continuing Corporate activities, and discontinued operations include the Alcon eye care devices business and certain corporate activities attributable to Alcon prior to the spin-off. See "Item 18. Financial Statements—Note 2. Significant transactions—Significant transactions in 2019."

As of December 31, 2019, the number of our full-time equivalent employees decreased by 21 247 compared to December 31, 2018, mainly due to the April 2019 completion of the Alcon spin-off. For more information on this transaction, please see "Item 18. Financial Statements—Note 2. Significant transactions in 2019."

A significant number of our associates are represented by unions or works councils. We have not experienced any material work stoppages in recent years, and we consider our employee relations to be good.

6.E Share ownership

The information set forth under "Item 6. Directors, Senior Management and Employees—Item 6.B Compensation—2020 Executive Committee compensation—Additional disclosures for the CEO and other Executive Committee members—Shares, ADRs and other equity rights owned by Executive Committee members at December 31, 2020" and under "Item 6. Directors, Senior Management and Employees—Item 6.B Compensation—2020 Board compensation—Additional disclosures—Shares, ADRs and share options owned by Board members" is incorporated by reference. For more information on our equity-based participation plans, see the information set forth under "Item 18. Financial Statements—Note 26. Equity-based participation plans for associates," which is incorporated by reference.

Item 7. Major Shareholders and Related Party Transactions

7.A Major shareholders

Novartis shares are widely held. As of December 31, 2020, Novartis had approximately 176 000 shareholders listed in the Novartis Share Register, representing approximately 67.9% of issued shares. Based on the Novartis Share Register and excluding treasury shares, approximately 44.1% of the shares registered by name were held in Switzerland, and approximately 24.4% were held in the US. Approximately 14% of the shares registered in our share register were held by individual investors, while approximately 34.5% were held by legal entities (excluding 4.3% of our share capital held as treasury shares by Novartis AG or its fully owned subsidiaries), and 51.5% by nominees, fiduciaries and the ADS depositary.

Based on our share register, we believe that we are not directly or indirectly owned or controlled by another corporation or government, or by any other natural or legal persons. There are no arrangements that may result in a change of control.

The tables below set forth information with respect to our major shareholders according to our share register as of December 31, 2020, excluding 4.3% of our share capital held as treasury shares by Novartis AG or its fully owned subsidiaries. The following registered shareholders (including nominees and the ADS depositary) held more than 2% of the total share capital of Novartis with the right to vote all their Novartis shares based on an exemption granted by the Board of Directors:

		% of respective share capital beneficially owned as of:		
	Ordinary shares beneficially owned as of Dec 31, 2020	**Dec 31, 2020**	Dec 31, 2019	Dec 31, 2018
Shareholders registered for their own account:				
Emasan AG, Basel, Switzerland	89 135 960	3.6	3.5	3.5
Novartis Foundation for Employee Participation, Basel, Switzerland [1]	-	<2.0	2.1	2.3
UBS Fund Management (Switzerland) AG, Basel, Switzerland	56 764 402	2.3	2.1	2.2
Credit Suisse Funds AG, Zurich, Switzerland	50 187 090	2.0	<2.0	<2.0

[1] The Novartis Foundation for Employee Participation (the "Employee Foundation") is a special purpose entity that was founded by, but is independent from, Novartis.

		% of respective share capital held as of:		
	Ordinary shares held as of Dec 31, 2020	**Dec 31, 2020**	Dec 31, 2019	Dec 31, 2018
Shareholders registered as nominees:				
Chase Nominees Ltd., London, England	237 417 808	9.6	10.4	9.8
The Bank of New York Mellon, New York, NY	83 805 997	3.4	3.8	4.1
Through The Bank of New York Mellon, Everett, MA	*41 574 113*	*1.7*	*2.0*	*2.1*
Through The Bank of New York Mellon, New York, NY	*28 683 674*	*1.2*	*1.2*	*1.3*
Through The Bank of New York Mellon, SA/NV, Brussels, Belgium	*13 548 210*	*0.5*	*0.6*	*0.7*
Nortrust Nominees Ltd., London, England	104 327 562	4.2	3.9	3.6
Shareholder acting as American Depositary Share (ADS) depositary:				
JPMorgan Chase Bank, N.A., New York, NY	288 785 853	11.7	12.5	13.3

According to a disclosure notification filed with Novartis AG, Norges Bank (Central Bank of Norway), Oslo, Norway, held 2.3% of the share capital of Novartis AG, or 56 513 527 shares, as of December 31, 2020, but was not registered in our share register as of December 31, 2020. Provided that these shares are registered in the share register on the record date of the Annual General Meeting, Norges Bank will have full voting rights for all of these shares.

According to a disclosure notification filed with Novartis AG and the SIX Swiss Exchange, BlackRock, Inc., New York, NY, held between 3% and 5%, but was registered with less than 2% of the share capital of Novartis AG in our share register as of December 31, 2020.

According to disclosure notifications filed with Novartis AG and the SIX Swiss Exchange, The Capital Group Companies, Inc., Los Angeles, California, held

between 3% and 5%, but was not registered in our share register as of December 31, 2019, and December 31, 2018.

As of December 31, 2020, no other shareholder was registered as owner of more than 2% of the registered share capital.

The Articles of Incorporation provide that no shareholder shall be registered with the right to vote shares comprising more than 2% of the registered share capital. The Board of Directors may, upon request, grant an exemption from this restriction. Considerations include whether the shareholder supports the Novartis goal of creating sustainable value and has a long-term investment horizon. In 2020, the Board approved an exemption requested by Credit Suisse Funds AG, Zurich, based on the fulfilment of the requirements described above. Exemptions are in force for the registered major shareholders as described above. Novartis has not entered into any agreement with any shareholder regarding the voting or holding of Novartis shares.

7.B Related party transactions

The information set forth under "Item 18. Financial Statements—Note 27. Transactions with related parties" is incorporated by reference.

7.C Interests of experts and counsel

Not applicable.

Item 8. Financial Information

8.A Consolidated statements and other financial information

See "Item 18. Financial Statements."

Dividend policy

Subject to the dividend policy described below, our Board of Directors expects to recommend the payment of a dividend in respect of each financial year. If approved by our shareholders at the relevant annual shareholders' meeting, the dividends will be payable shortly following such approval. Any shareholder who purchases our shares before the ex-dividend date and holds the shares until that date shall be deemed to be entitled to receive the dividends approved at that meeting. Dividends are reflected in our financial statements in the year in which they are approved by our shareholders.

Our dividend policy is to pay a growing annual dividend in Swiss francs. This policy is subject to our financial conditions and outlook at the time, the results of our operations, and other factors.

The Board will propose a dividend of CHF 3.00 per share to the shareholders for approval at the Annual General Meeting to be held on March 2, 2021. Because we pay dividends in Swiss francs, exchange rate fluctuations will affect the US dollar amounts received by holders of ADRs. For a summary of dividends we paid in the past five years, see "Item 3. Key Information—Item 3.A Selected financial data—Cash dividends per share."

Disclosure pursuant to Section 219 of the Iran Threat Reduction & Syria Human Rights Act (ITRA)

At Novartis, our purpose is to reimagine medicine to improve and extend people's lives, regardless of where they live. This includes the compliant sale of medicines and other healthcare products worldwide. To help us fulfill this mission, we have for many years maintained two representative offices located in Iran.

As of October 18, 2010, a non-US affiliate within our Innovative Medicines Division entered into a non-binding Memorandum of Understanding (MoU) with the Ministry of Health and Medical Education of the Islamic Republic of Iran. Pursuant to the MoU, the Iranian Ministry of Health acknowledges certain benefits that may apply to sales of certain Innovative Medicines Division medicines by third-party distributors in Iran. These include fast-track registration, market exclusivity, end-user subsidies, and exemptions from customs tariffs. Novartis receives no payments from the Iranian Ministry of Health under the MoU, and the MoU creates no obligations on the part of either Novartis or the Iranian Ministry of Health.

From time to time, including in 2020, non-US affiliates in our Innovative Medicines and Sandoz Divisions made payments to government entities in Iran related to patents, trademarks, exit fees and other transactions ordinarily incident to travel by doctors and other medical professionals resident in Iran to attend conferences or other events outside Iran.

From time to time, including in 2020, non-US affiliates in our Innovative Medicines and Sandoz Divisions enter into agreements with hospitals, research institutes, medical associations and universities in Iran to provide grants and sponsor congresses, seminars and symposia, and with doctors and other healthcare professionals for consulting services, including participation in advisory boards and investigator services for observational (non-interventional) studies. Some hospitals and research institutes are owned or controlled by the government of Iran, and some doctors and healthcare professionals are employed by hospitals that may be public or government-owned.

Because our Innovative Medicines and Sandoz Divisions have operations in Iran, including employees, they obtain services and have other dealings incidental to their activities in that country, including paying taxes and salaries either directly or indirectly through a service provider, and obtaining office rentals, insurance, electricity, water and telecommunications services, office and similar supplies, and customs-related services from Iranian companies that may be owned or controlled by the government of Iran. In addition, from time to time, representatives of our non-US affiliates participate in meetings with Iranian officials to discuss issues relevant to our business and the pharmaceutical industry.

Non-US affiliates in our Innovative Medicines and Sandoz Divisions maintain local accounts at banks that are, as of November 5, 2018, on the Specially Designated Nationals and Blocked Persons List (SDN List). These non-US affiliates make local transactions for employee payroll and local vendor payment purposes. These transactions are conducted for the purpose of facilitating the provision of medicine to Iran, in line with the humanitarian exceptions contained in Section 11 of Executive Order 13902 and other applicable sanctions by legal authorities. No transactions are made with an Iranian financial institution designated on the SDN List in connection with Iran's support for international terrorism or proliferation of weapons of mass destruction.

8.B Significant changes

None.

Item 9. The Offer and Listing

9.A Offer and listing details

Our shares are listed in Switzerland on the SIX Swiss Exchange (SIX).

ADSs, each representing one share, have been available in the US through an ADR program since December 1996. This program was established pursuant to a deposit agreement that we entered into with JPMorgan Chase Bank, N.A., as depositary ("Deposit Agreement").

Our ADRs have been listed on the NYSE since May 2000 and are traded under the symbol NVS.

The depositary has informed us that as of January 20, 2021, there were 289 million ADRs outstanding, each representing one Novartis share (approximately 12% of total Novartis shares issued). On January 20, 2021, the closing price per share on the SIX was CHF 86.01 and USD 96.92 per ADR on the NYSE.

9.B Plan of distribution

Not applicable.

9.C Markets

See "—Item 9.A Offer and listing details."

9.D Selling shareholders

Not applicable.

9.E Dilution

Not applicable.

9.F Expenses of the issue

Not applicable.

Item 10. Additional Information

10.A Share capital

Not applicable.

10.B Memorandum and articles of association

The following is a non-exhaustive summary of certain provisions of our Articles of Incorporation ("Articles"), our Regulations of the Board, the Board Committees and the Executive Committee ("Board Regulations") and of Swiss law, particularly the Swiss Code of Obligations ("Swiss CO"), and is qualified in its entirety by reference to the Articles and the Board Regulations, which are an exhibit to this Form 20-F, and to Swiss law.

10.B.1 Company purpose

Novartis AG is registered in the commercial register of the canton of Basel-Stadt, Switzerland, under number CHE-103.867.266. Our business purpose, as stated in Article 2 of the Articles, is to hold interests in enterprises in the area of healthcare or nutrition. We may also hold interests in enterprises in the areas of biology, chemistry, physics, information technology or related areas. We may acquire, mortgage, liquidate or sell real estate and intellectual property rights in Switzerland or abroad. In pursuing our business purpose, we strive to create sustainable value.

10.B.2 Directors

According to our Articles, the Board of Directors ("Board") consists of a minimum of eight and a maximum of 16 members. The members of the Board (including the Chairman) are elected individually by the General Meeting of Shareholders ("General Meeting") for a one year term of office lasting until completion of the next Annual General Meeting of Shareholders ("AGM").

(a) A board resolution requires the affirmative majority of the votes cast. According to our Board Regulations, a member of our Board ("Director") may not participate in decisions and resolutions on matters that affect, or reasonably might affect, the Director's interests or the interests of a person close to the Director.

(b) Compensation of the Directors is subject to the approval of the aggregate amounts of such compensation by a shareholders' resolution under the Ordinance against Excessive Compensation in Public Companies of the Swiss Federal Council.

(c) The Articles prohibit the granting of loans or credits to Directors.

(d) Directors who have turned 70 years of age at the date of the General Meeting may no longer be elected as members of the Board. The General Meeting may, under special circumstances, grant exceptions to this rule.

(e) Our Directors are not required to be shareholders at the time of the election by the General Meeting. However, according to our share ownership guidelines, the Chairman is required to own a minimum of 30 000 Novartis AG shares, and other Directors are required to own at least 5 000 Novartis AG shares within five years after joining the Board, to ensure their interests are aligned with those of our shareholders.

10.B.3 Shareholder rights

Because Novartis AG has only one class of registered shares, the following information applies to all shareholders.

(a) Under the Swiss CO, we may only pay dividends out of balance sheet profits or out of distributable reserves. In any event, under the Swiss CO, while the Board may propose that a dividend be paid, we may only pay dividends upon shareholders' approval at a General Meeting. Furthermore, the Swiss CO requires us to accrue general legal reserves under certain circumstances so long as these reserves amount to less than 20% of our registered share capital, and Swiss law and the Articles permit us to accrue additional reserves beyond the statutory reserves. Our auditors must confirm that the dividend proposal of our Board conforms with the Swiss CO and the Articles. Our Board expects to recommend the payment of a dividend in respect of each financial year. See "Item 3. Key Information—Item 3.A. Selected financial data—Cash dividends per share" and "Item 8. Financial Information—Item 8.A. Consolidated statements and other financial information—Dividend policy."

Dividends are usually due and payable shortly after the shareholders have passed a resolution approving the payment. Dividends that have not been claimed within five years after the due date revert to us and are allocated to our general reserves. For information about deduction of the withholding tax or other duties from dividend payments, see "—Item 10.E Taxation."

(b) Each share is entitled to one vote at a General Meeting. Voting rights may only be exercised for shares registered with the right to vote on the record date

for the applicable General Meeting. In order to do so, the shareholder must file a share registration form with us, setting forth the shareholder's name, address and citizenship (or, in the case of a legal entity, its registered office). If the shareholder has not timely registered its shares, then the shareholder may not vote at, or participate in, a General Meeting.

To vote its shares, the shareholder must also explicitly declare that it has acquired the shares in its own name and for its own account. If the shareholder refuses to make such a declaration, the shares may not be voted unless the Board recognizes such shareholder as a nominee.

The Articles provide that no shareholder shall be registered with the right to vote shares comprising more than 2% of the registered share capital. The Board may, upon request, grant an exemption from this restriction. Considerations include whether the shareholder supports our goal of creating sustainable value and has a long-term investment horizon. Furthermore, the Articles provide that no nominee shall be registered with the right to vote shares comprising more than 0.5% of the registered share capital. The Board may, upon request, grant an exemption from this restriction if the nominee discloses the names, addresses and number of shares of the persons for whose account it holds 0.5% or more of the registered share capital. The same restrictions indirectly apply to ADR holders. We have in the past granted exemptions from the 2% rule for shareholders and the 0.5% rule for nominees.

For purposes of the 2% rule for shareholders and the 0.5% rule for nominees, groups of companies and groups of shareholders acting in concert are considered to be one shareholder. These rules also apply to shares acquired or subscribed by the exercise of subscription, option or conversion rights.

After hearing the registered shareholder or nominee, the Board may cancel, with retroactive effect as of the date of registration, the registration of the shareholders if the registration was effected based on false information.

Registration restrictions in the Articles may only be removed upon a resolution carrying a two-thirds majority of the votes represented at a General Meeting.

Except as noted below, shareholders' resolutions require the approval of an absolute majority of the votes present at a General Meeting. As a result, abstentions have the effect of votes against such resolutions. Some examples of shareholders' resolutions requiring a vote by such "absolute majority of the votes" are:

- Adoption and amendment of the Articles
- Election and removal of the Chairman, the Board and Compensation Committee members, the Independent Proxy and the external auditor
- Approval of the management report and of the consolidated financial statements
- Approval of the financial statements of Novartis AG, and decision on the appropriation of available earnings shown on the balance sheet, including dividends, if any
- Approval of the maximum aggregate compensation of the Board (from an AGM until the next AGM) and of the Executive Committee (for the financial year following the AGM)
- Discharge of Board and Executive Committee members from liability for matters disclosed to the General Meeting
- Decision on other matters that are reserved by law or by the Articles (e.g., advisory vote on the Compensation Report) to the General Meeting

According to the Articles and Swiss law, the following matters require the approval of a "supermajority" of at least two-thirds of the votes present at a General Meeting:

- Alteration of the purpose of Novartis AG
- Creation of shares with increased voting powers
- Implementation of restrictions on the transfer of registered shares, and the removal of such restrictions
- Authorized or conditional increase of the share capital
- Increase of the share capital out of equity, by contribution in kind, for the purpose of an acquisition of property or the grant of special rights
- Restriction or cancellation of subscription rights
- Change of the registered office of Novartis AG
- Dissolution of Novartis AG

In addition, the law provides for a qualified majority for other resolutions, such as a merger or demerger.

Our shareholders are required to annually elect all Directors (including the Chairman), the Compensation Committee members, the external auditor and the Independent Proxy. The Articles do not provide for cumulative voting of shares.

At a General Meeting, shareholders can be represented by a proxy, which must either be the shareholder's legal representative, another shareholder with the right to vote, or the Independent Proxy. Votes are taken either by a show of hands or by electronic voting, unless the General Meeting resolves to have a ballot or where a ballot is ordered by the chair of the meeting. However, in accordance with Swiss legislation passed in response to the COVID-19 pandemic, the Board has decided that voting rights at our 2021 AGM can only be exercised through the Independent Proxy. It will not be possible to physically attend our 2021 AGM.

ADSs, each representing one Novartis AG share and evidenced by ADRs, are issued by our depositary JPMorgan Chase Bank, N.A., New York, and not by us. The ADR is vested with rights defined and enumerated in the Deposit Agreement (such as the rights to vote, to receive a dividend and to receive a share of Novartis AG in exchange for a certain number of ADRs). The enumeration of rights, including any limitations on those rights in the Deposit Agreement, is final. There are no other rights given to the ADR holders. Only the ADS depositary, holding our shares underlying the ADRs, is registered as shareholder in our share register. An ADR is not a Novartis AG share and an ADR holder is not a Novartis AG shareholder.

The Deposit Agreement between our depositary, the ADR holder and us has granted certain indirect rights to vote to the ADR holders. ADR holders may not attend a General Meeting in person. ADR holders exercise their voting rights by instructing JPMorgan Chase Bank, N.A., our depositary, to exercise the voting rights attached to the registered shares underlying the ADRs. Each ADR represents one Novartis AG share. JPMorgan Chase Bank, N.A., exercises the voting rights for registered shares underlying ADRs for which no voting instructions have been given by providing a discretionary proxy to an uninstructed independent designee. Such designee has to be a shareholder of Novartis AG. The same voting restrictions apply to ADR holders as to those holding Novartis AG shares (i.e., the right to vote up to 2% of the Novartis AG registered share capital – unless otherwise granted an exemption by the Board – and the disclosure requirement for nominees).

(c) Shareholders have the right to allocate the profit shown on our balance sheet and to distribute dividends by vote taken at the General Meeting, subject to the legal requirements described in "Item 10.B.3(a) Shareholder rights."

(d) Under the Swiss CO, any surplus arising out of a liquidation of Novartis AG (i.e., after the settlement of all claims of all creditors) would be distributed to the shareholders in proportion to the paid-in nominal value of their shares.

(e) The Swiss CO limits a corporation's ability to hold or repurchase its own shares. We and our subsidiaries may only repurchase shares if we have sufficient freely disposable equity in the amount of the purchase price of the acquired shares. The aggregate nominal value of all Novartis AG shares held by us and our subsidiaries may not exceed 10% of our registered share capital. However, it is accepted that a Swiss corporation may repurchase its own shares beyond the statutory limit of 10% if the repurchased shares are clearly earmarked for cancellation. In addition, we are required to recognize a negative position, or if our subsidiaries acquire our shares, to create a special reserve on our balance sheet in the amount of the purchase price of the acquired shares. Repurchased shares held by us or our subsidiaries do not carry any rights to vote at a General Meeting, but are entitled to the economic benefits generally connected with the shares. The definition of subsidiaries, and therefore, treasury shares, for purposes of the above described reserves requirement and voting restrictions differs from the definition of subsidiaries for purposes of consolidation in our consolidated financial statements. The definition in the consolidated financial statements requires consolidation for financial reporting purposes of special purpose entities in instances where we have the power to govern the financial and operating policies of the entity so as to obtain benefits from its activities. Therefore, our consolidated financial statements include special purpose entities, mainly foundations, which do not qualify as subsidiaries subject to the reserve requirements and voting restrictions of the Swiss CO because we do not hold a majority participation in these special purpose entities. Accordingly, no reserve requirements apply to shares held by such special purpose entities, and such entities are not restricted from independently voting their shares.

Under the Swiss CO, we may not cancel treasury shares without the approval of a capital reduction by our shareholders.

(f) Not applicable.

(g) Since all of our issued and outstanding shares have been fully paid in, our shareholders are not obliged to make further contributions with respect to their shares.

(h) See "—Item 10.B.3(b) Shareholder rights" and "—Item 10.B.7 Change in control."

10.B.4 Changes to shareholder rights

Under the Swiss CO, we may not issue new shares without the prior approval of a capital increase by our shareholders. If a capital increase is approved, then our shareholders would generally have certain pre-emptive rights to obtain newly issued shares in an amount proportional to the nominal value of the shares they already hold. These pre-emptive rights could be excluded in certain limited circumstances with the approval of a resolution adopted at a General Meeting by a supermajority of two-thirds of the votes. In addition, we may not create shares with increased voting powers or place restrictions on the transfer of registered shares without the approval of a resolution adopted at a General Meeting by a supermajority of votes. In addition, see "—Item 10.B.3(b) Shareholder rights" with regard to the Board's ability to cancel the registration of shares under limited circumstances.

10.B.5 Shareholder meetings

Under the Swiss CO and the Articles, we must hold an AGM within six months after the end of our financial year. A General Meeting may be convened by the Board or, if necessary, by the external auditor. The Board is further required to convene an extraordinary General Meeting if so resolved by a General Meeting, or if so requested by shareholders representing at least 10% of the share capital, specifying the items for the agenda and their proposals. Shareholders representing shares with an aggregate nominal value of at least CHF 1 000 000 may request that an item be included in a General Meeting agenda. A General Meeting is convened by publishing a notice in the Swiss Official Gazette of Commerce

(*Schweizerisches Handelsamtsblatt*) at least 20 days prior to such meeting. Shareholders may also be informed by mail. Neither the Swiss CO nor the Articles require a quorum for a General Meeting. In addition, see "—Item 10.B.3(b) Shareholder rights" regarding conditions for exercising a shareholder's right to vote at a General Meeting.

10.B.6 Limitations

There are no limitations under the Swiss CO or our Articles on the right of non-Swiss residents or nationals to own or vote shares other than the restrictions applicable to all shareholders. But see "—Item 10.B.3(b) Shareholder rights" regarding conditions for exercising an ADR holder's right to vote at a shareholder meeting.

10.B.7 Change in control

The Articles and the Board Regulations contain no provision that would have an effect of delaying, deferring or preventing a change in control of Novartis AG and that would operate only with respect to a merger, acquisition or corporate restructuring involving us or any of our subsidiaries.

According to the Swiss Merger Act, shareholders may pass a resolution to merge with another corporation at any time. Such a resolution would require the consent of at least two-thirds of all votes present at the necessary General Meeting.

Under the Swiss Financial Market Infrastructure Act, shareholders and groups of shareholders acting in concert who acquire more than 33 1/3% of our shares would be under an obligation to make an offer to acquire all remaining Novartis AG shares. Novartis AG has neither opted out from the mandatory takeover offer obligation nor opted to increase the threshold for mandatory takeover offers in its Articles.

10.B.8 Disclosure of shareholdings

Under the Swiss Financial Market Infrastructure Act, persons who directly, indirectly or in concert with other parties acquire or dispose of our shares or purchase or sale rights relating to our shares are required to notify us and the SIX of the level of their holdings whenever such holdings reach, exceed or fall below certain thresholds – 3%, 5%, 10%, 15%, 20%, 25%, 33 1/3%, 50% and 66 2/3% – of the voting rights represented by our share capital (whether exercisable or not). This also applies to anyone who has discretionary power to exercise voting rights associated with our shares. Following receipt of such notification, we are required to inform the public by publishing the information via the electronic publication platform operated by the SIX.

An additional disclosure obligation exists under the Swiss CO that requires us to disclose, once a year in the notes to the financial statements published in our Annual Report, the identity of all of our shareholders (or related groups of shareholders) who have been granted exemption entitling them to vote more than 2% of our registered share capital, as described in "—Item 10.B.3(b) Shareholder rights."

10.B.9 Differences in the law

See the references to Swiss law throughout this "—Item 10.B Memorandum and articles of association."

10.B.10 Changes in capital

The requirements of the Articles regarding changes in capital are not more stringent than the requirements of Swiss law.

10.C Material contracts

Alcon spin-off

In connection with the spin-off of our Alcon business, we entered into a Separation and Distribution Agreement, a Tax Matters Agreement and several other agreements with Alcon to effect the separation of the Alcon business and provide a framework for our relationship with Alcon after the spin-off.

The Separation and Distribution Agreement sets forth the parties' agreements regarding the principal actions to be taken in connection with the separation of the Alcon business and the spin-off, including the conditions of the spin-off and the rights and obligations of the parties with respect to the distribution. The Separation and Distribution Agreement identifies the assets to be transferred, liabilities to be assumed and contracts to be assigned to each of Novartis and Alcon as part of the internal transactions effected prior to the distribution, and provides for when and how such transfers, assumptions and assignments should occur.

The Tax Matters Agreement imposes certain restrictions and indemnity obligations on Alcon designed to preserve the tax-neutral nature of the spin-off for Swiss tax and US federal income tax purposes. The Tax Matters Agreement also provides that Alcon will generally indemnify Novartis for any taxes of Novartis and its subsidiaries to the extent such taxes are attributable to the Alcon business, and Novartis will generally indemnify Alcon for any of Alcon's or its subsidiaries' taxes to the extent such taxes are attributable to the Novartis retained businesses.

In connection with the spin-off, we also entered into an employee matters agreement, a transition services agreement, forward and reverse manufacturing supply agreements, and certain intellectual property agreements, each of which is not material to Novartis.

Acquisition of The Medicines Company

On November 23, 2019, we entered into an Agreement and Plan of Merger (the "Merger Agreement") with US-based pharmaceutical company The Medicines Company. Pursuant to the Merger Agreement, on December 5, 2019, Novartis, through a subsidiary, commenced a tender offer to acquire all outstanding shares of The Medicines Company for USD 85 per share, or a total consideration of approximately USD 9.6 billion in cash on a fully diluted basis. The tender offer expired on January 3, 2020, and on January 6, 2020, the acquiring subsidiary merged with and into The Medicines Company, resulting in The Medicines Company becoming an indirect wholly owned subsidiary of Novartis. This merger broadens our cardiovascular portfolio by adding inclisiran, an investigational cholesterol-lowering therapy.

10.D Exchange controls

There are no Swiss governmental laws, decrees or regulations that affect – in a manner material to Novartis AG – the export or import of capital, including the availability of cash and cash equivalents for use by Novartis or any foreign exchange controls that affect the remittance of dividends, interest or other payments to non-residents or non-citizens of Switzerland who hold Novartis AG securities.

10.E Taxation

The taxation discussion set forth below is intended only as a descriptive summary and does not purport to be a complete analysis or listing of all potential tax effects relevant to the ownership or disposition of our shares or ADRs. The statements of US and Swiss tax laws set forth below are based on the laws and regulations in force as of the date of this 20-F – including the current Convention Between the US and the Swiss Confederation for the Avoidance of Double Taxation with Respect to Taxes on Income, entered into force on December 19, 1997 ("the Treaty"); the US Internal Revenue Code of 1986, as amended ("the Code"); Treasury regulations; rulings; judicial decisions; and administrative pronouncements – and may be subject to any changes in US and Swiss law, and in any double taxation convention or treaty between the US and Switzerland occurring after that date, which changes may have retroactive effect.

Swiss taxation

Swiss residents

Withholding Tax on dividends and distributions. Dividends that we pay and similar cash or in-kind distributions that we may make to a holder of shares or ADRs (including distributions of liquidation proceeds in excess of the nominal value, stock dividends and, under certain circumstances, proceeds from repurchases of shares by us in excess of the nominal value) are generally subject to a Swiss federal withholding tax ("the Withholding Tax") at a current rate of 35%. Under certain circumstances, distributions out of capital contribution reserves made by shareholders after December 31, 1996, are exempt from the Withholding Tax. We are required to withhold Withholding Tax due from the gross distribution and to pay the Withholding Tax to the Swiss Federal Tax Administration. The Withholding Tax is refundable in full to Swiss tax residents who are the beneficial owners of the taxable distribution at the time it is resolved and duly report the gross distribution received on their personal tax return or in their financial statements for tax purposes, as the case may be.

Income tax on dividends. A Swiss tax resident who receives dividends and similar distributions (including stock dividends and liquidation surplus) on shares or ADRs is required to include such amounts in the shareholder's personal income tax return. However, distributions out of qualified capital contribution reserves are not subject to income tax. A corporate shareholder may claim substantial relief from taxation of dividends and similar distributions received if the shares held represent a fair market value of at least CHF 1 million.

Capital gains tax upon disposal of shares. Under current Swiss tax law, the gain realized on shares held by a Swiss resident who holds shares or ADRs as part of his private property is generally not subject to any federal, cantonal or municipal income taxation on gains realized on the sale or other disposal of shares or ADRs. However, gains realized upon a repurchase of shares by us may be characterized as taxable dividend income if certain conditions are met. Book gains realized on shares or ADRs held by a Swiss corporate entity or by a Swiss resident individual as part of the shareholder's business property are, in general, included in the taxable income of such person. However, the Federal Law on the Direct Federal Tax of December 14, 1990, and several cantonal laws on direct cantonal taxes provide for exceptions for Swiss corporate entities holding more than 10% of our voting stock for more than one year.

Residents of other countries

Recipients of dividends and similar distributions on our shares who are neither residents of Switzerland for tax purposes nor holding shares as part of a business conducted through a permanent establishment situated in Switzerland ("Non-Resident Holders") are not subject to

Swiss income taxes in respect of such distributions. Moreover, gains realized by such recipients upon the disposal of shares are not subject to Swiss income taxes.

Non-Resident Holders of shares are, however, subject to the Withholding Tax on dividends and similar distributions mentioned above and, under certain circumstances, to the Stamp Duty described below. Such Non-Resident Holders may be entitled to a partial refund of the Withholding Tax if the country in which they reside has entered into a bilateral treaty for the avoidance of double taxation with Switzerland. Non-Resident Holders should be aware that the procedures for claiming treaty refunds (and the time frame required for obtaining a refund) may differ from country to country. Non-Resident Holders should consult their own tax advisors regarding receipt, ownership, purchase, sale or other dispositions of shares or ADRs, and the procedures for claiming a refund of the Withholding Tax.

As of January 1, 2021, Switzerland has entered into bilateral treaties for the avoidance of double taxation with respect to income taxes with the following countries, whereby a part of the above-mentioned Withholding Tax may be refunded (subject to the limitations set forth in such treaties):

Albania
Algeria
Argentina
Armenia
Australia
Austria
Azerbaijan
Bahrain
Bangladesh
Belarus
Belgium
Bulgaria
Canada
Chile
China
Colombia
Croatia
Cyprus
Czech Republic
Denmark
Ecuador
Egypt
Estonia
Finland
France
Georgia
Germany
Ghana
Greece
Hong Kong
Hungary
Iceland
India
Indonesia
Iran
Republic of Ireland
Israel
Italy
Ivory Coast
Jamaica
Japan
Kazakhstan
Republic of Korea (South Korea)
Kosovo
Kuwait
Kyrgyzstan
Latvia
Liechtenstein
Lithuania
Luxembourg
Macedonia
Malaysia
Malta
Mexico
Moldova
Mongolia
Montenegro
Morocco
Netherlands
New Zealand
Norway
Oman
Pakistan
Peru
Philippines
Poland
Portugal
Qatar
Romania
Russia
Serbia
Singapore
Slovak Republic
Slovenia
South Africa
Spain
Sri Lanka
Sweden
Taiwan
Tajikistan
Thailand
Trinidad and Tobago
Tunisia
Turkey
Turkmenistan
Ukraine
United Arab Emirates
United Kingdom
United States of America
Uruguay
Uzbekistan
Venezuela
Vietnam
Zambia

The tax treaty with Bahrain is not applicable to the healthcare industry. Tax treaty negotiations are underway, or have been conducted, with Bahrain, Bosnia and Herzegovina, Brazil, Costa Rica, Ethiopia, Libya, North Korea, Saudi Arabia, Senegal, Syria and Zimbabwe. Tax treaty negotiations between Switzerland and some of the countries listed in the immediately preceding sentence have been ongoing for an extended period of time, and we are not certain when or if such negotiations will be completed, and when or if the corresponding treaties will come into effect.

A Non-Resident Holder of shares or ADRs will not be liable for any Swiss taxes other than the Withholding Tax described above and, if the transfer occurs through or with a Swiss bank or other Swiss securities dealer, the Stamp Duty described below. If, however, the shares or ADRs of Non-Resident Holders can be attributed to a permanent establishment or a fixed place of business maintained by such person within Switzerland during the relevant tax year, the shares or ADRs may be subject to Swiss income taxes in respect of income and gains realized on the shares or ADRs, and such person may qualify for a full refund of the Withholding Tax based on Swiss tax law.

Residents of the US. A Non-Resident Holder who is a resident of the US for purposes of the Treaty is eligible for a reduced rate of tax on dividends equal to 15% of the dividend, provided that such holder (i) qualifies for benefits under the Treaty, (ii) is not a company (or, if it is a company, such company directly holds less than 10% of our voting stock), and (iii) does not conduct business through a permanent establishment or fixed base in Switzerland to which the shares or ADRs are attributable. Such an eligible holder must apply for a refund of the amount of the Withholding Tax in excess of the 15% Treaty rate. A Non-Resident Holder who is a resident of the US for purposes of the Treaty is eligible for a reduced rate of tax on dividends equal to 5% of the dividend, provided that such holder (i) is a company, (ii) qualifies for benefits under the Treaty, (iii) holds directly at least 10% of our voting stock, and (iv) does not conduct business through a permanent establishment or fixed place of business in Switzerland to which the shares or ADRs are attributable. Such an eligible holder must apply for a

refund of the amount of the Withholding Tax in excess of the 5% Treaty rate. Claims for refunds must be filed on Swiss Tax Form 82 (82C for corporations; 82I for individuals; 82E for other entities), which may be obtained from any Swiss Consulate General in the US or from the Federal Tax Administration of Switzerland at the address below, together with an instruction form. Four copies of the form must be duly completed, signed before a notary public of the US, and sent to the Federal Tax Administration of Switzerland, Eigerstrasse 65, CH-3003 Bern, Switzerland. The form must be accompanied by suitable evidence of deduction of Swiss tax withheld at source, such as certificates of deduction, signed bank vouchers or credit slips. The form may be filed on or after July 1 or January 1 following the date the dividend was payable, but no later than December 31 of the third year following the calendar year in which the dividend became payable. For US resident holders of ADRs, JPMorgan Chase Bank, N.A., as depositary, will comply with these Swiss procedures on behalf of the holders, and will remit the net amount to the holders.

Stamp Duty upon transfer of securities. The sale of shares, whether by Swiss residents or Non-Resident Holders, may be subject to federal securities transfer Stamp Duty of 0.15%, calculated on the sale proceeds, if the sale occurs through or with a Swiss bank or other Swiss securities dealer, as defined in the Swiss Federal Stamp Duty Act. The Stamp Duty has to be paid by the securities dealer and may be charged to the parties in a taxable transaction who are not securities dealers. Stamp Duty may also be due if a sale of shares occurs with or through a non-Swiss bank or securities dealer, provided (i) such bank or dealer is a member of the SIX, and (ii) the sale takes place on the SIX. In addition to this Stamp Duty, the sale of shares by or through a member of the SIX may be subject to a minor stock exchange levy.

US federal income taxation

The following is a general discussion of the material US federal income tax consequences of the ownership and disposition of our shares or ADRs that may be relevant to you if you are a US Holder (as defined below). Because this discussion does not consider any specific circumstances of any particular holder of our shares or ADRs, persons who are subject to US taxation are strongly urged to consult their own tax advisors as to the overall US federal, state and local tax consequences, as well as to the overall Swiss and other foreign tax consequences, of the ownership and disposition of our shares or ADRs. In particular, additional or different rules may apply to US expatriates; banks and other financial institutions; regulated investment companies; traders in securities who elect to apply a mark-to-market method of accounting; dealers in securities or currencies; tax-exempt entities; insurance companies; broker-dealers; investors liable for alternative minimum tax; investors that hold shares or ADRs as part of a straddle, hedging or conversion transaction; holders whose functional currency is not the US dollar; partnerships or other pass-through entities; persons who acquired our shares pursuant to the exercise of employee stock options or otherwise as compensation; and persons who hold, directly, indirectly or by attribution, 10% or more of our outstanding shares. This discussion generally applies only to US Holders who hold the shares or ADRs as a capital asset (generally, for investment purposes), and whose functional currency is the US dollar. Investors are urged to consult their own tax advisors concerning whether they are eligible for benefits under the Treaty.

For purposes of this discussion, a US Holder is a beneficial owner of our shares or ADRs who is (i) an individual who is a citizen or resident of the US for US federal income tax purposes; (ii) a corporation (or other entity taxable as a corporation for US federal income tax purposes) created or organized in or under the laws of the US or a state thereof or the District of Columbia; (iii) an estate the income of which is subject to US federal income taxation regardless of its source; or (iv) a trust (i) subject to the primary supervision of a US court and the control of one or more US persons, or (ii) that has a valid election in place to be treated as a US person. If a partnership (or other entity treated as a partnership for US federal income tax purposes) holds shares or ADRs, the tax treatment of a partner generally will depend upon the status of the partner and the activities of the partnership. Partners in a partnership that holds shares or ADRs are urged to consult their own tax advisor regarding the specific tax consequences of the owning and disposing of such shares or ADRs by the partnership.

For US federal income tax purposes, a US Holder of ADRs generally will be treated as the beneficial owner of our shares represented by the ADRs. However, see the discussion below under "—Dividends" regarding certain statements made by the US Treasury concerning depositary arrangements.

This discussion assumes that each obligation in the Deposit Agreement and any related agreement will be performed in accordance with its terms.

Dividends. US Holders will be required to include in gross income, as an item of ordinary income, the full amount (without reduction for any Withholding Tax) of the dividend paid with respect to our shares or ADRs at the time that such dividend is received by the US Holder, in the case of shares, or by the depositary, in the case of ADRs. For this purpose, a "dividend" will include any distribution paid by us with respect to our shares or ADRs (other than certain pro rata distributions of our capital stock) paid out of our current or accumulated earnings and profits, as determined under US federal income tax principles. To the extent the amount of a distribution by us exceeds our current and accumulated earnings and profits, such excess will first be treated as a tax-free return of capital to the extent of a US Holder's tax basis in the shares or ADRs (with a corresponding reduction in such tax basis), and thereafter will be treated as capital gain, which will be long-term capital gain if the US Holder held our shares or ADRs for more than one year. Under the Code, dividend payments by us on the shares or ADRs are not eligible for the dividends received deduction generally allowed to corporate shareholders.

Dividend income in respect of our shares or ADRs will constitute income from sources outside the US for US foreign tax credit purposes. Subject to the limitations

and conditions provided in the Code, US Holders generally may claim as a credit against their US federal income tax liability, any Withholding Tax withheld from a dividend. The rules governing the foreign tax credit are complex. Each US Holder is urged to consult its own tax advisor concerning whether, and to what extent, a foreign tax credit will be available with respect to dividends received from us. Alternatively, a US Holder may claim the Withholding Tax as a deduction for the taxable year within which the Withholding Tax is paid or accrued, provided a deduction is claimed for all of the foreign income taxes the US Holder pays or accrues in the particular year. A deduction does not reduce US tax on a dollar-for-dollar basis like a tax credit. The deduction, however, is not subject to the limitations applicable to foreign tax credits, but may be subject to other limitations, and each US Holder is urged to consult its own tax advisor.

The US Treasury has expressed concern that parties to whom ADRs are released may be taking actions inconsistent with the claiming of foreign tax credits for US Holders of ADRs. Accordingly, the summary above of the creditability of the Withholding Tax could be affected by future actions that may be taken by the US Treasury.

In general, a US Holder will be required to determine the amount of any dividend paid in Swiss francs, including the amount of any Withholding Tax imposed thereon, by translating the Swiss francs into US dollars at the spot rate on the date the dividend is actually or constructively received by a US Holder, in the case of shares, or by the depositary, in the case of ADRs, regardless of whether the Swiss francs are in fact converted into US dollars. If a US Holder converts the Swiss francs so received into US dollars on the date of receipt, the US Holder generally should not recognize foreign currency gain or loss on such conversion. If a US Holder does not convert the Swiss francs so received into US dollars on the date of receipt, the US Holder will have a tax basis in the Swiss francs equal to the US dollar value on such date. Any foreign currency gain or loss that a US Holder recognizes on a subsequent conversion or other disposition of the Swiss francs generally will be treated as US source ordinary income or loss.

For a non-corporate US Holder, the US dollar amount of any dividends paid that constitute qualified dividend income generally will be taxable at a maximum rate of 15% (or 20% in the case of taxpayers with annual income that exceeds certain thresholds), provided that the US Holder meets certain holding period and other requirements. In addition, the dividends could be subject to a 3.8% net investment income tax. This tax is applied against the lesser of the US Holder's net investment income or the amount by which modified adjusted gross income exceeds a statutory threshold amount based on filing status. We currently believe that dividends paid with respect to our shares and ADRs will constitute qualified dividend income for US federal income tax purposes, provided that the US Holder meets certain holding period and other requirements. US Holders of shares or ADRs are urged to consult their own tax advisors regarding the availability to them of the reduced dividend rate in light of their own particular situation and the computations of their foreign tax credit limitation with respect to any qualified dividends paid to them, as applicable.

Sale or other taxable disposition. Upon a sale or other taxable disposition of shares or ADRs, US Holders generally will recognize capital gain or loss in an amount equal to the difference between the US dollar value of the amount realized on the disposition and the US Holder's tax basis (determined in US dollars) in the shares or ADRs. This capital gain or loss generally will be US source gain or loss and will be treated as long-term capital gain or loss if the holding period in the shares or ADRs exceeds one year. In the case of a non-corporate US Holder, any long-term capital gain generally will be subject to US federal income tax at preferential rates, with a maximum rate of 15% (or 20% in the case of taxpayers with annual income that exceeds certain thresholds). In addition, the gains could be subject to a 3.8% investment income tax. This tax is applied against the lesser of the US Holder's net investment income or the amount by which modified adjusted gross income exceeds a statutory threshold amount based on filing status. The deductibility of capital losses is subject to significant limitations under the Code. Deposits or withdrawals of our shares by US Holders in exchanges for ADRs will not result in the realization of gain or loss for US federal income tax purposes.

US information reporting and backup withholding. Dividend payments with respect to shares or ADRs and proceeds from the sale, exchange or other disposition of shares or ADRs received in the United States or through US-related financial intermediaries may be subject to information reporting to the US Internal Revenue Service (IRS) and possible US backup withholding. Certain exempt recipients (such as corporations) are not subject to these information reporting and backup withholding requirements. Backup withholding will not apply to a US Holder who furnishes a correct taxpayer identification number and makes any other required certification or who is otherwise exempt from backup withholding. Any US Holders required to establish their exempt status generally must provide a properly executed IRS Form W-9 (Request for Taxpayer Identification Number and Certification). Backup withholding is not an additional tax. Amounts withheld as backup withholding may be credited against a US Holder's US federal income tax liability, and a US Holder may obtain a refund of any excess amounts withheld under the backup withholding rules by timely filing the appropriate claim for refund with the IRS and furnishing any required information.

10.F Dividends and paying agents

Not applicable.

10.G Statement by experts

Not applicable.

10.H Documents on display

Any statement in this Form 20-F about any of our contracts or other documents is not necessarily complete. If the contract or document is filed as an exhibit to the Form 20-F, the contract or document is deemed to modify the description contained in this Form 20-F. You must review the exhibits themselves for a complete description of the contract or document.

The SEC maintains an internet site at http://www.sec.gov that contains reports and other information regarding issuers that file electronically with the SEC. These SEC filings are also available to the public from commercial document retrieval services.

We are required to file or furnish reports and other information with the SEC under the Exchange Act and regulations under that act. As a foreign private issuer, we are exempt from the rules under the Exchange Act prescribing the form and content of proxy statements, and our officers, directors and principal shareholders are exempt from the reporting and short swing profit recovery provisions contained in Section 16 of the Exchange Act.

10.I Subsidiary information

Not applicable.

Item 11. Quantitative and Qualitative Disclosures About Market Risk

The major financial risks facing the Group are managed centrally by Group Treasury. We have a written Treasury Directive and have implemented a strict segregation of front-office and back-office controls. The Group does regular reconciliations of its positions with its counterparties. In addition, the Treasury function is included in management's internal control assessment.

For information about the effects of currency fluctuations and how we manage currency risk, see "Item 5. Operating and Financial Review and Prospects—Item 5.B Liquidity and capital resources."

The information set forth under "Item 18. Financial Statements—Note 29. Financial instruments—additional disclosures" is incorporated by reference.

Item 12. Description of Securities Other Than Equity Securities

12.A Debt securities

Not applicable.

12.B Warrants and rights

Not applicable.

12.C Other securities

Not applicable.

12.D American Depositary Shares

Fees payable by ADR holders

According to our Deposit Agreement with the ADS depositary, JPMorgan Chase Bank, N.A. (JPMorgan), holders of our ADRs may have to pay to JPMorgan, either directly or indirectly, fees or charges up to the amounts set forth below:

Category	Depositary actions	Associated fee
Depositing or substituting underlying shares	Acceptance of shares surrendered, and issuance of ADRs in exchange, including surrenders and issuances in respect of: — Share distributions — Stock split — Rights — Merger — Exchange of shares or any other transaction or event or other distribution affecting the ADSs or the deposited shares	USD 5.00 for each 100 ADSs (or portion thereof) evidenced by the new ADRs delivered
Withdrawing underlying shares	Acceptance of ADRs surrendered for withdrawal of deposited shares	USD 5.00 for each 100 ADSs (or portion thereof) evidenced by the ADRs surrendered
Selling or exercising rights	Distribution or sale of shares, the fee being in an amount equal to the fee for the execution and delivery of ADRs that would have been charged as a result of the deposit of such shares	USD 5.00 for each 100 ADSs (or portion thereof)
Transferring, splitting or grouping receipts	Transfers, combining or grouping of depositary receipts	USD 1.50 per ADR
Expenses of the depositary	Expenses incurred on behalf of holders in connection with: — Compliance with foreign exchange control regulations or any law or regulation relating to foreign investment — The depositary's or its custodian's compliance with applicable law, rule or regulation — Stock transfer or other taxes and other governmental charges — Cable, telex and facsimile transmission and delivery — Expenses of the depositary in connection with the conversion of foreign currency into US dollars (which are paid out of such foreign currency) — Any other charge payable by any of the depositary or its agents	Expenses payable at the sole discretion of the depositary by billing holders or by deducting charges from one or more cash dividends or other cash distributions
Advance tax relief	Tax relief/reclamation process for qualified holders	A depositary service charge of USD 0.008 per ADS

Fees payable by the depositary to the issuer

Pursuant to an agreement effective as of May 11, 2017 ("the Agreement"), JPMorgan, as our ADS depositary, has agreed to make an annual contribution payment to Novartis at the end of each 12-month period beginning on the effective date of the Agreement and on each subsequent anniversary of the effective date of the Agreement (each such 12-month period is a "Contract Year"). This annual contribution payment will equal: (a)(1) USD 1.7 million less (a)(2) the custody costs, fees and expenses (including, without limitation, any central securities depository fees, charges and expenses) incurred during the applicable Contract Year (the items in (a)(2) collectively are the "Custody Costs") plus (b) 70% of the gross issuance and cancellation fees collected by JPMorgan under the Deposit Agreement during such Contract Year minus (c) that portion (if any) of JPMorgan's legal fees, charges and out-of-pocket expenses in excess of USD 50 000 for such Contract Year. To the extent that the Custody Costs for a Contract Year exceed USD 1.7 million, these costs would be capped at USD 1.7 million.

JPMorgan has further agreed to waive the USD 0.05 per ADS issuance fees that would normally be owed by Novartis in connection with our deposits of shares as part of our employee stock ownership and employee participation plans. Novartis is responsible for reimbursing JPMorgan for all taxes and governmental charges required to have been withheld and/or paid, and not so withheld and/or paid, arising from such waived fees.

PART II

Item 13. Defaults, Dividend Arrearages and Delinquencies

None.

Item 14. Material Modifications to the Rights of Security Holders and Use of Proceeds

None.

Item 15. Controls and Procedures

Report of Novartis Management on Internal Control Over Financial Reporting

Novartis AG's Chief Executive Officer and Chief Financial Officer, after evaluating the effectiveness of our disclosure controls and procedures (as defined in Exchange Act Rule 13a-15(e)) as of the end of the period covered by this Annual Report, have concluded that, as of such date, our disclosure controls and procedures were effective.

The Board of Directors and management of the Group are responsible for establishing and maintaining adequate internal control over financial reporting. The Group's internal control system was designed to provide reasonable assurance to the Group's management and Board of Directors regarding the reliability of financial reporting and the preparation and fair presentation of its published consolidated financial statements.

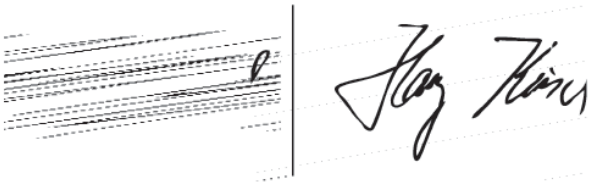
All internal control systems, no matter how well designed, have inherent limitations. Therefore, even those systems determined to be effective may not prevent or detect misstatements and can provide only reasonable assurance with respect to financial statement preparation and presentation. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Group management assessed the effectiveness of the Group's internal control over financial reporting as of December 31, 2020. In making this assessment, it used the criteria established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on our assessment, management concluded that, as of December 31, 2020, the Group's internal control over financial reporting is effective based on those criteria.

PricewaterhouseCoopers AG, Switzerland, an independent registered public accounting firm, has issued an unqualified opinion on the effectiveness of the Group's internal control over financial reporting, which is included in this Annual Report under "Item 18. Financial Statements—Report of independent registered public accounting firm."

See the report of PwC, an independent registered public accounting firm, included under "Item 18. Financial Statements—Report of independent registered public accounting firm."

There were no changes to our internal control over financial reporting that occurred during the period covered by this Annual Report that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.



Vas Narasimhan
Chief Executive Officer

Harry Kirsch
Chief Financial Officer

Basel, January 25, 2021

Item 16A. Audit Committee Financial Expert

Our Audit and Compliance Committee has determined that Srikant Datar and Elizabeth Doherty each possess specific accounting and financial management expertise and that each is an Audit Committee Financial Expert as defined by the SEC. The Board of Directors has also determined that Srikant Datar and Elizabeth Doherty are each "independent" in accordance with the applicable requirements of Rule 10A-3 of the Exchange Act, and that other members of the Audit and Compliance Committee have sufficient experience and ability in finance and compliance matters to enable them to adequately discharge their responsibilities.

Item 16B. Code of Ethics

In addition to our Code of Ethics and Professional Practices Policy, which are applicable to all of our associates, we have adopted Ethical Conduct Requirements that impose additional obligations on our principal executive officer, principal financial officer, principal accounting officer, and persons performing similar functions. This document is accessible on our internet website at: https://www.novartis.com/investors/company-overview/corporate-governance

Item 16C. Principal Accountant Fees and Services

The information set forth under “Item 6. Directors, Senior Management and Employees—Item 6.C Board practices—Corporate governance—Auditors” is incorporated by reference.

Item 16D. Exemptions from the Listing Standards for Audit Committees

Not applicable.

Item 16E. Purchases of Equity Securities by the Issuer and Affiliated Purchasers

2020	Total number of shares purchased (a)[1]	Average price paid per share in USD (b)	Total number of shares purchased as part of publicly announced plans or programs (c)[2]	Maximum approximate value of shares that may yet be purchased under the plans or programs (CHF millions) (d)	Maximum approximate value of shares that may yet be purchased under the plans or programs (USD millions) (e)[3]
Jan. 1-31	1 127 034	95.09	0	4 752	4 897
Feb. 1-28	315 761	95.18	0	4 752	4 913
Mar. 1-31	28 093	89.61	0	4 752	4 937
Apr. 1-30	67 831	83.63	0	4 752	4 881
May 1-31	7 990	85.29	0	4 752	4 932
Jun. 1-30	22 601	86.85	0	4 752	4 989
Jul. 1-31	13 275	87.91	0	4 752	5 245
Aug. 1-31	1 806 646	87.15	1 800 000	4 610	5 102
Sep. 1-30	12 951 800	88.85	12 917 162	3 559	3 862
Oct. 1-31	9 896 929	87.06	9 882 838	2 774	3 032
Nov. 1-30	1 350 036	89.71	1 340 000	2 665	2 953
Dec. 1-31	6 715 051	91.22	6 700 000	2 122	2 409
Total	**34 303 047**	**88.99**	**32 640 000**		

[1] Column (a) shows shares repurchased on the SIX Swiss Exchange second trading line plus shares we purchased from employees who had obtained the shares through a Novartis Employee Ownership Plan. See "Item 18. Financial Statements – Note 26 Equity-based participation plans for associates."
[2] Column (c) shows shares repurchased on the SIX Swiss Exchange second trading line under the eighth CHF 10 billion share buyback authority approved at the 2019 AGM. See "Item 6. Directors, Senior Management and Employees – Item 6C. Board Practices – Our capital structure – Changes in capital."
[3] Column (e) shows the Swiss franc amount from column (d) converted into US dollars as of the month-end, using the Swiss franc/US dollar exchange rate at the applicable month-end

Item 16F. Change in Registrant's Certifying Accountant

Not applicable.

Item 16G. Corporate Governance

Novartis AG is subject to and compliant with the laws and regulations of Switzerland (in particular, Swiss company and securities laws, SIX Swiss Exchange rules and the Swiss Code of Best Practice for Corporate Governance) and the securities laws of the United States, including New York Stock Exchange (NYSE) rules, as applicable to foreign private issuers of securities. The following summarizes some significant ways in which our corporate governance practices differ from those followed by domestic listed US companies under the listing standards of the NYSE:

- Novartis AG shareholders do not receive written reports directly from Board committees.
- External auditors are appointed by shareholders at the Annual General Meeting of Shareholders (AGM), as opposed to being appointed by the Audit and Compliance Committee.
- While shareholders cannot vote on all equity compensation plans, they are entitled to hold separate, yearly binding votes on Board and Executive Committee compensation.
- The Board has set up a separate Risk Committee that oversees the risk management system and processes, as opposed to delegating this responsibility to the Audit and Compliance Committee.
- The full Board is responsible for overseeing the performance evaluation of the Board and Executive Committee.
- The full Board is responsible for setting objectives relevant to the CEO's compensation and for evaluating his performance.

Item 16H. Mine Safety Disclosure

Not applicable.

PART III

Item 17. Financial Statements

See response to “Item 18. Financial Statements.”

Item 18. Financial Statements

The following financial statements are filed as part of this Annual Report.

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Item 19. Exhibits

The SEC maintains an internet site at http://www.sec.gov that contains reports and other information regarding issuers that file electronically with the SEC. These SEC filings are also available to the public from commercial document retrieval services.

1.1 Articles of Incorporation of Novartis AG, as amended February 28, 2020 (English translation) (incorporated by reference to Exhibit 4.1 to Novartis AG's registration statement on Form S-8 (File No. 333-250207) as filed with the SEC on November 19, 2020).

1.2 Regulations of the Board of Directors, the Board Committees and the Executive Committee of Novartis AG, effective January 1, 2021.

2.1 Amended and Restated Deposit Agreement, dated as of May 11, 2000, among Novartis AG, JPMorgan Chase Bank (fka Morgan Guaranty Trust Company of New York), as depositary, and all holders from time to time of ADRs issued thereunder (incorporated by reference to Exhibit (a)(1) to Post-Effective Amendment No. 1 to Novartis AG's registration statement on Form F-6 (File No. 333-11758) as filed with the SEC on September 8, 2000).

2.2 Amendment No. 1 to the Amended and Restated Deposit Agreement (incorporated by reference to Exhibit (a)(2) to Post-Effective Amendment No. 1 to Novartis AG's registration statement on Form F-6 (File No. 333-11758) as filed with the SEC on September 8, 2000).

2.3 Amendment No. 2 to the Amended and Restated Deposit Agreement (incorporated by reference to Exhibit (a)(3) to Novartis AG's registration statement on Form F-6 (File No. 333-13446) as filed with the SEC on May 3, 2001).

2.4 Restricted Issuance Agreement, dated as of January 11, 2002, among Novartis AG, JPMorgan Chase Bank, as depositary, and all holders from time to time of ADRs representing ADSs issued thereunder (incorporated by reference to Exhibit 4 to the Registration Statement on Form F-3 (File No. 333-81862) as filed with the SEC on January 31, 2002).

2.5 Letter Agreement, dated December 14, 2007, between Novartis AG and JPMorgan Chase Bank, as depositary (incorporated by reference to Exhibit 2.4 to the Form 20-F for the year ended December 31, 2007, as filed with the SEC on January 28, 2008).

2.6 Form of American Depositary Receipt (incorporated by reference to Exhibit (a)(7) to the Registration Statement on Form F-6 (File No. 333-198623) as filed with the SEC on September 8, 2014).

2.7 The total amount of long-term debt securities authorized under any instrument does not exceed 10% of the total assets of the Company and its subsidiaries on a consolidated basis. We hereby agree to furnish to the SEC, upon its request, a copy of any instrument defining the rights of holders of long-term debt of the Company or of its subsidiaries for which consolidated or unconsolidated financial statements are required to be filed.

2.8 Description of Securities registered under Section 12 of the Exchange Act.

8.1 For a list of all of our principal Group subsidiaries and associated companies, see "Item 18. Financial Statements—Note 32. Principal Group subsidiaries and associated companies."

12.1 Certification of Vasant Narasimhan, Chief Executive Officer of Novartis AG, pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.

12.2 Certification of Harry Kirsch, Chief Financial Officer of Novartis AG, pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.

13.1 Certification of Vasant Narasimhan, Chief Executive Officer of Novartis AG, pursuant to Section 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.

13.2	Certification of Harry Kirsch, Chief Financial Officer of Novartis AG, pursuant to Section 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
15.1	Consent of PricewaterhouseCoopers AG.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

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Novartis Group consolidated financial statements

Consolidated income statements

(For the years ended December 31, 2020, 2019 and 2018)

(USD millions unless indicated otherwise)	Note	2020	2019	2018
Net sales to third parties from continuing operations	3	**48 659**	**47 445**	**44 751**
Sales to discontinued segment			53	82
Net sales from continuing operations		**48 659**	**47 498**	**44 833**
Other revenues	3	1 239	1 179	1 266
Cost of goods sold		– 15 121	– 14 425	– 14 510
Gross profit from continuing operations		**34 777**	**34 252**	**31 589**
Selling, general and administration		– 14 197	– 14 369	– 13 717
Research and development		– 8 980	– 9 402	– 8 489
Other income		1 742	2 031	1 629
Other expense		– 3 190	– 3 426	– 2 609
Operating income from continuing operations		**10 152**	**9 086**	**8 403**
Income from associated companies	4	673	659	6 438
Interest expense	5	– 869	– 850	– 932
Other financial income and expense	5	– 78	45	186
Income before taxes from continuing operations		**9 878**	**8 940**	**14 095**
Taxes	6	– 1 807	– 1 793	– 1 295
Net income from continuing operations		**8 071**	**7 147**	**12 800**
Net loss from discontinued operations before gain on distribution of Alcon Inc. to Novartis AG shareholders	30		– 101	– 186
Gain on distribution of Alcon Inc. to Novartis AG shareholders	2		4 691	
Net income/(loss) from discontinued operations	30		**4 590**	**– 186**
Net income		**8 071**	**11 737**	**12 614**
Attributable to:				
Shareholders of Novartis AG		*8 072*	*11 732*	*12 611*
Non-controlling interests		*– 1*	*5*	*3*
Basic earnings per share (USD) from continuing operations		3.55	3.12	5.52
Basic earnings per share (USD) from discontinued operations			2.00	– 0.08
Total basic earnings per share (USD)	7	**3.55**	**5.12**	**5.44**
Diluted earnings per share (USD) from continuing operations		3.52	3.08	5.46
Diluted earnings per share (USD) from discontinued operations			1.98	– 0.08
Total diluted earnings per share (USD)	7	**3.52**	**5.06**	**5.38**

The accompanying Notes form an integral part of the consolidated financial statements.

Consolidated statements of comprehensive income

(For the years ended December 31, 2020, 2019 and 2018)

(USD millions)	Note	**2020**	2019	2018
Net income		**8 071**	**11 737**	**12 614**
Other comprehensive income to be eventually recycled into the consolidated income statement:				
Fair value adjustments on debt securities, net of taxes	8		1	
Fair value adjustments on deferred cash flow hedges, net of taxes	8		1	12
Total fair value adjustments on financial instruments, net of taxes			2	12
Novartis share of other comprehensive income recognized by associated companies, net of taxes	4	– 56	– 94	– 482
Net investment hedge	8	– 201	44	95
Currency translation effects	8	3 194	352	315
Total of items to eventually recycle		2 937	304	– 60
Other comprehensive income never to be recycled into the consolidated income statement:				
Actuarial gains/(losses) from defined benefit plans, net of taxes	8	143	– 467	– 359
Fair value adjustments on equity securities, net of taxes	8	250	– 47	13
Total of items never to be recycled		393	– 514	– 346
Total comprehensive income		**11 401**	**11 527**	**12 208**
Attributable to:				
Shareholders of Novartis AG		*11 403*	*11 525*	*12 210*
Continuing operations		*11 403*	*6 948*	*12 417*
Discontinued operations			*4 577*	*– 207*
Non-controlling interests		*– 2*	*2*	*– 2*

The accompanying Notes form an integral part of the consolidated financial statements.

Consolidated balance sheets

(At December 31, 2020 and 2019)

(USD millions)	Note	2020	2019
Assets			
Non-current assets			
Property, plant and equipment	9	12 263	12 069
Right-of-use assets	10	1 676	1 677
Goodwill	11	29 999	26 524
Intangible assets other than goodwill	11	36 809	28 787
Investments in associated companies	4	9 632	8 644
Deferred tax assets	12	8 214	7 909
Financial assets	13	2 901	2 518
Other non-current assets	13	892	738
Total non-current assets		**102 386**	**88 866**
Current assets			
Inventories	14	7 131	5 982
Trade receivables	15	8 217	8 301
Income tax receivables		239	254
Marketable securities, commodities, time deposits and derivative financial instruments	16	1 905	334
Cash and cash equivalents	16	9 658	11 112
Other current assets	17	2 523	2 680
Total current assets without disposal group		**29 673**	**28 663**
Assets of disposal group held for sale	2		841
Total current assets		**29 673**	**29 504**
Total assets		**132 059**	**118 370**
Equity and liabilities			
Equity			
Share capital	18	913	936
Treasury shares	18	– 53	– 80
Reserves		55 738	54 618
Equity attributable to Novartis AG shareholders		**56 598**	**55 474**
Non-controlling interests		68	77
Total equity		**56 666**	**55 551**
Liabilities			
Non-current liabilities			
Financial debts	19	26 259	20 353
Lease liabilities	10	1 719	1 703
Deferred tax liabilities	12	7 422	5 867
Provisions and other non-current liabilities	20	6 934	6 632
Total non-current liabilities		**42 334**	**34 555**
Current liabilities			
Trade payables		5 403	5 424
Financial debts and derivative financial instruments	21	9 785	7 031
Lease liabilities	10	286	246
Current income tax liabilities		2 458	2 194
Provisions and other current liabilities	22	15 127	13 338
Total current liabilities without disposal group		**33 059**	**28 233**
Liabilities of disposal group held for sale	2		31
Total current liabilities		**33 059**	**28 264**
Total liabilities		**75 393**	**62 819**
Total equity and liabilities		**132 059**	**118 370**

The accompanying Notes form an integral part of the consolidated financial statements.

Consolidated statements of changes in equity

(For the years ended December 31, 2020, 2019 and 2018)

(USD millions)	Note	Share capital	Treasury shares	Reserves: Retained earnings	Reserves: Total value adjustments	Equity attributable to Novartis shareholders	Non-controlling interests	Total equity
Total equity at December 31, 2017, as previously reported		**969**	**– 100**	**77 639**	**– 4 340**	**74 168**	**59**	**74 227**
Impact of change in accounting policies				237	– 177	60		60
Restated equity at January 1, 2018		**969**	**– 100**	**77 876**	**– 4 517**	**74 228**	**59**	**74 287**
Net income				12 611		12 611	3	12 614
Other comprehensive income	8			– 482	81	– 401	– 5	– 406
Total comprehensive income				**12 129**	**81**	**12 210**	**– 2**	**12 208**
Dividends	18.1			– 6 966		– 6 966		– 6 966
Purchase of treasury shares	18.2		– 13	– 1 960		– 1 973		– 1 973
Reduction of share capital	18	– 25	34	– 9				
Exercise of options and employee transactions	18.2		4	430		434		434
Other share sales	18.2		2	261		263		263
Equity-based compensation	18.2		4	752		756		756
Increase of treasury share repurchase obligation under a share buyback trading plan	18.3			– 284		– 284		– 284
Transaction costs, net of taxes	18.8			– 79		– 79		– 79
Fair value adjustments on financial assets sold	8			16	– 16			
Impact of change in ownership of consolidated entities	18.5			– 13		– 13	22	9
Changes in non-controlling interests	18.6						– 1	– 1
Other movements	18.7			38		38		38
Total of other equity movements		**– 25**	**31**	**– 7 814**	**– 16**	**– 7 824**	**21**	**– 7 803**
Total equity at December 31, 2018, as previously reported		**944**	**– 69**	**82 191**	**– 4 452**	**78 614**	**78**	**78 692**
Impact of change in accounting policies				3		3		3
Restated equity at January 1, 2019		**944**	**– 69**	**82 194**	**– 4 452**	**78 617**	**78**	**78 695**
Net income				11 732		11 732	5	11 737
Other comprehensive income	8			– 94	– 113	– 207	– 3	– 210
Total comprehensive income				**11 638**	**– 113**	**11 525**	**2**	**11 527**
Dividends	18.1			– 6 645		– 6 645		– 6 645
Dividend in kind to effect the spin-off of Alcon Inc.	2			– 23 434		– 23 434		– 23 434
Purchase of treasury shares	18.2		– 31	– 5 480		– 5 511		– 5 511
Reduction of share capital	18	– 8	12	– 4				
Exercise of options and employee transactions	18.2		3	207		210		210
Equity-based compensation	18.2		5	828		833		833
Shares delivered to Alcon employees as a result of the Alcon spin-off	18.2			18		18		18
Taxes on treasury share transactions				– 189		– 189		– 189
Decrease of treasury share repurchase obligation under a share buyback trading plan	18.3			284		284		284
Transaction costs, net of taxes	18.8			– 253		– 253		– 253
Fair value adjustments on financial assets sold	8			95	– 95			
Impact of change in ownership of consolidated entities	18.5			– 3		– 3	– 2	– 5
Changes in non-controlling interests	18.6						– 1	– 1
Fair value adjustments related to divestments	8			– 3	3			
Other movements	18.7			22		22		22
Total of other equity movements		**– 8**	**– 11**	**– 34 557**	**– 92**	**– 34 668**	**– 3**	**– 34 671**
Total equity at December 31, 2019		**936**	**– 80**	**59 275**	**– 4 657**	**55 474**	**77**	**55 551**
Net income				8 072		8 072	– 1	8 071
Other comprehensive income	8			– 56	3 387	3 331	– 1	3 330
Total comprehensive income				**8 016**	**3 387**	**11 403**	**– 2**	**11 401**
Dividends	18.1			– 6 987		– 6 987		– 6 987
Purchase of treasury shares	18.2		– 18	– 3 038		– 3 056		– 3 056
Reduction of share capital	18	– 23	31	– 8				
Exercise of options and employee transactions	18.2		8	798		806		806
Repurchase of options	18.4			– 89		– 89		– 89
Equity-based compensation	18.2		6	724		730		730
Shares delivered to Alcon employees as a result of the Alcon spin-off	18.2		0	30		30		30
Taxes on treasury share transactions				32		32		32
Increase of treasury share repurchase obligation under a share buyback trading plan	18.3			– 1 769		– 1 769		– 1 769
Fair value adjustments on financial assets sold	8			150	– 150			
Fair value adjustments related to divestments	8			– 2	2			
Impact of change in ownership of consolidated entities	18.5			7	– 1	6	– 7	– 1
Other movements	18.7			18		18		18
Total of other equity movements		**– 23**	**27**	**– 10 134**	**– 149**	**– 10 279**	**– 7**	**– 10 286**
Total equity at December 31, 2020		**913**	**– 53**	**57 157**	**– 1 419**	**56 598**	**68**	**56 666**

The accompanying Notes form an integral part of the consolidated financial statements.

Consolidated statements of cash flows

(For the years ended December 31, 2020, 2019 and 2018)

(USD millions)	Note	2020	2019	2018
Net income from continuing operations		**8 071**	**7 147**	**12 800**
Adjustments to reconcile net income from continuing operations to net cash flows from operating activities from continuing operations				
Reversal of non-cash items and other adjustments	23.1	9 881	9 122	1 486
Dividends received from associated companies and others		490	463	719
Interest received		47	214	241
Interest paid		– 703	– 793	– 816
Other financial receipts		464	28	218
Other financial payments		– 39	– 33	– 31
Taxes paid	23.2	– 1 833	– 1 876	– 1 506
Net cash flows from operating activities from continuing operations before working capital and provision changes		**16 378**	**14 272**	**13 111**
Payments out of provisions and other net cash movements in non-current liabilities		– 2 437	– 924	– 638
Change in net current assets and other operating cash flow items	23.3	– 291	199	576
Net cash flows from operating activities from continuing operations		**13 650**	**13 547**	**13 049**
Net cash flows from operating activities from discontinued operations			78	1 223
Total net cash flows from operating activities		**13 650**	**13 625**	**14 272**
Purchases of property, plant and equipment		– 1 275	– 1 379	– 1 254
Proceeds from sale of property, plant and equipment		88	857	102
Purchases of intangible assets		– 1 310	– 878	– 1 394
Proceeds from sale of intangible assets		380	973	823
Purchases of financial assets		– 230	– 302	– 205
Proceeds from sale of financial assets		723	1 152	165
Purchases of other non-current assets		– 61	– 60	– 39
Proceeds from sale of other non-current assets		2	3	9
Acquisitions and divestments of interests in associated companies, net	23.4	– 7	– 6	12 854
Acquisitions and divestments of businesses, net	23.5	– 9 957	– 3 760	– 13 683
Purchases of marketable securities and commodities		– 1 900	– 228	– 2 440
Proceeds from sale of marketable securities and commodities		492	2 561	472
Net cash flows used in investing activities from continuing operations		**– 13 055**	**– 1 067**	**– 4 590**
Net cash flows used in investing activities from discontinued operations	30	– 127	– 1 159	– 1 001
Total net cash flows used in investing activities		**– 13 182**	**– 2 226**	**– 5 591**
Dividends paid to shareholders of Novartis AG		– 6 987	– 6 645	– 6 966
Acquisitions of treasury shares		– 2 842	– 5 533	– 2 036
Proceeds from exercised options and other treasury share transactions, net		748	201	700
Increase in non-current financial debts	23.6	7 126	93	2 856
Repayments of non-current financial debts	23.6	– 2 003	– 3 195	– 366
Change in current financial debts	23.6	2 261	– 1 582	1 687
Payments of lease liabilities, net	23.6	– 312	– 273	
Impact of change in ownership of consolidated entities		– 2	– 6	– 19
Other financing cash flows, net		– 147	56	67
Net cash flows used in financing activities from continuing operations		**– 2 158**	**– 16 884**	**– 4 077**
Net cash flows used in/from financing activities from discontinued operations	30	– 50	3 257	– 167
Total net cash flows used in financing activities		**– 2 208**	**– 13 627**	**– 4 244**
Net change in cash and cash equivalents before effect of exchange rate changes		**– 1 740**	**– 2 228**	**4 437**
Effect of exchange rate changes on cash and cash equivalents		286	69	– 26
Total net change in cash and cash equivalents		**– 1 454**	**– 2 159**	**4 411**
Cash and cash equivalents at January 1		11 112	13 271	8 860
Cash and cash equivalents at December 31		**9 658**	**11 112**	**13 271**

The accompanying Notes form an integral part of the consolidated financial statements.

Notes to the Novartis Group consolidated financial statements

1. Significant accounting policies

The Novartis Group (Novartis or Group) is a multinational group of companies specializing in the research, development, manufacturing and marketing of a broad range of innovative pharmaceuticals and cost-saving generic medicines. The Group is headquartered in Basel, Switzerland.

The consolidated financial statements of the Group are prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB). They are prepared in accordance with the historical cost convention, except for items that are required to be accounted for at fair value.

The Group's financial year-end is December 31, which is also the annual closing date of the individual entities' financial statements incorporated into the Group's consolidated financial statements.

The preparation of financial statements requires management to make certain estimates and assumptions, either at the balance sheet date or during the year, which affect the reported amounts of revenues, expenses, assets, liabilities and contingent amounts.

Estimates are based on historical experience and other assumptions that are considered reasonable under the given circumstances and are regularly monitored. Actual outcomes and results could differ from those estimates and assumptions. Revisions to estimates are recognized in the period in which the estimate is revised.

Listed below are accounting policies of significance to Novartis or, in cases where IFRS provides alternatives, the option adopted by Novartis.

Scope of consolidation

The consolidated financial statements include all entities, including structured entities, over which Novartis AG, Basel, Switzerland, directly or indirectly has control (generally as a result of owning more than 50% of the entity's voting interest). Consolidated entities are also referred to as "subsidiaries."

In cases where Novartis does not fully own a subsidiary, it has elected to value any remaining outstanding non-controlling interest at the time of acquiring control of the subsidiary at its proportionate share of the fair value of the net identified assets.

The contribution of a business to an associate or joint venture is accounted for by applying the option under IFRS that permits the accounting for the retained interest of the business contributed at its net book value at the time of the contribution.

Investments in associated companies (generally defined as investments in entities in which Novartis holds between 20% and 50% of voting shares or over which it otherwise has significant influence) and joint ventures are accounted for using the equity method, except for selected venture fund investments for which the Group has elected to apply the method of fair value through the consolidated income statement.

Foreign currencies

The consolidated financial statements of Novartis are presented in US dollars (USD). The functional currency of subsidiaries is generally the local currency of the respective entity. The functional currency used for the reporting of certain Swiss and foreign finance entities is USD instead of their respective local currencies. This reflects the fact that the cash flows and transactions of these entities are primarily denominated in these currencies.

For subsidiaries not operating in hyperinflationary economies, the subsidiary's results, financial position and cash flows that do not have USD as their functional currency are translated into USD using the following exchange rates:

- Income, expense and cash flows using for each month the average exchange rate, with the US dollar values for each month being aggregated during the year
- Balance sheets using year-end exchange rates
- Resulting exchange rate differences are recognized in other comprehensive income

For subsidiaries operating in hyperinflationary economies, the impact of the restatement of the non-monetary assets and liabilities with the general price index at the beginning of the period is recorded in retained earnings in equity. The subsequent gains or losses resulting from the restatement of non-monetary assets are recorded in "Other financial income and expense" in the consolidated income statement.

Non-current assets held for sale or held for distribution to owners

Non-current assets are accounted for as assets held for sale or related to discontinued operations when their carrying amount is to be recovered principally through a sale transaction or distribution to owners and a sale or distribution to owners is considered highly probable. They are stated at the lower of carrying amount and fair value less costs to sell with any resulting impairment recognized. Assets related to discontinued operations and assets of disposal group held for sale are not depreciated or amortized. The prior year consolidated balance sheet is not restated.

If in a subsequent period, the criteria for classification as held for sale are no longer met, the recoverable amount of assets and liabilities are reclassified out of

assets held for sale into the respective balance sheet lines, prior year consolidated balance sheet is not restated. The cumulative amount of depreciation and amortization not recorded since the date of their classification to assets held for sale, and any required adjustments to the recoverable amounts of assets are recognized in the consolidated income statement.

Distribution of Alcon Inc. to Novartis AG shareholders

During the first quarter of 2019, at the Annual General Meeting (AGM) of Novartis AG shareholders, held on February 28, 2019, the Novartis AG shareholders approved a special distribution by way of a dividend in kind to effect the spin-off of Alcon Inc.

The February 28, 2019, shareholder approval for the spin-off required the Alcon Division and selected portions of corporate activities attributable to Alcon's business (the "Alcon business") to be reported as discontinued operations.

The shareholder approval to spin off the Alcon business also required the recognition of a distribution liability at the fair value of the Alcon business. The Group elected to measure the distribution liability at the fair value of the Alcon business net assets taken as a whole. The distribution liability was recognized through a reduction in retained earnings. It was required to be adjusted at each balance sheet date for changes in its estimated fair value, up to the date of the distribution to shareholders through retained earnings. Any resulting impairment of the business assets to be distributed would have been recognized in the consolidated income statements in "Other expense" of discontinued operations, at the date of initial recognition of the distribution liability or at subsequent dates resulting from changes of the distribution liability valuation. At the April 8, 2019 distribution settlement date, the resulting gain, which was measured as the excess amount of the distribution liability over the then-carrying value of the net assets of the business distributed, was recognized on the line "Gain on distribution of Alcon Inc. to Novartis AG shareholders" in the income statement of discontinued operations.

The recognition of the distribution liability required the use of valuation techniques for purposes of impairment testing of the Alcon business' assets to be distributed and for the measurement of the fair value of the distribution liability. These valuations required the use of management assumptions and estimates related to the Alcon business' future cash flows, market multiples to estimate day one market value, and control premiums to apply in estimating the Alcon business fair value. These fair value measurements were classified as "Level 3" in the fair value hierarchy. The section "—Impairment of goodwill and intangible assets" in this Note 1 provides additional information on key assumptions that are highly sensitive in the estimation of fair values using valuation techniques.

Transaction costs that were directly attributable to the distribution (spin-off) of Alcon to the Novartis shareholders, and that would otherwise have been avoided, were recorded as a deduction from equity.

For additional disclosures, refer to "Note 2. Significant transactions—Significant transactions in 2019—Completion of the spin-off of the Alcon business through a dividend in kind distribution to Novartis AG shareholders," and "Note 30. Discontinued operations."

Acquisition of assets and businesses

Assets separately acquired are recorded at cost, which includes the purchase price and any directly attributable costs for bringing the asset into the condition to operate as intended. Expected costs for obligations to dismantle and remove property, plant and equipment when they are no longer used are included in their cost.

Acquired businesses are accounted for using the acquisition method, unless the optional concentration test is applied. The optional concentration test allows for the election on a transaction-by-transaction basis to account for the acquired business as an asset separately acquired when substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets.

The acquisition method requires that the assets acquired and liabilities assumed be recorded at their respective fair values on the date the Group obtains control. The excess of the fair value of the total purchase consideration transferred and the fair value of the acquired assets and assumed liabilities is recognized as goodwill. The related valuations are based on information available at the acquisition date. Acquisition related costs are expensed as incurred.

The application of the acquisition method requires certain estimates and assumptions to be made, especially concerning the fair values of the acquired intangible assets, inventories, property, plant and equipment and the liabilities assumed at the acquisition date, and the useful lives of the intangible assets and property, plant and equipment. Estimates of fair value require the use of valuation techniques. These valuations require the use of management assumptions and estimates, including value of comparable assets in the market, amount and timing of future cash flows, outcomes and costs of research and development activities, probability of obtaining regulatory approval, long-term sales forecasts, actions of competitors, discount rates and terminal growth rates. The section "—Impairment of goodwill and intangible assets" in this Note 1 provides additional information on key assumptions that are highly sensitive in the estimation of fair values using valuation techniques.

Property, plant and equipment

Property, plant and equipment are depreciated on a straight-line basis in the consolidated income statement over their estimated useful lives. Freehold land is not depreciated. The related depreciation expense is included in the costs of the functions using the asset.

Property, plant and equipment are assessed for impairment whenever there is an indication that the balance sheet carrying amount may not be recoverable using cash flow projections for the useful life.

The following table shows the respective useful lives for property, plant and equipment:

	Useful life
Buildings	20 to 40 years
Machinery and other equipment	
Machinery and equipment	7 to 20 years
Furniture and vehicles	5 to 10 years
Computer hardware	3 to 7 years

Government grants obtained for construction activities, including any related equipment, are deducted from the gross acquisition cost to arrive at the balance sheet carrying value of the related assets.

Leases and right-of-use assets

From January 1, 2019, with the adoption of IFRS 16 Leases, the Group adopted the following accounting policies for leases and right-of-use assets:

As lessee, the Group assesses whether a contract contains a lease at inception of a contract and upon the modification of a contract. The Group elected to allocate the consideration in the contract to the lease and non-lease components on the basis of the relative standalone price.

The Group recognizes a right-of-use asset and a corresponding lease liability for all arrangements in which it is a lessee, except for leases with a term of 12 months or less (short-term leases) and low-value leases. For these short-term and low-value leases, the Group recognizes the lease payments as an operating expense on a straight-line basis over the term of the lease.

The lease liability is initially measured at the present value of the future lease payments as from the commencement date of the lease to the end of the lease term. The lease term includes the period of any lease extension that in management's assessment is highly probable to be exercised by the Group. The lease payments are discounted using the interest rate implicit in the lease or, if not readily determinable, the Novartis incremental borrowing rate for the asset subject to the lease in the respective markets.

The Group remeasures the lease liability (and makes a corresponding adjustment to the related right-of-use asset) whenever there is a change to the lease terms or expected payments under the lease, or a modification that is not accounted for as a separate lease.

The portion of the lease payments attributable to the repayment of lease liabilities is recognized in cash flows used in financing activities, and the portion attributable to the payment of interest is included in cash flows from operating activities.

Right-of-use assets are initially recognized on the balance sheet at cost, which comprises the amount of the initial measurement of the corresponding lease liability, adjusted for any lease payments made at or prior to the commencement date of the lease, any lease incentive received and any initial direct costs incurred by Novartis, and expected costs for obligations to dismantle and remove right-of-use assets when they are no longer used.

Right-of-use assets are depreciated on a straight-line basis from the commencement date of the lease over the shorter of the useful life of the right-of-use asset or the end of the lease term.

Right-of-use assets are assessed for impairment whenever there is an indication that the balance sheet carrying amount may not be recoverable using cash flow projections for the useful life.

In arrangements where the Group is the lessor, it determines at lease inception whether the lease is a finance lease or an operating lease. Leases that transfer substantially all of the risk and rewards incidental to ownership of the underlying asset to the counterparty (the lessee) are accounted for as finance leases. Leases that do not transfer substantially all of the risks and rewards of ownership are accounted for as operating leases. Lease payments received under operating leases are recognized on a straight-line basis over the lease term in the consolidated income statement in either "net sales" or "other income," depending on the nature of and underlying asset to the lease arrangement.

Prior to January 1, 2019, the Group applied the following accounting policies for leases:

Leases that transferred substantially all of the risks and rewards of ownership were recognized as finance leases, with the leased asset measured initially at an amount equal to the lower of their fair value and the present value of the minimum lease payments. Minimum lease payments were the payments over the lease term that the Group, as leasee, was required to make, excluding contingent rent. The underlying asset was accounted for in accordance with the accounting policy applicable to that asset.

Leases that did not transfer substantially all of the risks and rewards of ownership were accounted for as operating leases and were not recognized in the consolidated balance sheet. Payments made under operating leases were recognized in the consolidated income statement on a straight-line basis over the term of the lease. Lease incentives received were deferred and recognized as a component of lease expense over the term of the lease. The future undiscounted lease payments under operating leases were disclosed as commitments in the notes to the consolidated financial statements.

Lessor accounting policies were not substantially different from those applied upon the adoption of IFRS 16 Leases, as described above.

The section "—Impact of adopting significant new IFRS standards in 2019" in this Note 1 provides additional disclosures on the impact of adoption of IFRS 16 Leases.

Goodwill and intangible assets

Goodwill

Goodwill arises in the acquisition of a business when applying the acquisition method and is the excess of the fair value of the consideration transferred to acquire a business over the underlying fair value of the net identified assets acquired. It is allocated to groups of cash-generating units (CGUs), which are usually represented by the reported segments. Goodwill is tested for impairment

annually at the level of these groups of CGUs, and any impairment charges are recorded under "Other expense" in the consolidated income statement.

Intangible assets available for use

Novartis has the following classes of available for use intangible assets: currently marketed products; technologies; other intangible assets (including computer software).

Currently marketed products represent the composite value of acquired intellectual property (IP), patents, distribution rights and product trade names.

Technologies represent identified and separable acquired know-how used in the research, development and production processes.

Significant investments in internally developed and acquired computer software are capitalized and included in the "Other" category, and amortized once available for use.

Intangible assets available for use with a definite useful life are amortized over their estimated useful lives on a straight-line basis and are evaluated for potential impairment whenever facts and circumstances indicate that their carrying value may not be recoverable.

The following table shows the respective useful lives for intangible assets available for use and the location in the consolidated income statement in which the respective amortization and any potential impairment charge is recognized:

	Useful life	Income statement location for amortization and impairment charges
Currently marketed products	5 to 20 years	"Cost of goods sold"
Technologies	10 to 20 years	"Cost of goods sold" or "Research and development"
Other (including computer software)	3 to 7 years	In the respective functional expense

Intangible assets not yet available for use

Acquired research and development intangible assets that are still under development and have accordingly not yet obtained marketing approval are recognized as in-process research and development (IPR&D).

IPR&D is not amortized, but is evaluated for potential impairment on an annual basis or when facts and circumstances warrant. Any impairment charge is recorded in the consolidated income statement under "Research and development." Once a project included in IPR&D has been successfully developed, it is transferred to the "Currently marketed products" category.

Impairment of goodwill and intangible assets

An asset is considered impaired when its balance sheet carrying amount exceeds its estimated recoverable amount, which is defined as the higher of its fair value less costs of disposal and its value in use. Usually, Novartis applies the fair value less costs of disposal method for its impairment assessment. In most cases, no directly observable market inputs are available to measure the fair value less costs of disposal. Therefore, an estimate is derived indirectly and is based on net present value techniques utilizing post-tax cash flows and discount rates. In the limited cases where the value-in-use method would be applied, net present value techniques would be applied using pre-tax cash flows and discount rates.

Fair value less costs of disposal reflects estimates of assumptions that market participants would be expected to use when pricing the asset or CGUs, and for this purpose, management considers the range of economic conditions that are expected to exist over the remaining useful life of the asset.

The estimates used in calculating the net present values are highly sensitive and depend on assumptions specific to the nature of the Group's activities with regard to:

- Amount and timing of projected future cash flows
- Long-term sales forecasts
- Actions of competitors (launch of competing products, marketing initiatives, etc.)
- Sales erosion rates after the end of patent or other intellectual property rights protection, and timing of the entry of generic competition
- Outcome of research and development activities (compound efficacy, results of clinical trials, etc.)
- Amount and timing of projected costs to develop IPR&D into commercially viable products
- Profit margins
- Probability of obtaining regulatory approval
- Future tax rate
- Appropriate terminal growth rate
- Appropriate discount rate

Generally, for intangible assets with a definite useful life, Novartis uses cash flow projections for the whole useful life of these assets. For goodwill, Novartis generally utilizes cash flow projections for a five-year period based on management forecasts, with a terminal value based on cash flow projections usually in line with inflation rates for later periods. Probability-weighted scenarios are typically used.

Discount rates used consider the Group's estimated weighted average cost of capital, adjusted for specific asset, country and currency risks associated with cash flow projections, to approximate the discount rate that market participants would use to value the asset.

Due to the above factors, actual cash flows and values could vary significantly from forecasted future cash flows and related values derived using discounting techniques.

Impairment of associated companies accounted for at equity

Novartis considers investments in associated companies for impairment evaluation whenever objective evidence indicates the net investment may be impaired, including when a quoted share price indicates a fair value less than the per-share balance sheet carrying value for the investment.

If the recoverable amount of the investment is estimated to be lower than the balance sheet carrying amount, an impairment charge is recognized for the difference in the consolidated income statement under "Income from associated companies."

Cash and cash equivalents

Cash and cash equivalents include highly liquid investments with original maturities of three months or less, which are readily convertible to known amounts of cash. Bank overdrafts are usually presented within current financial debts on the consolidated balance sheet, except in cases where a right of offset has been agreed with a bank, which then allows for presentation on a net basis.

Marketable securities, commodities and non-current financial assets

Commodities, which include gold bullion or coins, are valued at the lower of cost or fair value using current market prices. The changes in fair value below cost are immediately recorded in "Other financial income and expense."

Marketable securities are financial assets held for short-term purposes which are principally traded in liquid markets and are classified within current assets on the consolidated balance sheet. The financial impacts related to these financial assets are recorded in "Other financial income and expense" in the consolidated income statement. Non-current financial assets held for long-term strategic purposes are classified within non-current assets on the consolidated balance sheet. The financial impacts related to these financial assets are recorded in "Other income" and "Other expense" in the consolidated income statement.

Marketable securities and non-current financial assets are initially recorded at fair value on their trade date, which is different from the settlement date when the transaction is ultimately effected. Quoted securities are remeasured at each reporting date to fair value based on current market prices. If the market for a financial asset is not active or no market is available, fair values are established using valuation techniques. The majority of non-quoted investments are valued initially at fair value through the established purchase price between a willing buyer and seller. Non-quoted investments are subsequently adjusted based on values derived from discounted cash flow analysis or other pricing models. These investment values are classified as "Level 3" in the fair value hierarchy.

The Group classifies and accounts for its marketable securities and non-current financial assets in the following categories:

- Debt securities are valued at fair value through other comprehensive income with subsequent recycling into the consolidated income statement, as they meet both the "solely payment of principal and interest" and the business model criteria. Unrealized gains and losses, except exchange gains and losses, are recorded as a fair value adjustment in the consolidated statement of comprehensive income. They are recognized in the consolidated income statement when the debt instrument is sold, at which time the gain is transferred to "Other financial income and expense." Exchange gains and losses related to debt instruments are immediately recognized in the consolidated income statement to "Other financial income and expense."
- Fund investments and equity securities of the Novartis venture fund are valued at fair value through profit and loss (FVPL). Unrealized gains and losses, including exchange gains and losses, are recognized in the consolidated income statement to "Other income" for gains and "Other expense" for losses.
- Equity securities held as strategic investments, typically held outside of the Novartis venture fund, are generally designated at the date of acquisition as financial assets valued at fair value through other comprehensive income with no subsequent recycling through profit and loss. Unrealized gains and losses, including exchange gains and losses, are recorded as a fair value adjustment in the consolidated statement of comprehensive income. They are reclassified to retained earnings when the equity security is sold. If these equity securities are not designated at the date of acquisition as financial assets valued at fair value through other comprehensive income, they are valued at FVPL, as described above.
- Other non-current financial assets, such as loans and long-term receivables from customers, advances and other deposits, are valued at amortized cost, which reflects the time value of money less any allowances for expected credit losses.

The Group assesses on a forward-looking basis the expected credit losses associated with its debt securities valued at fair value through other comprehensive income. Impairments on debt securities are recorded in "Other financial income and expense."

For other financial assets valued at amortized cost, impairments, which are based on their expected credit losses, and exchange rate losses are included in "Other expense" in the consolidated income statement. Exchange rate gains and interest income, using the effective interest rate method, are included in "Other income" or "Other financial income" in the consolidated income statement, depending on the nature of the item.

Derivative financial instruments

Derivative financial instruments are initially recognized in the balance sheet at fair value and are remeasured to their current fair value at the end of each subsequent reporting period. The valuation of a forward exchange rate contract is based on the discounted cash flow model, using interest curves and spot rates at the reporting date as observable inputs.

Options are valued based on a modified Black-Scholes model using volatility and exercise prices as major observable inputs.

The Group utilizes derivative financial instruments for the purpose of hedging to reduce the volatility in the Group's performance due to the exposure to various business related risks. To mitigate these risks, the Group

enters into certain derivative financial instruments. The risk reduction is obtained because the derivative's value or cash flows are expected, wholly or partly, to offset changes in the value or cash flows of the recognized assets or liabilities. The overall strategy is aiming to mitigate the currency and interest rate risk of positions that are contractually agreed, and to partially mitigate the exposure risk of selected anticipated transactions.

Certain derivative financial instruments meet the criteria for hedge accounting treatment. A prerequisite for obtaining this accounting-hedge relationship is extensive documentation on inception and proving on a regular basis that the economic hedge is effective for accounting purposes. Other derivative financial instruments do not meet the criteria to qualify for hedge accounting. Changes in the fair value of these derivative instruments are recognized immediately in "Other financial income and expense" in the consolidated income statement.

In addition, the Group has designated certain long-term debt components as hedges of the translation risk arising on certain net investments in foreign operations. On consolidation, foreign currency differences arising on long-term debt designated as net investment hedges of a foreign operation are recognized in other comprehensive income and accumulated in currency translation effects, to the extent that the hedge is effective. The foreign currency differences arising from hedge ineffectiveness are recognized in the income statement in "Other financial income and expense."

When a hedged net investment is disposed of, the proportionate portion of the cumulative amount recognized in equity in relation to the hedged net investment is transferred to the consolidated income statement as an adjustment to the gain or loss on disposal.

Inventories

Inventory is valued at the lower of acquisition or production cost determined on a first-in, first-out basis and net realizable value. This value is used for the "Cost of goods sold" in the consolidated income statement. Unsaleable inventory is fully written off in the consolidated income statement under "Cost of goods sold."

Trade receivables

Trade receivables are initially recognized at their invoiced amounts, including any related sales taxes less adjustments for estimated revenue deductions such as rebates, chargebacks and cash discounts.

The provisions for doubtful trade receivables are established using an expected credit loss model (ECL). The provisions are based on a forward-looking ECL, which includes possible default events on the trade receivables over the entire holding period of the trade receivable. These provisions represent the difference between the trade receivable's carrying amount in the consolidated balance sheet and the estimated collectible amount. Charges for doubtful trade receivables are recorded as marketing and selling costs recognized in the consolidated income statement within "Selling, general and administration" expenses.

Legal and environmental liabilities

Novartis and its subsidiaries are subject to contingencies arising in the ordinary course of business, such as patent litigation, environmental remediation liabilities and other product-related litigation, commercial litigation, and governmental investigations and proceedings. Provisions are recorded where a reliable estimate can be made of the probable outcome of legal or other disputes against the subsidiary.

Contingent consideration

In an acquisition or a divestment of a business, it is necessary to recognize contingent future amounts due to previous owners, representing contractually defined potential amounts as a liability or an asset. Usually for Novartis, these are linked to milestone or royalty payments related to certain assets and are recognized as a financial liability or financial asset at fair value, which is then remeasured at each subsequent reporting date. These estimations typically depend on factors such as technical milestones or market performance, and are adjusted for the probability of their likelihood of payment, and are appropriately discounted to reflect the impact of time.

Changes in the fair value of contingent consideration liabilities in subsequent periods are recognized in the consolidated income statement in "Cost of goods sold" for currently marketed products and in "Research and development" for IPR&D. Changes in contingent consideration assets are recognized in "Other income" or "Other expense," depending on their nature.

The effect of unwinding the discount over time is recognized for contingent liabilities in "Interest expense" and for contingent assets as interest income recognized in the consolidated income statement within "Other financial income and expense."

Defined benefit pension plans and other post-employment benefits

The liability in respect of defined benefit pension plans and other post-employment benefits is the defined benefit obligation calculated annually by independent actuaries using the projected unit credit method. The current service cost for such post-employment benefit plans is included in the personnel expenses of the various functions in which associates are employed, while the net interest on the net defined benefit liability or asset is recognized as "Other expense" or "Other income."

Treasury shares

Treasury shares are initially recorded at fair value on their trade date, which is different from the settlement date, when the transaction is ultimately effected. Treasury shares are deducted from consolidated equity at their nominal value of CHF 0.50 per share. Differences between the nominal amount and the transaction price on purchases or sales of treasury shares with third par-

ties, or the value of services received for the shares allocated to associates as part of share-based compensation arrangements, are recorded in "Retained earnings" in the consolidated statement of changes in equity.

Revenue recognition

Revenue on the sale of Novartis Group products and services, which is recorded as "Net sales" in the consolidated income statement, is recognized when a contractual promise to a customer (performance obligation) has been fulfilled by transferring control over the promised goods and services to the customer, substantially all of which is at the point in time of shipment to or receipt of the products by the customer or when the services are performed. If contracts contain customer acceptance provisions, revenue is recognized upon the satisfaction of the acceptance criteria. If products are stockpiled at the request of the customer, revenue is only recognized once the products have been inspected and accepted by the customer, and there is no right of return or replenishment on product expiry. The amount of revenue recognized is based on the consideration Novartis expects to receive in exchange for its goods and services, when it is highly probable that a significant reversal will not occur. If a contract contains more than one performance obligation, the consideration is allocated based on the standalone selling price of each performance obligation.

The consideration Novartis receives in exchange for its goods or services may be fixed or variable. Variable consideration is only recognized when it is highly probable that a significant reversal will not occur. The most common elements of variable consideration are listed below.

- Rebates and discounts granted to government agencies, wholesalers, retail pharmacies, managed healthcare organizations and other customers, as well as chargebacks are provisioned and recorded as a revenue deduction at the time the related revenues are recorded or when the incentives are offered. They are calculated on the basis of historical experience, regulations, the specific terms in the individual agreements, product pricing and the mix of products, contracts, channels and payors.
- Refunds granted to healthcare providers under innovative pay-for-performance agreements (i.e., outcome based arrangements) are provisioned and recorded as a revenue deduction at the time the related sales are recorded. They are calculated on the basis of historical experience and clinical data available for the product, as well as the specific terms in the individual agreements. In cases where historical experience and clinical data are not sufficient for a reliable estimation of the outcome, revenue recognition is deferred until the uncertainty is resolved or until such history is available.
- Cash discounts are offered to customers to encourage prompt payment and are provisioned and recorded as revenue deductions at the time the related sales are recorded.
- Shelf stock adjustments are generally granted to customers, primarily of the Sandoz Division, to cover the inventory held by them at the time a price decline becomes effective. Revenue deduction provisions for shelf stock adjustments are recorded when the price decline is anticipated, based on the impact of the price decline on the customer's estimated inventory levels.
- Sales returns provisions are recognized and recorded as revenue deductions when there is historical experience of Novartis agreeing to customer returns and Novartis can reasonably estimate expected future returns. In doing so, the estimated rate of return is applied, determined on the basis of historical experience of customer returns and considering any other relevant factors. This is applied to the amounts invoiced, also considering the amount of returned products to be destroyed versus products that can be placed back in inventory for resale. Where shipments are made on a resale or return basis, without sufficient historical experience for estimating sales returns, revenue is only recorded when there is evidence of consumption or when the right of return has expired.

Net sales and provisions for revenue deductions are adjusted to actual amounts as rebates, refunds, discounts and returns are processed. The provision represents estimates of the related obligations, requiring the use of judgment when estimating the effect of these sales deductions.

"Other revenue" includes income from profit-sharing arrangements with our collaboration partners, and royalty and milestone income from the out-licensing of intellectual property when Novartis retains an interest in the intellectual property through a license. Royalty income earned through a license is recognized when the underlying sales have occurred. Milestone income is recognized at the point in time when it is highly probable that the relevant milestone event criteria are met, and the risk of reversal of revenue recognition is remote. Other revenue also includes revenue from activities such as manufacturing or other services rendered, to the extent such revenue is not recorded under net sales, and is recognized when control transfers to the third party and our performance obligations are satisfied.

Research and development

Internal research and development (R&D) costs are fully charged to "Research and development" in the consolidated income statement in the period in which they are incurred. The Group considers that regulatory and other uncertainties inherent in the development of new products preclude the capitalization of internal development expenses as an intangible asset until marketing approval from a regulatory authority is obtained in a major market such as the United States, the European Union, Switzerland or Japan.

Payments made to third parties, such as contract research and development organizations in compensation for subcontracted R&D, that are deemed not to transfer intellectual property to Novartis are expensed as internal R&D expenses in the period in which they are incurred. Such payments are only capitalized if they meet the criteria for recognition of an internally generated intangible asset, usually when marketing approval has

been achieved from a regulatory authority in a major market.

Payments made to third parties to in-license or acquire intellectual property rights, compounds and products, including initial upfront and subsequent milestone payments, are capitalized, as are payments for other assets, such as technologies to be used in R&D activities. If additional payments are made to the originator company to continue to perform R&D activities, an evaluation is made as to the nature of the payments. Such additional payments will be expensed if they are deemed to be compensation for subcontracted R&D services not resulting in an additional transfer of intellectual property rights to Novartis. Such additional payments will be capitalized if they are deemed to be compensation for the transfer to Novartis of additional intellectual property developed at the risk of the originator company. Subsequent internal R&D costs in relation to IPR&D and other assets are expensed, since the technical feasibility of the internal R&D activity can only be demonstrated by the receipt of marketing approval for a related product from a regulatory authority in a major market.

Costs for post-approval studies performed to support the continued registration of a marketed product are recognized as marketing expenses. Costs for activities that are required by regulatory authorities as a condition for obtaining marketing approval are capitalized and recognized as currently marketed products.

Inventory produced ahead of regulatory approval is fully provisioned, and the charge is included in "Other expense" in the consolidated income statement, as its ultimate use cannot be assured. If this inventory can be subsequently sold, the provision is released to "Other income" in the consolidated income statement, either on approval by the appropriate regulatory authority or, exceptionally in Europe, on recommendation by the Committee for Medicinal Products for Human Use (CHMP), if approval is virtually certain.

Share-based compensation

Vested Novartis shares and American Depositary Receipts (ADRs) that are granted as compensation are valued at their market value on the grant date and are immediately expensed in the consolidated income statement.

The fair values of unvested restricted shares (RSs), restricted share units (RSUs) and performance share units (PSUs) in Novartis shares and ADRs granted to associates as compensation are recognized as an expense over the related vesting period. The expense recorded in the consolidated income statement is included in the personnel expenses of the various functions in which the associates are employed.

Unvested restricted shares, restricted ADRs and RSUs are only conditional on the provision of services by the plan participant during the vesting period. They are valued at fair value on the grant date. As RSUs do not entitle the holder to dividends, the fair value is based on the Novartis share price at the grant date adjusted for the net present value of the dividends expected to be paid during the holding period. The fair value of these grants, after making adjustments for assumptions related to forfeiture during the vesting period, is expensed on a straight-line basis over the respective vesting period.

PSUs are subject to the achievement of certain performance criteria during the vesting period and require plan participants to provide services during this period. The following paragraphs provide an overview of the accounting policies for the share-based compensation plans that grant PSUs.

For PSUs granted under plans that are subject to performance criteria based on Novartis internal performance metrics and that are conditional on the provision of service by plan participants during the vesting period, the expense is recognized on a straight-line basis over the vesting period, and is determined based on assumptions concerning the expected performance against the internal performance metrics throughout the vesting period. The assumptions are based on the Group's targets for those performance metrics, and the expected forfeitures due to plan participants not meeting their service conditions. The assumptions are periodically adjusted over the vesting period. Any change in estimates for past services is recorded immediately as an expense or income in the consolidated income statement, and amounts for the remaining vesting period are expensed on a straight-line basis. As a result, at the end of the vesting period, the charge during the entire vesting period represents the amount that will finally vest. The number of equity instruments that finally vest is determined at the vesting date.

For PSUs granted under plans that are subject to performance criteria based on variables that can be observed in the market, which for Novartis plans is the Novartis total shareholder return (TSR) relative to a specific peer group of companies over the vesting period, and that are conditional on the provision of services by the plan participants during the vesting period, the expense is recognized on a straight-line basis over the vesting period, and is determined based on the total fair value of the grant over the vesting period. IFRS requires that these variables that can be observed in the market are taken into account in determining the fair value of the PSUs at the grant date. Novartis determined the fair value of these PSUs at the date of grant using a Monte Carlo simulation model. Adjustments to the number of equity instruments granted are only made if a plan participant does not fulfill the service conditions.

For PSUs granted under plans that are subject to both performance criteria based on Novartis internal performance metrics and Novartis TSR relative to a specific peer group of companies over the vesting period and that are conditional on the provision of service by plan participants during the vesting period, the expense is recognized on a straight-line basis over the vesting period, and is determined based on a bifurcation into the components based on the performance criteria related to Novartis internal performance metrics and TSR, as described in the paragraphs above.

Measuring the fair values of PSUs granted that include TSR performance criteria requires use of estimates. The Monte Carlo simulation used to determine the fair value of the PSUs TSR performance criteria requires the probability of factors related to uncertain future events; the term of the award; the grant price of underlying shares or ADRs; expected volatilities; the

expected correlation matrix of the underlying equity instruments with those of the peer group of companies; and the risk-free interest rate as input parameters.

If a plan participant leaves Novartis for reasons other than retirement, disability or death, then unvested restricted shares, restricted ADRs, RSUs and PSUs are forfeited, unless determined otherwise by the provision of the plan rules or by the Compensation Committee of the Novartis Board of Directors, for example, in connection with a reorganization or divestment.

Government grants

Grants from governments or similar organizations are recognized at their fair value when there is a reasonable assurance that the grant will be received and the Group will comply with all attached conditions.

Government grants received to compensate for cost are deferred and recognized in the consolidated income statement over the period necessary to match them against the related costs that they are intended to compensate.

The accounting policy for property, plant and equipment describes the treatment of any related grants.

Restructuring charges

Restructuring provisions are recognized for the direct expenditures arising from the restructuring, where the plans are sufficiently detailed and where appropriate communication to those affected has been made.

Charges to increase restructuring provisions are included in "Other expense" in the consolidated income statements. Corresponding releases are recorded in "Other income" in the consolidated income statement.

Healthcare contributions

Healthcare contribution levies and fees under governmental programs that require the Group to contribute to a country's healthcare costs, other than programs described in Revenue recognition in this Note 1, are recognized in Other expense in the consolidated income statement. Provisions for healthcare contributions are adjusted to the actual amounts levied. The provision represents estimates of the related obligations, requiring the use of judgment when estimating the effect of these healthcare contributions.

Taxes

Taxes on income are provided in the same periods as the revenues and expenses to which they relate and include interest and penalties incurred during the period. Deferred taxes are determined using the comprehensive liability method and are calculated on the temporary differences that arise between the tax base of an asset or liability and its carrying value in the balance sheet prepared for consolidation purposes, except for those temporary differences related to investments in subsidiaries and associated companies, where the timing of their reversal can be controlled and it is probable that the difference will not reverse in the foreseeable future. Since the retained earnings are reinvested, withholding or other taxes on eventual distribution of a subsidiary's retained earnings are only taken into account when a dividend has been planned.

The estimated amounts for current and deferred tax assets or liabilities, including any amounts related to any uncertain tax positions, are based on currently known facts and circumstances. Tax returns are based on an interpretation of tax laws and regulations, and reflect estimates based on these judgments and interpretations. The tax returns are subject to examination by the competent taxing authorities, which may result in an assessment being made requiring payments of additional tax, interest or penalties. Inherent uncertainties exist in the estimates of the tax positions.

Impact of adopting significant new IFRS standard in 2020

The following new IFRS standard has been adopted by Novartis from January 1, 2020:

IFRS 3 Business Combination amendments
The IASB issued amendments to IFRS 3 Business Combinations that revised the definition of a business, which assist entities with the evaluation of when an asset or group of assets acquired should be considered a business. This amended standard has been applied to transactions entered into on or after January 1, 2020. The amended standard allows an entity to apply an optional concentration test, on a transaction-by-transaction basis, to evaluate whether substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or group of similar identifiable assets. If this optional concentration test is met, the set of activities and assets is determined not to be a business. The adoption of this amended standard on January 1, 2020 did not have a significant impact on our consolidated financial statements and is not expected to have a significant impact in future periods. However, this will depend on the facts and circumstances of future transactions and if the Group decides to apply the optional concentration test in the assessment of whether an acquired set of activities and assets is or is not a business.

There are no other IFRS standards or interpretations not yet effective that would be expected to have a material impact on the Group.

Impact of adopting significant new IFRS standard in 2019

The following new IFRS standard has been adopted by Novartis from January 1, 2019:

IFRS 16 Leases
IFRS 16 Leases substantially changed the financial statements, as the majority of leases for which the Group is

the lessee became on-balance sheet liabilities with corresponding right-of-use assets also recognized on the balance sheet. The lease liability reflects the net present value of the remaining lease payments, and the right-of-use asset corresponds to the lease liability, adjusted for payments made before the commencement date, lease incentives and other items related to the lease agreement. The standard replaces IAS 17 Leases and related interpretations.

Upon adoption of the new standard, a portion of the annual operating lease costs, which was previously fully recognized as functional expenses, as a component of operating income, is recorded as interest expense. In addition, the portion of the lease payments that represents the reduction of the lease liability is recognized in the cash flow statement as an outflow from financing activities, which was previously fully recognized as an outflow from operating activities. Given the leases involved, these effects are not significant to the consolidated income statement and consolidated statement of cash flow.

The Group implemented the new standard on January 1, 2019, and applied the modified retrospective method, with right-of-use assets measured at an amount equal to the lease liability, adjusted by the amount of the prepaid or accrued lease payments relating to those leases recognized in the balance sheet immediately before the date of initial application and did not restate prior years.

Results of our impact assessment:
The undiscounted operating lease commitments as of December 31, 2018, amounted to USD 3.6 billion. This includes approximately USD 0.1 billion of leases with a commencement date in 2019, as well as short-term leases and low-value leases that are recognized from January 1, 2019, upon adoption of IFRS 16, on a straight-line basis as expense in profit and loss. This also includes USD 0.2 billion lease commitments related to the Alcon Division, which is attributable to discontinued operation in 2019. For the remaining undiscounted lease commitments attributable to continuing operations of USD 3.3 billion, the Group recognized on January 1, 2019, lease liabilities of USD 1.74 billion and right-of-use assets of USD 1.55 billion (after the reclassification of USD 0.1 billion from property, plant and equipment, and net adjustments for the USD 0.3 billion recognition of sublease receivables, prepayments, and accrued lease payments recognized as at December 31, 2018). For the lease commitments attributable to discontinued operations, the Group recognized on January 1, 2019, lease liabilities and right-of-use assets of USD 0.2 billion. This does not include the discontinued operations right-of-use assets and lease liability on finance lease agreements of USD 75 million and USD 89 million, respectively. There was an insignificant increase to retained earnings upon adoption of IFRS 16 of USD 3 million that arose from subleases that were accounted for as operating lease agreements under IAS 17 and are accounted for as finance leases under IFRS 16.

As a lessor, the Group had no significant impact upon adoption.

For additional significant accounting policies applicable to the discontinued operations business see Note 30.

2. Significant transactions

Significant transactions in 2020

The Group applied the acquisition method of accounting for businesses acquired, and did not elect to apply the optional concentration test to account for acquired business as an asset separately acquired.

Innovative Medicines – acquisition of The Medicines Company

On November 23, 2019, Novartis entered into an agreement and plan of merger (the Merger Agreement) with The Medicines Company, a US-based pharmaceutical company headquartered in Parsippany, New Jersey USA. Pursuant to the Merger Agreement, on December 5, 2019, Novartis, through a subsidiary, commenced a tender offer to acquire all outstanding shares of The Medicines Company for USD 85 per share, or a total consideration of approximately USD 9.6 billion in cash on a fully diluted basis, including the equivalent share value related to The Medicines Company's convertible notes, in accordance with their terms. The tender offer expired on January 3, 2020, and on January 6, 2020, the acquiring subsidiary merged with and into The Medicines Company, resulting in The Medicines Company becoming an indirect wholly owned subsidiary of Novartis. Novartis financed the transaction through available cash, and short- and long-term borrowings.

The Medicines Company is focused on the development of inclisiran, a potentially first-in-class, twice yearly therapy that allows administration during patients' routine visits to their healthcare professionals and will potentially contribute to improved patient adherence and sustained lower LDL-C levels.

The fair value of the total purchase consideration was USD 9.6 billion. The purchase price allocation resulted in net identifiable assets of approximately USD 7.1 billion, consisting of USD 8.5 billion intangible assets, USD 1.4 billion net deferred tax liabilities and goodwill of approximately USD 2.5 billion.

Results of operations since the date of acquisition were not material.

Sandoz – acquisition of the Japanese business of Aspen Global Incorporated

On November 11, 2019, Sandoz entered into an agreement for the acquisition of the Japanese business of Aspen Global Incorporated (AGI), a wholly owned subsidiary of Aspen Pharmacare Holdings Limited. Under the agreement, Sandoz acquired the shares in Aspen Japan K.K. and associated assets held by AGI. The transaction closed on January 31, 2020.

Aspen's portfolio in Japan consists of off-patent medicines with a focus on anesthetics and specialty brands. The acquisition will enable Sandoz to expand its presence in the third-largest worldwide generics marketplace.

The purchase price consists of EUR 274 million (USD 303 million) upfront payment, less customary purchase price adjustment of EUR 27 million (USD 30 million), plus potential milestone payments of up to EUR 70 million (USD 77 million), which AGI is eligible to receive upon the achievement of specified milestones.

The fair value of the total purchase consideration was EUR 294 million (USD 324 million). The amount consisted of a cash payment of EUR 247 million (USD 273 million) and the fair value of contingent consideration of EUR 47 million (USD 51 million), which AGI is eligible to receive upon the achievement of specified milestones. The purchase price allocation resulted in net identifiable assets of USD 238 million, consisting of USD 196 million intangible assets, USD 26 million other net assets, USD 16 million net deferred tax assets. Goodwill amounted to USD 86 million. Results of operations since the date of acquisition were not material.

Sandoz – retention of US dermatology business and generic US oral solids portfolio, previously planned to be divested

On September 6, 2018, Novartis announced that it entered into a stock and asset purchase agreement (SAPA) with Aurobindo Pharma USA Inc. (Aurobindo) for the sale of selected portions of its Sandoz US portfolio, specifically the Sandoz US dermatology business and generic US oral solids portfolio, for USD 0.8 billion in cash and potential earnouts. The closing was conditional on obtaining regulatory approval.

In March 2020, Novartis took the decision to retain the Sandoz US generic oral solids and dermatology businesses and on April 2, 2020 entered into a mutual agreement with Aurobindo to terminate the transaction. The decision was taken as approval from the US Federal Trade Commission for the transaction was not obtained within the agreed timelines.

The cumulative amount of the depreciation on property, plant and equipment (USD 38 million) and amortization on intangible assets (USD 102 million), not recorded in the consolidated income statement since the date of classification as held for sale was recognized in the consolidated income statement in the first quarter of 2020. In addition, an impairment of currently marketed products of USD 42 million was recognized in the first quarter of 2020 consolidated income statement.

As at March 31, 2020, the assets and liabilities of the Sandoz US generic oral solids and dermatology businesses were reclassified out of assets and liabilities of disposal group held for sale. The prior year balance sheet is not required to be restated.

In the Group's consolidated balance sheet at December 31, 2019, the assets and liabilities classified as disposal group assets and liabilities held for sale consisted of the following:

(USD millions)	December 31, 2019
Assets of disposal group classified as held for sale	
Property, plant and equipment	169
Intangible assets other than goodwill	475
Deferred tax assets	11
Other non-current assets	2
Inventories	181
Other current assets	3
Total	**841**

(USD millions)	December 31, 2019
Liabilities of disposal group classified as held for sale	
Deferred tax liabilities	2
Provisions and other non-current liabilities	4
Provisions and other current liabilities	25
Total	**31**

There were no cumulative income or expenses included in the other comprehensive income relating to the disposal group.

Significant transactions in 2019

Completion of the spin-off of the Alcon business through a dividend in kind distribution to Novartis AG shareholders

On June 29, 2018, Novartis announced its intention to seek shareholder approval for the spin-off of the Alcon business into a separately traded standalone company, following the complete structural separation of the Alcon business into a standalone company (the Alcon business or Alcon Inc.).

The Novartis AG shareholders approved the spin-off of the Alcon business at the 2019 Annual General Meeting held on February 28, 2019, subject to completion of certain conditions precedent to the distribution. Upon shareholder approval, the Alcon business was reported as discontinued operations, and the fair value of the Alcon business exceeded the carrying value of its net assets.

The conditions precedent to the spin-off were met and on April 8, 2019 the spin-off of the Alcon business was effected by way of a distribution of a dividend in kind of Alcon Inc. shares to Novartis AG shareholders and ADR (American Depositary Receipt) holders (the Distribution), which amounted to USD 23.4 billion and is recognized as a reduction to retained earnings. Through the

Distribution, each Novartis AG shareholder received one Alcon Inc. share for every five Novartis AG shares/ADRs they held on April 8, 2019, close of business. As of April 9, 2019, the shares of Alcon Inc. are listed on the SIX Swiss Exchange (SIX) and on the New York Stock Exchange (NYSE) under the symbol "ALC."

The dividend in kind distribution liability to effect the spin-off of the Alcon business (the distribution liability) amounted to USD 26.4 billion at March 31, 2019, unchanged from its initial recognition on February 28, 2019, and was in excess of the carrying value of the Alcon business net assets as of February 28, 2019, and as of March 31, 2019. The net assets of the Alcon business amounted to USD 23.1 billion as at March 31, 2019.

On March 6, 2019, Alcon entered into financing arrangements with a syndicate of banks under which it borrowed on April 2, 2019, a total amount of USD 3.2 billion. These borrowings consisted of approximately USD 2.8 billion and the equivalent of USD 0.4 billion in EUR in bridge and other term loans under such Alcon facilities agreement. In addition, approximately USD 0.3 billion of borrowings under a number of local bilateral facilities in different countries, with the largest share of borrowings in Japan, were raised. This resulted in a total gross debt of USD 3.5 billion. These outstanding borrowings of the Alcon legal entities were recorded in the balance sheet and financing cash flow from discontinued operations. Prior to the spin-off, through a series of intercompany transactions, Alcon legal entities paid approximately USD 3.1 billion in cash to Novartis and its affiliates.

At the April 8, 2019 Distribution, the fair value of the distribution liability of the Alcon business amounted to USD 23.4 billion, a decrease of USD 3.0 billion from March 31, 2019. As mentioned above, prior to the spin-off, through a series of intercompany transactions, Alcon legal entities incurred additional net financial debt and paid approximately USD 3.1 billion in cash to Novartis and its affiliates. This additional net debt and transactions resulted in a decrease in Alcon's net assets to USD 20.0 billion at the date of the Distribution of the dividend in kind to Novartis AG shareholders on April 8, 2019. The distribution liability at April 8, 2019, remained in excess of the then-carrying value of the Alcon business net assets.

Certain consolidated foundations own Novartis AG dividend-bearing shares restricting their availability for use by the Group. These Novartis AG shares are accounted for as treasury shares. Through the Distribution, these foundations received Alcon Inc. shares representing an approximate 4.7% equity interest in Alcon Inc. Upon the loss of control of Alcon Inc. through the Distribution, the financial investment in Alcon Inc. was recognized at its fair value based on the opening traded share price of Alcon Inc. on April 9, 2019 (a Level 1 hierarchy valuation). At initial recognition, its fair value of USD 1.3 billion was reported on the Group's consolidated balance sheet as a financial asset. Management has designated this investment at fair value through other comprehensive income.

The total non-taxable, non-cash gain recognized at the distribution date of the spin-off of the Alcon business amounted to USD 4.7 billion consisting of:

(USD millions)	April 8, 2019
Net assets derecognized [1]	– 20 025
Derecognition of distribution liability	23 434
Difference between net assets and distribution liability	**3 409**
Recognition of Alcon Inc. shares obtained through consolidated foundations	1 273
Currency translation gains recycled into the consolidated income statement	123
Transaction costs recognized in the consolidated income statement	– 114
Gain on distribution of Alcon Inc. to Novartis AG shareholders	**4 691**

[1] See Note 30 for additional information.

For additional disclosures on discontinued operations, refer to Note 30.

Innovative Medicines – acquisition of IFM Tre, Inc.

On May 7, 2019, Novartis acquired IFM Tre, Inc., a privately held, US-based biopharmaceutical company focused on developing anti-inflammatory medicines targeting the NLRP3 inflammasome. The acquisition gives Novartis full rights to IFM Tre, Inc.'s portfolio of NLRP3 antagonists. The NLRP3 antagonists portfolio consists of one clinical program and two preclinical programs: IFM-2427, a first-in-class, clinical-stage systemic antagonist for an array of chronic inflammatory disorders, including atherosclerosis and nonalcoholic steatohepatitis (NASH); a preclinical-stage gut-directed molecule for the treatment of inflammatory bowel disease; and a preclinical-stage central nervous system (CNS)-penetrant molecule.

The previously held interest of 9% was adjusted to its fair value of USD 33 million through the consolidated income statement at acquisition date. This remeasurement resulted in a gain of USD 14 million. The fair value of the total purchase consideration for acquiring the 91% stake Novartis did not already own amounted to USD 361 million. The amount consisted of an initial cash payment of USD 285 million, and the fair value of the contingent consideration of USD 76 million due to the IFM Tre, Inc. shareholders, which they are eligible to receive upon the achievement of specified development and commercialization milestones. The purchase price allocation resulted in net identifiable assets of USD 355 million, mainly intangible assets, and goodwill of USD 39 million. The 2019 results of operations since the date of acquisition were not material.

Innovative Medicines – acquisition of *Xiidra*

On May 8, 2019, Novartis entered into an agreement with Takeda Pharmaceutical Company Limited (Takeda) to acquire the assets associated with *Xiidra* (lifitegrast ophthalmic solution) 5% worldwide. *Xiidra* is the first and only prescription treatment approved to treat both signs and symptoms of dry eye by inhibiting inflammation caused by the disease. The transaction bolsters the Novartis front-of-the-eye portfolio and ophthalmic leadership. The transaction closed on July 1, 2019. The purchase price consists of a USD 3.4 billion upfront payment, customary purchase price adjustments of USD 0.1 billion, and the potential milestone payments of up to USD 1.9

billion, which Takeda is eligible to receive upon the achievement of specified commercialization milestones.

The fair value of the total purchase consideration is USD 3.7 billion. The amount consists of an initial cash payment of USD 3.5 billion, and the fair value of the contingent consideration of USD 0.2 billion, which Takeda is eligible to receive upon the achievement of specified commercialization milestones.

The purchase price allocation resulted in net identifiable assets of approximately USD 3.6 billion, consisting mainly of intangible assets of USD 3.6 billion, and goodwill amounted to approximately USD 0.1 billion. In 2019, from the date of acquisition, the business generated net sales of USD 0.2 billion. Management estimates that net sales for the entire year of 2019 would have amounted to USD 0.3 billion, had the business been acquired at the beginning of the 2019 reporting period. The 2019 results of operations since the date of acquisition were not material.

Significant transactions in 2018

Innovative Medicines – acquisition of Advanced Accelerator Applications S.A.

On October 30, 2017, Novartis entered into a binding memorandum of understanding with Advanced Accelerator Applications S.A. (AAA), a company headquartered in Saint-Genis-Pouilly, France, under which Novartis agreed to commence a tender offer for 100% of the share capital of AAA subject to certain conditions. Novartis commenced the tender offer on December 7, 2017, to purchase all of the outstanding ordinary shares for a price of USD 41 per share and USD 82 per American Depositary Share (ADS), each representing two ordinary shares of AAA, which expired on January 19, 2018. The offer valued AAA's equity at USD 3.9 billion, on a fully diluted basis.

As of January 19, 2018, the expiration date of the tender offer, approximately 97% of the then-outstanding fully diluted ordinary shares, including ordinary shares represented by ADSs (hereinafter collectively referred to as "the outstanding shares"), were validly tendered. On January 22, 2018, Novartis accepted and paid USD 3.9 billion for the outstanding shares tendered in the offer. On January 22, 2018, Novartis commenced a subsequent offering period that expired on January 31, 2018. As of the expiration of the subsequent offering period, an additional 1.8% of the outstanding shares were validly tendered. Novartis accepted and paid approximately USD 60 million, resulting in an increase in Novartis ownership in AAA to 98.7%.

The fair value of the total purchase consideration was USD 3.9 billion. The purchase price allocation resulted in net identifiable assets of approximately USD 1.9 billion, consisting of USD 2.5 billion intangible assets, USD 0.6 billion net deferred tax liabilities, and goodwill of approximately USD 2.0 billion. In 2018, from the date of the acquisition, the business generated net sales of USD 0.4 billion. Management estimated that net sales for the entire year of 2018 would have amounted to USD 0.4 billion had AAA been acquired at the beginning of 2018. The 2018 results from operations since the acquisition were not material.

As of December 31, 2020, Novartis held 99.2% of the then-outstanding fully diluted ordinary shares, including ordinary shares represented by ADSs.

AAA is a radiopharmaceutical company that develops, produces and commercializes molecular nuclear medicines – including *Lutathera* (USAN: lutetium Lu 177 dotatate/INN: lutetium (^{177}Lu) oxodotreotide), a first-in-class radioligand therapy product for neuroendocrine tumors – and a portfolio of diagnostic products. Radiopharmaceuticals, such as *Lutathera*, are unique medicinal formulations containing radioisotopes, which are used clinically for both diagnosis and therapy.

Innovative Medicines – acquisition of AveXis, Inc.

On April 6, 2018, Novartis entered into an agreement and plan of merger with AveXis, Inc., a US-based clinical stage gene therapy company, under which Novartis commenced on April 17, 2018, a tender offer to purchase all outstanding common stock of AveXis, Inc. for USD 218 per share in cash. On May 15, 2018, Novartis completed the acquisition of the common stock of AveXis, Inc. and paid a total of USD 8.7 billion.

The fair value of the total purchase consideration was USD 8.7 billion. The purchase price allocation resulted in net identifiable assets of approximately USD 7.2 billion, consisting of USD 8.5 billion intangible assets, USD 1.6 billion net deferred tax liabilities and other net assets of USD 0.3 billion, and goodwill of approximately USD 1.5 billion. The 2018 results of operations since the date of acquisition were not material.

AveXis, Inc. is focused on developing and commercializing novel treatments for patients suffering from rare and life-threatening neurological genetic diseases. AveXis, Inc.'s initial product candidate, AVXS-101, is a proprietary gene therapy currently in development for the treatment of spinal muscular atrophy (SMA) type 1 – the leading genetic cause of infant mortality – and SMA types 2 and 3. In addition, AveXis, Inc. has a pipeline of other novel treatments for rare neurological diseases, including Rett syndrome (RTT) and a genetic form of amyotrophic lateral sclerosis (ALS) caused by mutations in the superoxide dismutase 1 (SOD1) gene.

Innovative Medicines – acquisition of Endocyte, Inc.

On October 18, 2018, Novartis entered into an agreement and plan of merger with Endocyte, Inc. (Endocyte), a US-based biopharmaceutical company focused on developing targeted therapeutics for cancer treatment. The transaction was completed on December 21, 2018. Under the terms of the agreement, Novartis acquired all outstanding shares of Endocyte common stock for USD 24 per share. The total consideration amounted to USD 2.1 billion.

The fair value of the total purchase consideration was USD 2.1 billion. The purchase price allocation resulted in net identifiable assets of approximately USD 1.5 billion, consisting of USD 1.5 billion intangible assets, USD 0.3 billion net deferred tax liabilities and other net assets of USD 0.3 billion, and goodwill of approximately USD 0.6 billion. The purchase price allocation was preliminary at December 31, 2018, as the transaction closed on December 21, 2018, which was close to the Group's year-end and therefore did not provide sufficient time to complete the valuation of the intangible assets, deferred taxes,

assumed liabilities and goodwill. During 2019, there were no significant revisions to the purchase price allocation.

Endocyte uses drug conjugation technology to develop targeted therapies with companion imaging agents, including 177Lu-PSMA-617, a potential first-in-class investigational radioligand therapy for the treatment of metastatic castration-resistant prostate cancer (mCRPC).

Corporate – divestment of 36.5% stake in GlaxoSmithKline Consumer Healthcare Holdings Ltd.
On March 27, 2018, Novartis entered into an agreement with GlaxoSmithKline plc (GSK) to divest its 36.5% stake in GlaxoSmithKline Consumer Healthcare Holdings Ltd. to GSK for USD 13.0 billion in cash. As a result, Novartis discontinued the use of equity method accounting starting from April 1, 2018.

On June 1, 2018, the transaction closed and Novartis realized a pre-tax gain of USD 5.8 billion, recorded in income from associated companies.

For significant transactions in 2019 for discontinued operations, see Note 30. There were no significant transactions in 2020 for discontinued operations.

3. Segmentation of key figures 2020, 2019 and 2018

The businesses of Novartis are divided operationally on a worldwide basis into two identified reporting segments: Innovative Medicines and Sandoz. In addition, we separately report Corporate activities.

Reporting segments are presented in a manner consistent with the internal reporting to the chief operating decision-maker, which is the Executive Committee of Novartis. The reporting segments are managed separately because they each research, develop, manufacture, distribute and sell distinct products that require differing marketing strategies.

The Executive Committee of Novartis is responsible for allocating resources and assessing the performance of the reporting segments.

The reporting segments are as follows:

Innovative Medicines researches, develops, manufactures, distributes and sells patented prescription medicines. The Innovative Medicines Division is organized into two global business units: Novartis Oncology and Novartis Pharmaceuticals. Novartis Oncology consists of the global business franchise Oncology, and Novartis Pharmaceuticals consists of the global business franchises Immunology, Hepatology and Dermatology; Ophthalmology; Neuroscience; Cardiovascular, Renal and Metabolism; Respiratory; and Established Medicines.

Sandoz develops, manufactures and markets finished dosage form medicines as well as intermediary products including active pharmaceutical ingredients. Sandoz is organized globally into three franchises: Retail Generics, Anti-Infectives and Biopharmaceuticals. In Retail Generics, Sandoz develops, manufactures and markets active ingredients and finished dosage forms of small molecule pharmaceuticals to third parties across a broad range of therapeutic areas, as well as finished dosage form of anti-infectives sold to third parties. In Anti-Infectives, Sandoz manufactures and supplies active pharmaceutical ingredients and intermediates, mainly antibiotics, for internal use by Retail Generics and for sale to third-party customers. In Biopharmaceuticals, Sandoz develops, manufactures and markets protein- or other biotechnology-based products, including biosimilars, and provides biotechnology manufacturing services to other companies.

Income and expenses relating to Corporate include the costs of the Group headquarters and those of corporate coordination functions in major countries. In addition, Corporate includes other items of income and expense that are not attributable to specific segments, such as certain revenues from intellectual property rights, certain expenses related to post-employment benefits, environmental remediation liabilities, charitable activities, donations and sponsorships. Usually, no allocation of Corporate items is made to the segments. As a result, Corporate assets and liabilities principally consist of net liquidity (cash and cash equivalents, marketable securities less financial debts), investments in associated companies, and current and deferred taxes and non-segment-specific environmental remediation and post-employment benefit liabilities.

Our divisions are supported by the Novartis Institutes for BioMedical Research, Global Drug Development, Novartis Technical Operations and Novartis Business Services organizations.

- The Novartis Institutes for BioMedical Research (NIBR) conducts research activities for the Innovative Medicines Division and also collaborates with Sandoz.
- The Global Drug Development organization oversees all drug development activities for our Innovative Medicines Division and collaborates with our Sandoz Division on the development of its biosimilars portfolio.
- The Novartis Technical Operations organization manages our manufacturing operations across our Innovative Medicines and Sandoz Divisions.
- Novartis Business Services (NBS) is our shared services organization that delivers business support services across the Group, such as information technology, real estate and facility services, procurement, product lifecycle services, human resources, and financial reporting and accounting operations.

Following the February 28, 2019, shareholders' approval of the spin-off of the Alcon business (refer to Notes 1, 2 and 30 for further details), the Group reported its consolidated financial statements as "continuing operations" and "discontinued operations."

Continuing operations comprise the activities of the Innovative Medicines and Sandoz Divisions, and the continuing Corporate activities.

Discontinued operations include the operational results from the Alcon eye care devices business and certain corporate activities attributable to the Alcon business prior to the spin-off, the gain on distribution of Alcon Inc. to Novartis AG shareholders, and certain other expenses related to the Distribution (refer to Notes 1, 2 and 30 for further details).

The accounting policies mentioned in Note 1 are used in the reporting of segment results. Inter-segmental sales are made at amounts that are considered to approximate arm's length transactions. The Executive Committee of Novartis evaluates segmental performance and allocates resources among the segments based on a number of measures, including net sales, operating income and net operating assets. Segment net operating assets consist primarily of property, plant and equipment; right-of-use assets; intangible assets; goodwill; inventories; and trade and other operating receivables less operating liabilities.

Segmentation – consolidated income statements

	Innovative Medicines		Sandoz		Corporate (including eliminations)		Group	
(USD millions)	**2020**	2019	**2020**	2019	**2020**	2019	**2020**	2019
Net sales to third parties from continuing operations	**39 013**	**37 714**	**9 646**	**9 731**			**48 659**	**47 445**
Sales to continuing and discontinued segments	792	783	189	141	– 981	– 871		53
Net sales from continuing operations	**39 805**	**38 497**	**9 835**	**9 872**	**– 981**	**– 871**	**48 659**	**47 498**
Other revenues	1 018	1 092	53	63	168	24	1 239	1 179
Cost of goods sold	– 10 927	– 10 050	– 5 252	– 5 334	1 058	959	– 15 121	– 14 425
Gross profit from continuing operations	**29 896**	**29 539**	**4 636**	**4 601**	**245**	**112**	**34 777**	**34 252**
Selling, general and administration	– 11 657	– 11 617	– 2 076	– 2 218	– 464	– 534	– 14 197	– 14 369
Research and development	– 8 118	– 8 152	– 862	– 1 250			– 8 980	– 9 402
Other income	922	1 586	176	167	644	278	1 742	2 031
Other expense	– 1 871	– 2 069	– 831	– 749	– 488	– 608	– 3 190	– 3 426
Operating income from continuing operations	**9 172**	**9 287**	**1 043**	**551**	**– 63**	**– 752**	**10 152**	**9 086**
Income from associated companies	1	1	2	2	670	656	673	659
Interest expense							– 869	– 850
Other financial income and expense							– 78	45
Income before taxes from continuing operations							**9 878**	**8 940**
Taxes							– 1 807	– 1 793
Net income from continuing operations							**8 071**	**7 147**
Net loss from discontinued operations before gain on distribution of Alcon Inc. to Novartis AG shareholders								– 101
Gain on distribution of Alcon Inc. to Novartis AG shareholders								4 691
Net income from discontinued operations								**4 590**
Net income							**8 071**	**11 737**
Attributable to:								
Shareholders of Novartis AG							*8 072*	*11 732*
Non-controlling interests							*– 1*	*5*
Included in net income from continuing operations are:								
Interest income							91	245
Depreciation of property, plant and equipment	– 912	– 952	– 282	– 283	– 124	– 110	– 1 318	– 1 345
Depreciation of right-of-use assets	– 273	– 247	– 41	– 41	– 16	– 17	– 330	– 305
Amortization of intangible assets	– 3 080	– 2 509	– 370	– 315	– 12	– 12	– 3 462	– 2 836
Impairment charges on property, plant and equipment, net	– 324	– 100	– 116	– 101		– 1	– 440	– 202
Impairment charges on intangible assets, net	– 768	– 632	– 141	– 506	– 5		– 914	– 1 138
Impairment charges and fair value changes on financial assets, net	153	18			182	20	335	38
Additions to restructuring provisions	– 217	– 229	– 98	– 165	– 39	– 98	– 354	– 492
Equity-based compensation of Novartis equity plans	– 714	– 761	– 64	– 67	– 180	– 239	– 958	– 1 067

(USD millions)	Innovative Medicines 2019	Innovative Medicines 2018	Sandoz 2019	Sandoz 2018	Corporate (including eliminations) 2019	Corporate (including eliminations) 2018	Group 2019	Group 2018
Net sales to third parties from continuing operations	**37 714**	**34 892**	**9 731**	**9 859**			**47 445**	**44 751**
Sales to continuing and discontinued segments	783	741	141	177	– 871	– 836	53	82
Net sales from continuing operations	**38 497**	**35 633**	**9 872**	**10 036**	**– 871**	**– 836**	**47 498**	**44 833**
Other revenues	1 092	1 188	63	62	24	16	1 179	1 266
Cost of goods sold	– 10 050	– 9 870	– 5 334	– 5 530	959	890	– 14 425	– 14 510
Gross profit from continuing operations	**29 539**	**26 951**	**4 601**	**4 568**	**112**	**70**	**34 252**	**31 589**
Selling, general and administration	– 11 617	– 10 907	– 2 218	– 2 305	– 534	– 505	– 14 369	– 13 717
Research and development	– 8 152	– 7 675	– 1 250	– 814			– 9 402	– 8 489
Other income	1 586	977	167	505	278	147	2 031	1 629
Other expense	– 2 069	– 1 475	– 749	– 622	– 608	– 512	– 3 426	– 2 609
Operating income from continuing operations	**9 287**	**7 871**	**551**	**1 332**	**– 752**	**– 800**	**9 086**	**8 403**
Income from associated companies	1	1	2	5	656	6 432	659	6 438
Interest expense							– 850	– 932
Other financial income and expense							45	186
Income before taxes from continuing operations							**8 940**	**14 095**
Taxes							– 1 793	– 1 295
Net income from continuing operations							**7 147**	**12 800**
Net loss from discontinued operations before gain on distribution of Alcon Inc. to Novartis AG shareholders							– 101	– 186
Gain on distribution of Alcon Inc. to Novartis AG shareholders							4 691	
Net income/(loss) from discontinued operations							**4 590**	**– 186**
Net income							**11 737**	**12 614**
Attributable to:								
Shareholders of Novartis AG							*11 732*	*12 611*
Non-controlling interests							*5*	*3*
Included in net income from continuing operations are:								
Interest income							245	292
Depreciation of property, plant and equipment	– 952	– 1 075	– 283	– 285	– 110	– 122	– 1 345	– 1 482
Depreciation of right-of-use assets [1]	– 247		– 41		– 17		– 305	
Amortization of intangible assets	– 2 509	– 2 214	– 315	– 366	– 12	– 7	– 2 836	– 2 587
Impairment charges on property, plant and equipment, net	– 100	– 239	– 101	– 60	– 1	– 2	– 202	– 301
Impairment charges on intangible assets, net	– 632	– 592	– 506	– 249			– 1 138	– 841
Impairment charges and fair value changes on financial assets, net	18	107			20	– 113	38	– 6
Additions to restructuring provisions	– 229	– 395	– 165	– 32	– 98	– 94	– 492	– 521
Equity-based compensation of Novartis equity plans	– 761	– 645	– 67	– 53	– 239	– 220	– 1 067	– 918

[1] Depreciation of right-of-use assets recognized from January 1, 2019, the date of implementation of IFRS 16 Leases. Note 1 provides additional disclosures.

Segmentation – consolidated balance sheets

(USD millions)	Innovative Medicines 2020	Innovative Medicines 2019	Sandoz 2020	Sandoz 2019	Corporate (including eliminations) 2020	Corporate (including eliminations) 2019	Group 2020	Group 2019
Total assets	**83 112**	71 225	**16 825**	16 468	**32 122**	30 677	**132 059**	118 370
Total liabilities	**– 15 472**	– 15 332	**– 3 786**	– 3 804	**– 56 135**	– 43 683	**– 75 393**	– 62 819
Total equity							**56 666**	55 551
Net debt [1]					24 481	15 938	24 481	15 938
Net operating assets	**67 640**	55 893	**13 039**	12 664	**468**	2 932	**81 147**	71 489
Included in assets and liabilities are:								
Total property, plant and equipment	9 863	9 632	1 849	1 888	551	549	12 263	12 069
Additions to property, plant and equipment [2]	926	1 114	229	217	110	143	1 265	1 474
Total right-of-use assets	1 489	1 487	133	136	54	54	1 676	1 677
Additions to right-of-use assets [2]	264	454	67	49	15	34	346	537
Total goodwill and intangible assets	56 839	46 336	9 817	8 892	152	83	66 808	55 311
Additions to goodwill and intangible assets [2]	1 235	647	105	68	85	52	1 425	767
Total investment in associated companies	194	128	8	7	9 430	8 509	9 632	8 644
Additions to investment in associated companies	24	44			7	11	31	55
Cash and cash equivalents, marketable securities, commodities, time deposits and derivative financial instruments					11 563	11 446	11 563	11 446
Financial debts and derivative financial instruments					36 044	27 384	36 044	27 384
Current income tax and deferred tax liabilities					9 880	8 061	9 880	8 061

[1] Note 29 provides additional disclosures related to net debt
[2] Excluding the impact of business acquisitions

The following table shows countries that accounted for more than 5% of at least one of the respective Group totals, as well as regional information for net sales to third parties for the years ended December 31, 2020, 2019 and 2018, and for selected non-current assets for the years ended December 31, 2020 and 2019:

	Net sales[1]						Total of selected non-current assets[2]			
(USD millions)	**2020**	**%**	2019	%	2018	%	**2020**	**%**	2019	%
Country										
Switzerland	800	2	848	2	795	2	34 904	39	33 032	43
United States	16 484	34	16 280	34	14 618	33	39 889	44	28 893	37
France	2 442	5	2 442	5	2 505	6	4 115	5	3 933	5
Germany	4 518	9	4 120	9	3 972	9	2 607	3	2 554	3
Japan	2 804	6	2 656	6	2 575	6	313		309	
China	2 573	5	2 214	5	1 953	4	714	1	684	1
Other	19 038	39	18 885	39	18 333	40	7 837	8	8 296	11
Group	**48 659**	**100**	47 445	100	44 751	100	**90 379**	**100**	77 701	100
Region										
Europe	18 715	38	17 933	38	17 259	39	47 798	53	46 103	59
Americas	19 725	41	19 713	41	18 032	39	40 391	45	29 389	38
Asia/Africa/Australasia	10 219	21	9 799	21	9 460	22	2 190	2	2 209	3
Group	**48 659**	**100**	47 445	100	44 751	100	**90 379**	**100**	77 701	100

[1] Net sales to third party from continuing operations by location of customer
[2] Total of property, plant and equipment; right-of-use assets; goodwill; intangible assets and investment in associated companies

The Group's largest, second-largest and third-largest customers account for approximately 17%, 11% and 6% of net sales, respectively (2019: 18%, 13% and 8%, respectively; 2018: 18%, 14% and 8%, respectively). All segments had sales to these customers in 2020, 2019 and 2018.

The highest amounts of trade receivables outstanding were for these same three customers and amounted to approximately 14%, 12% and 6%, respectively, of the trade receivables at December 31, 2020 (2019: 14%, 12% and 7%, respectively).

Segmentation – Net sales by region[1]

	2020 USD m	2019 USD m	Change (2019 to 2020) USD %	2018 USD m	Change (2018 to 2019) USD %
Innovative Medicines					
Europe	13 484	12 818	5	12 296	4
US	14 342	13 789	4	11 864	16
Asia/Africa/Australasia	8 718	8 458	3	8 097	4
Canada and Latin America	2 469	2 649	– 7	2 635	1
Total	**39 013**	**37 714**	**3**	**34 892**	**8**
Of which in Established Markets	29 643	28 573	4	26 258	9
Of which in Emerging Growth Markets	9 370	9 141	3	8 634	6
Sandoz					
Europe	5 231	5 115	2	4 963	3
US	2 142	2 491	– 14	2 754	– 10
Asia/Africa/Australasia	1 501	1 341	12	1 363	– 2
Canada and Latin America	772	784	– 2	779	1
Total	**9 646**	**9 731**	**– 1**	**9 859**	**– 1**
Of which in Established Markets	7 089	7 111	0	7 233	– 2
Of which in Emerging Growth Markets	2 557	2 620	– 2	2 626	0
Group					
Europe	18 715	17 933	4	17 259	4
US	16 484	16 280	1	14 618	11
Asia/Africa/Australasia	10 219	9 799	4	9 460	4
Canada and Latin America	3 241	3 433	– 6	3 414	1
Total	**48 659**	**47 445**	**3**	**44 751**	**6**
Of which in Established Markets	36 732	35 684	3	33 491	7
Of which in Emerging Growth Markets	11 927	11 761	1	11 260	4

[1] Net sales to third parties from continuing operations by location of customer. Emerging Growth Markets comprise all markets other than the Established Markets of the US, Canada, Western Europe, Japan, Australia and New Zealand.

Innovative Medicines Division net sales by business franchise

	2020 USD m	2019 USD m	Change (2019 to 2020) USD %	2018 USD m	Change (2018 to 2019) USD %
Oncology					
Tasigna	1 958	1 880	4	1 874	0
Promacta/Revolade	1 738	1 416	23	1 174	21
Tafinlar + Mekinist	1 542	1 338	15	1 155	16
Sandostatin	1 439	1 585	– 9	1 587	0
Jakavi	1 339	1 114	20	977	14
Gleevec/Glivec	1 188	1 263	– 6	1 561	– 19
Afinitor/Votubia	1 083	1 539	– 30	1 556	– 1
Kisqali	687	480	43	235	104
Exjade/Jadenu	653	975	– 33	1 099	– 11
Votrient	635	755	– 16	828	– 9
Kymriah	474	278	71	76	nm
Lutathera	445	441	1	167	164
Piqray	320	116	176		nm
Adakveo	105	1	nm		nm
Tabrecta	35		nm		nm
Other	1 070	1 189	– 10	1 139	4
Total Novartis Oncology business unit	**14 711**	**14 370**	**2**	**13 428**	**7**
Immunology, Hepatology and Dermatology					
Cosentyx	3 995	3 551	13	2 837	25
Ilaris	873	671	30	554	21
Other				1	nm
Total Immunology, Hepatology and Dermatology	**4 868**	**4 222**	**15**	**3 392**	**24**
Ophthalmology					
Lucentis	1 933	2 086	– 7	2 046	2
Xiidra	376	192	96		nm
Beovu	190	35	nm		nm
Other	1 911	2 463	– 22	1 995	23
Total Ophthalmology	**4 410**	**4 776**	**– 8**	**4 558**	**5**
Neuroscience					
Gilenya	3 003	3 223	– 7	3 341	– 4
Zolgensma	920	361	155		nm
Mayzent	170	26	nm		nm
Aimovig	164	103	59	8	nm
Kesimpta	15		nm		nm
Other	51	60	– 15	80	– 25
Total Neuroscience	**4 323**	**3 773**	**15**	**3 429**	**10**

	2020 USD m	2019 USD m	Change (2019 to 2020) USD %	2018 USD m	Change (2018 to 2019) USD %
Cardiovascular, Renal and Metabolism					
Entresto	2 497	1 726	45	1 028	68
Other	1	24	– 96	22	9
Total Cardiovascular, Renal and Metabolism	**2 498**	**1 750**	**43**	**1 050**	**67**
Respiratory					
Xolair [1]	1 251	1 173	7	1 039	13
Ultibro Group	623	630	– 1	703	– 10
Other	26	22	18	25	– 12
Total Respiratory	**1 900**	**1 825**	**4**	**1 767**	**3**
Established Medicines					
Galvus Group	1 199	1 297	– 8	1 284	1
Diovan Group	1 003	1 064	– 6	1 023	4
Exforge Group	980	1 025	– 4	1 002	2
Zortress/Certican	452	485	– 7	464	5
Neoral/Sandimmun(e)	393	419	– 6	463	– 10
Voltaren/Cataflam	360	417	– 14	445	– 6
Other	1 916	2 291	– 16	2 587	– 11
Total Established Medicines	**6 303**	**6 998**	**– 10**	**7 268**	**– 4**
Total Novartis Pharmaceuticals business unit	**24 302**	**23 344**	**4**	**21 464**	**9**
Total division net sales	**39 013**	**37 714**	**3**	**34 892**	**8**

[1] Net sales reflect *Xolair* sales for all indications.

nm = not meaningful

Top 20 Innovative Medicines Division product net sales – 2020

Brands	Business franchise	Key indication	US USD m	Rest of world USD m	Total USD m
Cosentyx	Immunology, Hepatology and Dermatology	Psoriasis, ankylosing spondylitis, psoriatic arthritis and non-radiographic axial spondyloarthritis	2 516	1 479	**3 995**
Gilenya	Neuroscience	Relapsing multiple sclerosis	1 562	1 441	**3 003**
Entresto	Cardiovascular, Renal and Metabolism	Chronic heart failure	1 277	1 220	**2 497**
Tasigna	Oncology	Chronic myeloid leukemia	859	1 099	**1 958**
Lucentis	Ophthalmology	Age-related macular degeneration		1 933	**1 933**
Promacta/Revolade	Oncology	Immune thrombocytopenia (ITP), severe aplastic anemia (SAA)	833	905	**1 738**
Tafinlar + Mekinist	Oncology	BRAF V600+ metastatic and adjuvant melanoma; advanced non-small cell lung cancer (NSCLC)	569	973	**1 542**
Sandostatin	Oncology	Carcinoid tumors and acromegaly	837	602	**1 439**
Jakavi	Oncology	Myelofibrosis (MF), polycythemia vera (PV)		1 339	**1 339**
Xolair [1]	Respiratory	Severe allergic asthma (SAA) and chronic spontaneous urticaria (CSU) and nasal polyps		1 251	**1 251**
Galvus Group	Established Medicines	Type 2 diabetes		1 199	**1 199**
Gleevec/Glivec	Oncology	Chronic myeloid leukemia and GIST	315	873	**1 188**
Afinitor/Votubia	Oncology	Breast cancer/TSC	644	439	**1 083**
Diovan Group	Established Medicines	Hypertension	124	879	**1 003**
Exforge Group	Established Medicines	Hypertension	16	964	**980**
Zolgensma	Neuroscience	Spinal muscular atrophy (SMA)	459	461	**920**
Ilaris	Immunology, Hepatology and Dermatology	Auto-inflammatory (CAPS, TRAPS, HIDS/MKD, FMF, SJIA, AOSD and gout)	400	473	**873**
Kisqali	Oncology	HR+/HER2- metastatic breast cancer	318	369	**687**
Exjade/Jadenu	Oncology	Chronic iron overload	138	515	**653**
Votrient	Oncology	Renal cell carcinoma	259	376	**635**
Top 20 products total			**11 126**	**18 790**	**29 916**
Rest of portfolio			3 216	5 881	**9 097**
Total division sales			**14 342**	**24 671**	**39 013**

[1] Net sales reflect *Xolair* sales for all indications.

Top 20 Innovative Medicines Division product net sales – 2019

Brands	Business franchise	Key indication	US USD m	Rest of world USD m	Total USD m
Cosentyx	Immunology, Hepatology and Dermatology	Psoriasis, ankylosing spondylitis and psoriatic arthritis	2 220	1 331	**3 551**
Gilenya	Neuroscience	Relapsing multiple sclerosis	1 736	1 487	**3 223**
Lucentis	Ophthalmology	Age-related macular degeneration		2 086	**2 086**
Tasigna	Oncology	Chronic myeloid leukemia	804	1 076	**1 880**
Entresto	Cardiovascular, Renal and Metabolism	Chronic heart failure	925	801	**1 726**
Sandostatin	Oncology	Carcinoid tumors and acromegaly	881	704	**1 585**
Afinitor/Votubia	Oncology	Breast cancer/TSC	1 003	536	**1 539**
Promacta/Revolade	Oncology	Immune thrombocytopenia (ITP), severe aplastic anemia (SAA)	691	725	**1 416**
Tafinlar + Mekinist	Oncology	BRAF V600+ metastatic and adjuvant melanoma; advanced non-small cell lung cancer (NSCLC)	481	857	**1 338**
Galvus Group	Established Medicines	Type 2 diabetes		1 297	**1 297**
Gleevec/Glivec	Oncology	Chronic myeloid leukemia and GIST	334	929	**1 263**
Xolair [1]	Respiratory	Severe allergic asthma (SAA) and chronic spontaneous urticaria (CSU)		1 173	**1 173**
Jakavi	Oncology	Myelofibrosis (MF), polycythemia vera (PV)		1 114	**1 114**
Diovan Group	Established Medicines	Hypertension	86	978	**1 064**
Exforge Group	Established Medicines	Hypertension	13	1 012	**1 025**
Exjade/Jadenu	Oncology	Chronic iron overload	450	525	**975**
Votrient	Oncology	Renal cell carcinoma	332	423	**755**
Ilaris	Immunology, Hepatology and Dermatology	Auto-inflammatory (CAPS, TRAPS, HIDS/MKD, FMF, SJIA, AOSD and gout)	304	367	**671**
Zortress/Certican	Established Medicines	Transplantation	169	316	**485**
Kisqali	Oncology	HR+/HER2- metastatic breast cancer	250	230	**480**
Top 20 products total			**10 679**	**17 967**	**28 646**
Rest of portfolio			3 110	5 958	**9 068**
Total division sales			**13 789**	**23 925**	**37 714**

[1] Net sales reflect *Xolair* sales for all indications.

Top 20 Innovative Medicines Division product net sales – 2018

Brands	Business franchise	Key indication	US USD m	Rest of world USD m	Total USD m
Gilenya	Neuroscience	Relapsing multiple sclerosis	1 765	1 576	**3 341**
Cosentyx	Immunology, Hepatology and Dermatology	Psoriasis, ankylosing spondylitis and psoriatic arthritis	1 674	1 163	**2 837**
Lucentis	Ophthalmology	Age-related macular degeneration		2 046	**2 046**
Tasigna	Oncology	Chronic myeloid leukemia	806	1 068	**1 874**
Sandostatin	Oncology	Carcinoid tumors and acromegaly	817	770	**1 587**
Gleevec/Glivec	Oncology	Chronic myeloid leukemia and GIST	440	1 121	**1 561**
Afinitor/Votubia	Oncology	Breast cancer/TSC	929	627	**1 556**
Galvus Group	Established Medicines	Type 2 diabetes		1 284	**1 284**
Promacta/Revolade	Oncology	Immune thrombocytopenia (ITP), severe aplastic anemia (SAA)	581	593	**1 174**
Tafinlar + Mekinist	Oncology	BRAF V600+ metastatic and adjuvant melanoma; advanced non-small cell lung cancer (NSCLC)	457	698	**1 155**
Exjade/Jadenu	Oncology	Chronic iron overload	521	578	**1 099**
Xolair [1]	Respiratory	Severe allergic asthma (SAA) and chronic spontaneous urticaria (CSU)		1 039	**1 039**
Entresto	Cardiovascular, Renal and Metabolism	Chronic heart failure	556	472	**1 028**
Diovan Group	Established Medicines	Hypertension	84	939	**1 023**
Exforge Group	Established Medicines	Hypertension	19	983	**1 002**
Jakavi	Oncology	Myelofibrosis (MF), polycythemia vera (PV)		977	**977**
Votrient	Oncology	Renal cell carcinoma	404	424	**828**
Ilaris	Immunology, Hepatology and Dermatology	Auto-inflammatory (CAPS, TRAPS, HIDS/MKD, FMF, SJIA, AOSD and gout)	262	292	**554**
Travoprost Group	Ophthalmology	Reduction of elevated intraocular pressure	194	323	**517**
Zortress/Certican	Established Medicines	Transplantation	145	319	**464**
Top 20 products total			**9 654**	**17 292**	**26 946**
Rest of portfolio			2 210	5 736	**7 946**
Total division sales			**11 864**	**23 028**	**34 892**

[1] Net sales reflect *Xolair* sales for all indications.

Sandoz Division net sales by business franchise

	2020 USD m	2019 USD m	Change (2019 to 2020) USD %	2018 USD m	Change (2018 to 2019) USD %
Retail Generics [1]	7 244	7 590	– 5	7 880	– 4
Biopharmaceuticals	1 928	1 607	20	1 436	12
Anti-Infectives	474	534	– 11	543	– 2
Total division net sales	**9 646**	**9 731**	**– 1**	**9 859**	**– 1**

[1] Of which USD 694 million (2019: USD 784 million; 2018: USD 826 million) represents anti-infectives sold under the Sandoz name

The product portfolio of Sandoz is widely spread in 2020, 2019 and 2018.

Segmentation – other revenue

	Innovative Medicines		Sandoz		Corporate (including eliminations)		Group	
(USD millions)	**2020**	2019	**2020**	2019	**2020**	2019	**2020**	2019
Profit-sharing income	835	732		2			835	734
Royalty income	107	104	25	19	168	24	300	147
Milestone income	39	201	11	30			50	231
Other [1]	37	55	17	12			54	67
Total other revenues	**1 018**	**1 092**	**53**	**63**	**168**	**24**	**1 239**	**1 179**

[1] Other includes revenue from activities such as manufacturing or other services rendered, to the extent such revenue is not recorded under net sales.

	Innovative Medicines		Sandoz		Corporate (including eliminations)		Group	
(USD millions)	2019	2018	2019	2018	2019	2018	2019	2018
Profit-sharing income	732	874	2	3			734	877
Royalty income	104	162	19	10	24	16	147	188
Milestone income	201	128	30	45			231	173
Other [1]	55	24	12	4			67	28
Total other revenues	**1 092**	**1 188**	**63**	**62**	**24**	**16**	**1 179**	**1 266**

[1] Other includes revenue from activities such as manufacturing or other services rendered, to the extent such revenue is not recorded under net sales.

4. Associated companies

	Net income statement effect			Other comprehensive income effect			Total comprehensive income effect		
(USD millions)	**2020**	2019	2018	**2020**	2019	2018[1]	**2020**	2019	2018
Roche Holding AG, Switzerland	677	662	526	– 56	– 94	75	621	568	601
GlaxoSmithKline Consumer Healthcare Holdings Ltd., UK			5 910			– 557			5 353
Others	– 4	– 3	2				– 4	– 3	2
Associated companies related to continuing operations	**673**	**659**	**6 438**	**– 56**	**– 94**	**– 482**	**617**	**565**	**5 956**

[1] In 2018, Novartis share of other comprehensive income recognized by associated companies, net of taxes of USD 511 million was recycled into the consolidated income statement as a result of the divestment of the investment in GSK Consumer Healthcare Holdings Ltd. No Novartis share of other comprehensive income recognized by associated companies, net of taxes was recycled into the consolidated income statement in 2020 and 2019.

Novartis has a significant investment in Roche Holding AG, Basel (Roche), as well as certain other smaller investments that are accounted for as associated companies. The investment in GlaxoSmithKline Consumer Healthcare Holdings Ltd., Brentford, Middlesex, UK, was divested on June 1, 2018, to GlaxoSmithKline plc, Great Britain.

	Balance sheet value	
(USD millions)	**December 31, 2020**	December 31, 2019
Roche Holding AG, Switzerland	9 407	8 445
Others	225	199
Total	**9 632**	**8 644**

Roche Holding AG

The Group's holding in Roche voting shares was 33.3% at December 31, 2020, 2019 and 2018. This investment represents approximately 6.2% of Roche's total outstanding voting and non-voting equity instruments at December 31, 2020, 2019 and 2018.

Since full-year 2020 financial data for Roche is not available when Novartis produces its consolidated financial results, a survey of analyst estimates is used to estimate the Group's share of Roche's net income. Any differences between these estimates and actual results will be adjusted in the Group's 2021 consolidated financial statements when available.

The following tables show summarized financial information for Roche, including current values of fair value adjustments made at the time of the acquisition of the shares, for the year ended December 31, 2019, and for the six months ended June 30, 2020 (since full-year 2020 data is not yet available):

(CHF billions)	Current assets	Non-current assets	Current liabilities	Non-current liabilities
December 31, 2019	31.3	56.4	24.1	23.1
June 30, 2020	27.7	55.7	22.5	23.1

(CHF billions)	Revenue	Net income	Other comprehensive income	Total comprehensive income
December 31, 2019	63.8	12.3	– 0.9	11.4
June 30, 2020	30.4	7.2	– 0.7	6.5

A purchase price allocation was performed on the basis of publicly available information at the time of acquisition of the investment. The December 31, 2020, balance sheet value allocation is as follows:

(USD millions)	**December 31, 2020**
Novartis share of Roche's estimated net assets	2 585
Novartis share of reappraised intangible assets	117
Implicit Novartis goodwill	3 233
Current value of share in net identifiable assets and goodwill	**5 935**
Accumulated equity accounting adjustments and translation effects less dividends received	3 472
Balance sheet value	**9 407**

The identified intangible assets principally relate to the value of currently marketed products and are amortized on a straight-line basis over their estimated average useful life of 20 years.

In 2020, dividends received from Roche in relation to the distribution of its 2019 net income amounted to USD 487 million (2019: USD 460 million in relation to the distribution of its 2018 net income).

The consolidated income statement effects from applying Novartis accounting principles for this investment in 2020, 2019 and 2018 are as follows:

(USD millions)	**2020**	2019	2018
Novartis share of Roche's estimated current-year consolidated net income	913	910	799
Prior-year adjustment	– 64	– 129	– 125
Amortization of fair value adjustments relating to intangible assets, net of taxes of USD 26 million (2019: USD 24 million; 2018: USD 40 million)	– 172	– 162	– 148
Partial release of deferred tax liability recognized		43	
Net income effect	**677**	**662**	**526**

The publicly quoted market value of the Novartis interest in Roche (SIX symbol: RO) at December 31, 2020, was USD 18.8 billion (2019: USD 16.9 billion).

GlaxoSmithKline Consumer Healthcare Holdings Ltd.

On March 27, 2018, Novartis entered into an agreement with GlaxoSmithKline plc, Great Britain (GSK), to divest its 36.5% stake in GSK Consumer Healthcare Holdings Ltd. (GSK Consumer Healthcare) to GSK for USD 13.0 billion in cash. As a result, Novartis discontinued the use of equity method accounting starting from April 1, 2018. The divestment transaction closed on June 1, 2018, and Novartis realized a pre-tax gain of USD 5.8 billion, recorded in income from associated companies. See Note 2.

GSK Consumer Healthcare was formed in March 2015 via contribution of businesses from both Novartis and GSK.

Until June 1, 2018, Novartis had a 36.5% interest in GSK Consumer Healthcare and had four of 11 seats on the GSK Consumer Healthcare board of directors. Furthermore, Novartis had customary minority rights as well as exit rights at a predefined, market-based pricing mechanism.

The consolidated income statement effects from applying Novartis accounting principles for this investment in 2018 are as follows:

(USD millions)	2018
Novartis share of GSK Consumer Healthcare's estimated current-year consolidated net income	119
Prior-year adjustment	4
Amortization of fair value adjustments relating to intangible assets and inventory, net of taxes of USD 1 million	– 3
Pre-tax gain on divestment of GSK Consumer Healthcare	5 790
Net income effect	**5 910**

5. Interest expense and other financial income and expense

Interest expense

(USD millions)	**2020**	2019	2018
Interest expense	– 708	– 714	– 877
Interest expense on lease liabilities	– 67	– 66	
Expense arising from discounting long-term liabilities and capitalized borrowing costs	– 94	– 70	– 55
Total interest expense from continuing operations	**– 869**	**– 850**	**– 932**

Other financial income and expense

(USD millions)	**2020**	2019	2018
Interest income	91	245	292
Other financial income	18	12	1
Financial expense	– 52	– 52	– 39
Currency result, net	– 135	– 160	– 68
Total other financial income and expense from continuing operations	**– 78**	**45**	**186**

6. Taxes

Income before taxes

(USD millions)	2020	2019	2018
Switzerland	9 786	8 097	11 887
Foreign	92	843	2 208
Income before taxes from continuing operations	**9 878**	**8 940**	**14 095**

Current and deferred income tax expense

(USD millions)	2020	2019	2018
Switzerland	– 932	– 1 186	– 615
Foreign	– 1 168	– 961	– 988
Current income tax expense	**– 2 100**	**– 2 147**	**– 1 603**
Switzerland	– 137	– 93	– 120
Foreign	430	447	428
Deferred tax income	**293**	**354**	**308**
Income tax expense from continuing operations	**– 1 807**	**– 1 793**	**– 1 295**

Analysis of tax rate

Novartis has a substantial business presence in many countries and is therefore subject to different income and expense items that are non-taxable (permanent differences) or are taxed at different rates in those tax jurisdictions. This results in a difference between our applicable tax rate and effective tax rate.

The main elements contributing to the difference between the Group's overall applicable tax rate (which can change each year since it is calculated as the weighted average tax rate based on the pre-tax income of each subsidiary) and the effective tax rate are shown in the following table:

(As a percentage)	2020	2019	2018
Applicable tax rate	13.6	11.7	14.3
Effect of disallowed expenditures	4.6	4.8	1.7
Effect of utilization of tax losses brought forward from prior periods	– 0.3	– 0.1	– 0.1
Effect of income taxed at reduced rates	– 0.3	– 0.7	– 0.4
Effect of income not subject to tax [1]	– 0.7	0.0	– 3.7
Effect of tax credits and allowances	– 2.3	– 2.3	– 2.3
Effect of release of contingent consideration liability	– 0.2	– 0.5	– 0.2
Effect of tax rate change on current and deferred tax assets and liabilities [2]	0.3	– 1.4	– 0.1
Effect of write-off of deferred tax assets [3]	0.2	4.0	0.2
Effect of write-down and reversal of write-down of investments in subsidiaries	– 0.8	– 0.6	0.0
Effect of prior-year items	2.3	2.2	– 0.5
Effect of other items [4]	1.9	3.0	0.3
Effective tax rate for continuing operations	**18.3**	**20.1**	**9.2**

[1] Included in 2018 is the effect of income not subject to tax (-3.7%) arising from the portion of the non-taxable gain on the divestment of the Group's investment in GSK Consumer Healthcare Holdings Ltd. attributable to Switzerland.
[2] 2019 is mainly related to the revaluation of the deferred tax assets and liabilities resulting from the tax reforms enacted in Switzerland in 2019. Refer to Note 12 for additional disclosures.
[3] 2019 is primarily related to a non-cash, one-time deferred tax expense for the write-off of a deferred tax asset resulting from legal entity reorganizations.
[4] In 2020, other items (+1.9%) include changes in uncertain tax positions (+2.0%) and other items (-0.1%).
In 2019, other items (+3.0%) include changes in uncertain tax positions (+2.6%) and other items (+0.4%).

The utilization of tax-loss carry-forwards lowered the tax charge by USD 29 million in 2020, by USD 11 million in 2019, and by USD 19 million in 2018.

For the amount of taxes attributable to discontinued operations, see Note 30.

7. Earnings per share

	2020	2019	2018
Net income attributable to shareholders of Novartis AG (USD millions)			
- Continuing operations	8 072	7 142	12 797
- Discontinued operations		4 590	– 186
Total	**8 072**	**11 732**	**12 611**
Number of shares (in millions)			
Weighted average number of shares outstanding used in basic earnings per share	2 277	2 291	2 319
Adjustment for vesting of restricted shares, restricted share units and dilutive shares from options	19	28	25
Weighted average number of shares in diluted earnings per share	**2 296**	**2 319**	**2 344**
Basic earnings per share (USD)			
- Continuing operations	3.55	3.12	5.52
- Discontinued operations		2.00	– 0.08
Total	**3.55**	**5.12**	**5.44**
Diluted earnings per share (USD)			
- Continuing operations	3.52	3.08	5.46
- Discontinued operations		1.98	– 0.08
Total	**3.52**	**5.06**	**5.38**

Basic earnings per share (EPS) is calculated by dividing net income attributable to shareholders of Novartis AG by the weighted average number of shares outstanding in a reporting period. This calculation excludes the average number of issued shares purchased by the Group and held as treasury shares.

For diluted EPS, the weighted average number of shares outstanding is adjusted to assume the vesting of all restricted shares, restricted share units, and the conversion of all potentially dilutive shares arising from options on Novartis shares that have been issued.

No options were excluded from the calculation of diluted EPS in 2020, 2019 or 2018, as all options were dilutive in all years.

8. Changes in consolidated statements of comprehensive income

The consolidated statements of comprehensive income include the Group's net income for the year as well as all other valuation adjustments recorded in the Group's consolidated balance sheet which under IFRS are not recorded in the consolidated income statement. These include fair value adjustments to financial instruments, actuarial gains or losses on defined benefit pension plans, and currency translation effects, net of tax.

(USD millions)	Note	Fair value adjustments on financial instruments	Actuarial gains/(losses) from defined benefit plans	Cumulative currency translation effects	Total value adjustments attributable to Novartis AG shareholders	Non-controlling interest	Total value adjustments
Value adjustments at December 31, 2017, as previously reported		**395**	**– 5 064**	**329**	**– 4 340**	**– 21**	**– 4 361**
Impact of adoption of IFRS 9 on retained earnings and OCI		– 177			– 177		– 177
Restated value adjustments at January 1, 2018		**218**	**– 5 064**	**329**	**– 4 517**	**– 21**	**– 4 538**
Fair value adjustments on deferred cash flow hedges, net of taxes of USD -1 million		12			12		12
Fair value adjustments on equity securities, net of taxes of USD -5 million [1]		13			13		13
Net investment hedge				95	95		95
Defined benefit plans, net of taxes of USD 69 million			– 359		– 359		– 359
Currency translation effects	8.1			320	320	– 5	315
Total value adjustments in 2018		**25**	**– 359**	**415**	**81**	**– 5**	**76**
Fair value adjustments on equity securities sold, reclassified to retained earnings		– 16			– 16		– 16
Value adjustments at December 31, 2018		**227**	**– 5 423**	**744**	**– 4 452**	**– 26**	**– 4 478**
Fair value adjustments on deferred cash flow hedges		1			1		1
Fair value adjustments on debt securities		1			1		1
Fair value adjustments on equity securities, net of taxes of USD 47 million [1]		– 47			– 47		– 47
Net investment hedge				44	44		44
Defined benefit plans, net of taxes of USD -313 million [2]			– 466		– 466	– 1	– 467
Currency translation effects	8.1			354	354	– 2	352
Total value adjustments in 2019		**– 45**	**– 466**	**398**	**– 113**	**– 3**	**– 116**
Fair value adjustments on equity securities sold, reclassified to retained earnings		– 95			– 95		– 95
Fair value adjustments related to divestments		33	– 30		3		3
Value adjustments at December 31, 2019		**120**	**– 5 919**	**1 142**	**– 4 657**	**– 29**	**– 4 686**
Fair value adjustments on equity securities, net of taxes of USD -36 million [1]		250			250		250
Net investment hedge				– 201	– 201		– 201
Defined benefit plans, net of taxes of USD -3 million			145		145	– 2	143
Currency translation effects	8.1			3 193	3 193	1	3 194
Total value adjustments in 2020		**250**	**145**	**2 992**	**3 387**	**– 1**	**3 386**
Fair value adjustments on equity securities sold, reclassified to retained earnings		– 150			– 150		– 150
Fair value adjustments related to divestments			2		2		2
Impact of change in ownership of consolidated entities			– 1		– 1	1	
Value adjustments at December 31, 2020		**220**	**– 5 773**	**4 134**	**– 1 419**	**– 29**	**– 1 448**

[1] Includes fair value adjustments on equity securities designated as financial assets valued at fair value through other comprehensive income with no subsequent recycling into the consolidated income statement

[2] Included in 2019 is a USD -358 million impact related to the revaluation of deferred tax assets on Swiss post-employment benefits that were previously recognized through other comprehensive income. This revaluation resulted from the Swiss tax reforms enacted by the voters in 2019. Refer to Note 12 for additional disclosures.

8.1) In 2020, no currency translation losses or gains were recycled through the income statement.

In 2019, cumulative currency translation gains of USD 129 million were recycled through the income statement mainly as a result of the spin-off of the Alcon business through a dividend in kind distribution to Novartis AG shareholders. See Notes 2 and 30.

In 2018, cumulative currency translation losses of USD 946 million were recycled through the income statement as a result of the divestment of the investment in GSK Consumer Healthcare Holdings Ltd. See Notes 2 and 4.

9. Property, plant and equipment

The following table summarizes the movements of property, plant and equipment during 2020:

(USD millions)	Land	Buildings	Construction in progress	Machinery and other equipment	Total
Cost					
January 1, 2020	**512**	**11 463**	**1 350**	**13 674**	**26 999**
Cost of assets reclassified out of assets of disposal group held for sale [1]	11	117	36	168	332
Impact of acquisitions of businesses	2	19		5	26
Reclassifications	10	433	– 1 038	595	
Additions	7	115	847	296	1 265
Disposals and derecognitions	– 23	– 465	– 57	– 1 656	– 2 201
Currency translation effects	36	695	110	956	1 797
December 31, 2020	**555**	**12 377**	**1 248**	**14 038**	**28 218**
Accumulated depreciation					
January 1, 2020	**– 20**	**– 5 124**	**– 60**	**– 9 726**	**– 14 930**
Accumulated depreciation on assets reclassified out of assets of disposal group held for sale [1]		– 58	– 4	– 101	– 163
Accumulated depreciation on disposals and derecognitions	17	433	11	1 543	2 004
Depreciation charge [2]		– 491		– 827	– 1 318
Impairment charge	– 15	– 194	– 10	– 228	– 447
Reversal of impairment charge				7	7
Currency translation effects	– 1	– 373	– 3	– 731	– 1 108
December 31, 2020	**– 19**	**– 5 807**	**– 66**	**– 10 063**	**– 15 955**
Net book value at December 31, 2020	**536**	**6 570**	**1 182**	**3 975**	**12 263**
Commitments for purchases of property, plant and equipment					**256**
Capitalized borrowing costs					**2**

[1] Note 2 provides additional disclosures related to the reclassification out of assets of the disposal group held for sale.

[2] Depreciation charge includes USD 38 million (USD 20 million for buildings and USD 18 million for machinery and other equipment), representing the cumulative amount of depreciation charge on the disposal group held for sale for property, plant and equipment from the date of classification to held for sale, September 2018, to March 31, 2020, the date of reclassification out of assets of disposal group held for sale. See Note 2 for further details.

The following table summarizes the movements of property, plant and equipment during 2019:

(USD millions)	Land	Buildings	Construction in progress	Machinery and other equipment	Total
Cost					
January 1, 2019	**696**	**14 135**	**2 042**	**17 155**	**34 028**
Cost of assets related to discontinued operations [1]	– 61	– 1 615	– 655	– 2 678	– 5 009
Reclassification to right-of-use assets [2]	– 122	– 3		– 2	– 127
Cost of assets related to disposal group held for sale [3]		– 3	– 12	– 8	– 23
Impact of acquisitions of businesses	10	24	1	9	44
Reclassifications	57	332	– 1 019	630	
Additions	6	112	1 001	355	1 474
Disposals and derecognitions	– 75	– 1 551	– 9	– 1 774	– 3 409
Currency translation effects	1	32	1	– 13	21
December 31, 2019	**512**	**11 463**	**1 350**	**13 674**	**26 999**
Accumulated depreciation					
January 1, 2019	**– 43**	**– 6 328**	**– 37**	**– 11 924**	**– 18 332**
Accumulated depreciation on assets related to discontinued operations [1]	8	562	7	1 541	2 118
Reclassification to right-of-use assets [2]	26				26
Accumulated depreciation on assets related to disposal group held for sale [3]		2			2
Accumulated depreciation on disposals and derecognitions		1 170	2	1 674	2 846
Depreciation charge [4]		– 447		– 898	– 1 345
Impairment charge [5]	– 10	– 51	– 34	– 110	– 205
Reversal of impairment charge		1	2		3
Currency translation effects	– 1	– 33		– 9	– 43
December 31, 2019	**– 20**	**– 5 124**	**– 60**	**– 9 726**	**– 14 930**
Net book value at December 31, 2019	**492**	**6 339**	**1 290**	**3 948**	**12 069**
Commitments for purchases of property, plant and equipment					**220**
Capitalized borrowing costs					**4**

[1] Represents the cost of assets and accumulated depreciation at January 1, 2019, related to the Alcon business reported as discontinued operations. Notes 1, 2 and 30 provide information related to discontinued operations.
[2] Reclassification to right-of-use assets at January 1, 2019, upon adoption of IFRS 16 Leases. Refer to Note 1 for additional disclosure.
[3] Note 2 provides additional disclosures related to disposal group held for sale.
[4] No depreciation charge in the disposal group held for sale for the period from January 1, 2019, to December 31, 2019, was recorded.
[5] Impairments in the disposal group held for sale for the period from January 1, 2019, to December 31, 2019, were USD 2 million.

10. Right-of-use assets and lease liabilities

The following table summarizes the movements of the right-of-use assets of continuing operations:

(USD millions)	2020	2019
Right-of-use assets at January 1	**1 677**	**1 554**
Impact of acquisitions of businesses	32	
Additions	346	537
Depreciation charge	– 330	– 305
Lease contract terminations [1]	– 63	– 98
Impact of divestments	– 32	– 17
Currency translation effects	46	6
Total right-of-use assets at December 31 [2]	**1 676**	**1 677**

[1] Lease contract terminations also includes modifications to existing leases that result in reductions to the right-of-use assets, and reductions due to sub-leasing.
[2] No impairment charge was recorded in 2020 (2019: nil).

The following table shows the right-of-use assets carrying value and depreciation charge of continuing operations at December 31, 2020 and 2019, by underlying class of asset:

(USD millions)	December 31, 2020 carrying value	Depreciation charge 2020	December 31, 2019 carrying value	Depreciation charge 2019
Land	528	11	537	14
Buildings	963	207	990	194
Vehicles	155	100	129	87
Machinery and equipment, and other assets	30	12	21	10
Total right-of-use assets	**1 676**	**330**	**1 677**	**305**

The following table shows the lease liabilities of continuing operations by maturity at December 31, 2020 and 2019:

(USD millions)	Lease liabilities 2020	Lease liabilities undiscounted 2020	Lease liabilities 2019	Lease liabilities undiscounted 2019
Less than one year	286	338	246	295
Between one and two years	229	274	202	246
Between two and three years	186	226	163	202
Between three and four years	148	183	138	173
Between four and five years	129	160	119	150
After five years	1 027	2 326	1 081	2 419
Total lease liabilities	**2 005**	**3 507**	**1 949**	**3 485**
Less current portion of lease liabilities	– 286	– 338	– 246	– 295
Non-current portion of lease liabilities	**1 719**	**3 169**	**1 703**	**3 190**

At December 31, 2020 and December 31, 2019, there were no material future cash outflows, including extension options, excluded from the measurement of lease liabilities. The Group's most material lease with a lease term extension, representing a lease liability value of USD 0.6 billion (2019: USD 0.6 billion), has a determined lease term end date of 2071 (2019: 2071).

In 2019, the Group completed sale and leaseback transactions for certain property, plant and equipment as part of its plans to consolidate sites. Transactions resulted in net cash inflows of USD 0.7 billion and the recognition of USD 96 million of lease liabilities, and USD 37 million of right-of-use assets. The right-of-use assets value reflects the proportion of the property, plant and equipment retained for a period of one to five years, with two five-year extension periods for certain right-of-use assets. The liabilities reflect the net present value of future lease payments. The net gain on the sale and leaseback transactions amounted to USD 478 million. There were no significant sale and leaseback transactions completed in 2020.

The following table provides additional disclosures related to right-of-use assets and lease liabilities of continuing operations for 2020 and 2019:

(USD millions)	2020	2019
Interest expense on lease liabilities [1]	67	66
Expense on short-term leases	4	7
Expense on low-value leases	7	8
Total cash outflows for leases	379	339
Thereof:		
Cash outflows for short-term leases and low-value leases [2]	*11*	*15*
Payments of interest [3]	*56*	*51*
Payments of lease liabilities [4]	*312*	*273*

[1] The weighted average interest rate is 3.4% (2019: 3.9%).
[2] Cash flows from short-term and low-value leases are included within total net cash flows from operating activities. The portfolio of short-term leases to which the Group is committed to at December 31, 2020 and 2019, is similar to the portfolio of short-term leases the Group entered into during 2020 and 2019.
[3] Included within total net cash flows from operating activities.
[4] Reported as cash outflows used in financing activities net of lease incentives received of USD nil (2019: USD 33 million).

The net investment held and income from subleasing right-of-use assets were not significant for 2020 and 2019. Income from leasing Novartis property, plant and equipment to third parties for both 2020 and 2019 was not significant.

Note 30 provides additional disclosures on discontinued operations.

11. Goodwill and intangible assets

The following table summarizes the movements of goodwill and intangible assets in 2020:

	Goodwill	Intangible assets other than goodwill				
(USD millions)	Total	In-process research and development	Technologies	Currently marketed products	Other intangible assets	Total
Cost						
January 1, 2020	**26 825**	**7 429**	**884**	**43 548**	**1 558**	**53 419**
Cost of assets reclassified out of assets of disposal group held for sale [1]		10	276	1 112	2	1 400
Impact of acquisitions of businesses	2 580	8 600		196	218	9 014
Reclassifications [2]		– 9 272	– 2	9 274		
Additions [3]		339		674	412	1 425
Disposals and derecognitions [4]		– 421	– 101	– 39	– 11	– 572
Currency translation effects	916	208	58	2 568	205	3 039
December 31, 2020	**30 321**	**6 893**	**1 115**	**57 333**	**2 384**	**67 725**
Accumulated amortization						
January 1, 2020	**– 301**	**– 2 005**	**– 721**	**– 20 969**	**– 937**	**– 24 632**
Accumulated amortization on assets reclassified out of assets of disposal group held for sale [1]		– 2	– 107	– 816		– 925
Amortization charge [5]			– 72	– 3 215	– 175	– 3 462
Accumulated amortization on disposals and derecognitions [4]		421	101	39	6	567
Impairment charge [6]		– 515	– 40	– 338	– 21	– 914
Currency translation effects	– 21	– 92	– 46	– 1 267	– 145	– 1 550
December 31, 2020	**– 322**	**– 2 193**	**– 885**	**– 26 566**	**– 1 272**	**– 30 916**
Net book value at December 31, 2020	**29 999**	**4 700**	**230**	**30 767**	**1 112**	**36 809**

[1] Note 2 provides additional disclosures related to the reclassification out of assets of disposal group held for sale as of March 31, 2020.
[2] Reclassifications between various asset categories as a result of product launches of acquired in-process research and development and completion of software development
[3] No addition for the disposal group held for sale for the period from January 1, 2020, to March 31, 2020
[4] Derecognition of assets that are no longer being used or developed and are not considered to have a significant disposal value or other alternative use
[5] Amortization charge includes USD 102 million (USD 73 million for currently marketed products and USD 29 million for technologies), representing the cumulative amount of amortization charge for the disposal group held for sale for intangible assets from the date of reclassification to held for sale, September 6, 2018, to March 31, 2020, the date of reclassification out of assets of disposal group held for sale. See Note 2 for further details.
[6] Impairment charge includes USD 42 million on currently marketed products that were previously classified within assets of disposal group held for sale. See Note 2 for further details.

The following table summarizes the movements of goodwill and intangible assets in 2019:

	Goodwill	Intangible assets other than goodwill						
(USD millions)	Total	In-process research and development	Alcon brand name	Technologies	Currently marketed products	Marketing know-how	Other intangible assets	Total
Cost								
January 1, 2019	**35 700**	**16 167**	**2 980**	**6 253**	**35 412**	**5 960**	**2 253**	**69 025**
Cost of assets related to discontinued operations [1]	– 9 000	– 249	– 2 980	– 5 369	– 4 440	– 5 960	– 572	– 19 570
Cost of assets related to disposal group held for sale, net [2]		– 1			4			3
Impact of acquisitions of businesses	186	342			3 550		22	3 914
Reclassifications [3]		– 9 069			9 069			
Additions [4]		265			243		259	767
Disposals and derecognitions [5]		– 75			– 544		– 436	– 1 055
Currency translation effects	– 61	49			254		32	335
December 31, 2019	**26 825**	**7 429**		**884**	**43 548**		**1 558**	**53 419**
Accumulated amortization								
January 1, 2019	**– 406**	**– 1 120**		**– 4 758**	**– 21 218**	**– 1 906**	**– 1 304**	**– 30 306**
Accumulated amortization on assets related to discontinued operations [1]	101	3		4 184	2 592	1 906	128	8 813
Amortization charge [6]				– 42	– 2 657		– 137	– 2 836
Accumulated amortization on disposals and derecognitions [5]		70			494		419	983
Impairment charge [6]		– 984		– 105	– 54		– 32	– 1 175
Reversal of impairment charge		37						37
Currency translation effects	4	– 11			– 126		– 11	– 148
December 31, 2019	**– 301**	**– 2 005**		**– 721**	**– 20 969**		**– 937**	**– 24 632**
Net book value at December 31, 2019	**26 524**	**5 424**		**163**	**22 579**		**621**	**28 787**

[1] Represents the cost of assets and accumulated amortization at January 1, 2019, related to the Alcon business reported as discontinued operations. Notes 1, 2 and 30 provide information related to discontinued operations.
[2] Note 2 provides additional disclosures related to assets of disposal group held for sale.
[3] Reclassifications between various asset categories as a result of product launches of acquired in-process research and development and completion of software development
[4] No addition in the disposal group held for sale for the period from January 1, 2019, to December 31, 2019
[5] Derecognition of assets that are no longer being used or developed and are not considered to have a significant disposal value or other alternative use
[6] No amortization or impairment charges related to the disposal group held for sale for the period from January 1, 2019, to December 31, 2019.

The following table summarizes the allocation of the net book values of goodwill and intangible assets by reporting segment at December 31, 2020:

	Goodwill	Intangible assets other than goodwill				
(USD millions)	Total	In-process research and development	Technologies	Currently marketed products	Other intangible assets	Total
Innovative Medicines	21 718	4 548	3	29 645	925	35 121
Sandoz	8 274	152	227	1 122	42	1 543
Corporate	7				145	145
Net book value at December 31, 2020	**29 999**	**4 700**	**230**	**30 767**	**1 112**	**36 809**

The following table summarizes the allocation of the net book values of goodwill and intangible assets by reporting segment at December 31, 2019:

	Goodwill	Intangible assets other than goodwill				
(USD millions)	Total	In-process research and development	Technologies	Currently marketed products	Other intangible assets	Total
Innovative Medicines	18 750	5 339	7	21 720	520	27 586
Sandoz	7 767	85	156	859	25	1 125
Corporate	7				76	76
Net book value at December 31, 2019	**26 524**	**5 424**	**163**	**22 579**	**621**	**28 787**

The Innovative Medicines and Sandoz Divisions' cash-generating units, to which goodwill is allocated, each comprise a group of smaller cash-generating units. The valuation method of the recoverable amount of the cash-generating units, to which goodwill is allocated, is based on the fair value less costs of disposal.

The following assumptions are used in the calculations:

(As a percentage)	Innovative Medicines	Sandoz
Terminal growth rate	1.5	1.5
Discount rate (post-tax)	6.5	6.5

The discount rates for all divisions consider the Group's weighted average cost of capital, adjusted to approximate the weighted average cost of capital of a comparable market participant.

The fair value less costs of disposal, for all cash-generating units containing goodwill, is reviewed for the impact of reasonably possible changes in key assumptions. In particular, we considered an increase in the discount rate, a decrease in the terminal growth rate, and certain negative impacts on the forecasted cash flows. These reasonably possible changes in key assumptions did not indicate an impairment.

"Note 1. Significant accounting policies—Impairment of goodwill and intangible assets" provides additional disclosures on how the Group performs goodwill and intangible asset impairment testing.

The following table shows the intangible asset and goodwill impairment charges for continuing operations for 2020, 2019 and 2018:

(USD millions)	**2020**	2019	2018
Innovative Medicines [1]	– 768	– 669	– 592
Sandoz [2]	– 141	– 506	– 249
Corporate	– 5		
Total	**– 914**	**– 1 175**	**– 841**

[1] 2020 includes an impairment of USD 485 million related to the write-down of IPR&D related to cessation of clinical development program ZPL389 for atopic dermatitis and USD 181 million related to a partial write-down of the *Votrient* currently marketed product.
2019 includes an impairment of USD 416 million related to the write-down of IPR&D related to cessation of clinical development program EMA401 and a USD 108 million write-down related to the cessation of clinical development program for MOR106 for atopic dermatitis.
2018 includes an impairment of USD 400 million related to a partial write-down of the *Votrient* currently marketed product.

[2] 2019 includes an impairment of USD 442 million related to the write-down of IPR&D related to the discontinuation of the generic Advair® development program.
2018 includes impairments of USD 220 million related to the write-down of the allocated goodwill (USD 183 million) and the currently marketed products (USD 37 million) related to the retained Sandoz US dermatology business and generic US oral solids portfolio. See Note 2.

In 2020, there were no reversals of prior-year impairment charges (2019: USD 37 million; 2018: nil).

Note 30 provides additional disclosures on discontinued operations.

12. Deferred tax assets and liabilities

(USD millions)	Property, plant and equipment	Intangible assets	Pensions and other benefit obligations of associates	Inventories	Tax loss carry-forwards	Other assets, provisions and accruals	Total
Gross deferred tax assets at January 1, 2020	**108**	**1 469**	**1 078**	**2 446**	**255**	**2 596**	**7 952**
Gross deferred tax liabilities at January 1, 2020	**– 390**	**– 3 610**	**– 291**	**– 287**	**– 7**	**– 1 325**	**– 5 910**
Net deferred tax balance at January 1, 2020	**– 282**	**– 2 141**	**787**	**2 159**	**248**	**1 271**	**2 042**
At January 1, 2020	**– 282**	**– 2 141**	**787**	**2 159**	**248**	**1 271**	**2 042**
Credited/(charged) to income	89	110	– 25	212	– 164	71	293
Charged to equity						9	9
Charged to other comprehensive income			– 3			– 36	– 39
Impact of acquisitions of businesses	5	– 1 945		– 3	408	34	– 1 501
Other movements	– 53	58	38	– 25	5	– 35	– 12
Net deferred tax balance at December 31, 2020	**– 241**	**– 3 918**	**797**	**2 343**	**497**	**1 314**	**792**
Gross deferred tax assets at December 31, 2020	189	1 351	1 137	2 502	507	2 658	8 344
Gross deferred tax liabilities at December 31, 2020	– 430	– 5 269	– 340	– 159	– 10	– 1 344	– 7 552
Net deferred tax balance at December 31, 2020	**– 241**	**– 3 918**	**797**	**2 343**	**497**	**1 314**	**792**
After offsetting the following amount of deferred tax assets and liabilities within the same tax jurisdiction, the balance amounts to:							130
Deferred tax assets at December 31, 2020							8 214
Deferred tax liabilities at December 31, 2020							– 7 422
Net deferred tax balance at December 31, 2020							**792**
Gross deferred tax assets at January 1, 2019	**191**	**1 233**	**1 188**	**3 722**	**273**	**2 175**	**8 782**
Gross deferred tax liabilities at January 1, 2019	**– 622**	**– 5 384**	**– 273**	**– 474**		**– 805**	**– 7 558**
Net deferred tax balance at January 1, 2019	**– 431**	**– 4 151**	**915**	**3 248**	**273**	**1 370**	**1 224**
At January 1, 2019	**– 431**	**– 4 151**	**915**	**3 248**	**273**	**1 370**	**1 224**
Net deferred tax balance related to discontinued operations [1]	82	1 403	– 123	– 248	– 39	– 217	858
Credited/(charged) to income	74	605	308	– 818	– 113	298	354
Charged to equity		8			75	– 166	– 83
Charged to other comprehensive income			– 313			24	– 289
Impact of acquisitions of businesses	3	– 45			21	– 26	– 47
Other movements	– 10	39		– 23	31	– 12	25
Net deferred tax balance at December 31, 2019	**– 282**	**– 2 141**	**787**	**2 159**	**248**	**1 271**	**2 042**
Gross deferred tax assets at December 31, 2019	108	1 469	1 078	2 446	255	2 596	7 952
Gross deferred tax liabilities at December 31, 2019	– 390	– 3 610	– 291	– 287	– 7	– 1 325	– 5 910
Net deferred tax balance at December 31, 2019	**– 282**	**– 2 141**	**787**	**2 159**	**248**	**1 271**	**2 042**
After offsetting the following amount of deferred tax assets and liabilities within the same tax jurisdiction, the balance amounts to:							43
Deferred tax assets at December 31, 2019							7 909
Deferred tax liabilities at December 31, 2019							– 5 867
Net deferred tax balance at December 31, 2019							**2 042**

[1] Notes 1, 2 and 30 provide information related to discontinued operations.

The following table presents deferred tax assets and deferred tax liabilities, which are expected to have an impact on current taxes payable after more than 12 months:

(USD billions)	**2020**	2019
Expected to have an impact on current tax payable after more than 12 months		
– Deferred tax assets	4.5	4.3
– Deferred tax liabilities	7.0	5.2

Deferred tax liabilities have not been recognized for the withholding tax and other taxes that would be payable on the remittance of earnings of foreign subsidiaries, as the Group has the ability to control any future reversal and the unremitted earnings are retained in the foreign subsidiaries for reinvestment. The total unremitted earnings retained for reinvestment in the Group's foreign subsidiaries that would be subject to withholding tax or other taxes if remitted to the Group are estimated at approximately USD 27 billion in 2020 (2019: USD 26 billion).

Temporary differences on which no deferred tax has been provided as they are permanent in nature related to:

(USD billions)	**2020**	2019
Investments in subsidiaries	5	3
Goodwill from acquisitions	– 27	– 24

The gross value of tax-loss carry-forwards that have or have not been capitalized as deferred tax assets, with their expiry dates, is as follows:

(USD millions)	Not capitalized	Capitalized	**2020 total**
One year	20		20
Two years	1	5	6
Three years	2	6	8
Four years	23		23
Five years	11	40	51
More than five years [1]	3 400	2 291	5 691
Not subject to expiry	323	683	1 006
Total	**3 780**	**3 025**	**6 805**

[1] Not capitalized more than five years includes USD 3.2 billion attributable to US state tax-loss carry-forwards, of which USD 1.6 billion relates to The Medicines Company, which was acquired in 2020 (see Note 2).

(USD millions)	Not capitalized	Capitalized	2019 total
One year	14	0	14
Two years	28	0	28
Three years	28	6	34
Four years	16	46	62
Five years	127	37	164
More than five years	125	2 214	2 339
Not subject to expiry	310	35	345
Total	**648**	**2 338**	**2 986**

(USD millions)	**2020**	2019	2018
Tax losses carried forward that expired	14	9	8

Deferred tax assets related to taxable losses of relevant Group entities are recognized to the extent it is considered probable that future taxable profits will be available against which such losses can be utilized in the foreseeable future.

The Basel-Stadt cantonal tax reform was approved by voters in February 2019, with parts of the reform retroactively enacted per January 1, 2019. The newly enacted tax rate resulted in a decrease of the blended cantonal and federal tax rate from 22% to 13%. This change impacted the Group's Basel-Stadt-domiciled operating subsidiaries.

The Swiss federal tax reform was approved by voters in May 2019. The enactment of the Swiss federal tax reform required the abolishment of the holding company tax regimes as of January 1, 2020. As a result, the holding company tax rate increased from the current 8% to 13%, effective January 1, 2020.

The enactment of these Swiss tax reforms required a revaluation of the deferred tax assets and liabilities to the newly enacted tax rates at the date of enactment.

The following table shows the impact on the revaluation of deferred assets and liabilities in 2019, as at the respective dates of the enactment of the Swiss tax reforms:

(USD millions)	Income statement continuing operations	Equity	**Total**
Deferred tax asset and liability revaluation			
Items previously recognized in consolidated income statement	234		234
Items previously recognized in other comprehensive income [1]		– 358	– 358
Total revaluation of deferred tax assets and liabilities	234	– 358	– 124

[1] Related to post-employment benefits

13. Financial and other non-current assets

Financial assets

(USD millions)	2020	2019
Equity securities	1 577	1 524
Debt securities	36	33
Fund investments	366	233
Total financial investments	**1 979**	**1 790**
Long-term receivables from finance subleases	83	66
Other long-term receivables	125	104
Contingent consideration receivables [1]	625	399
Long-term loans, advances and security deposits	89	159
Total financial assets	**2 901**	**2 518**

[1] Note 29 provides additional disclosures related to contingent considerations.

Other non-current assets

(USD millions)	2020	2019
Deferred compensation plans	471	414
Prepaid post-employment benefit plans	202	148
Other non-current assets	219	176
Total other non-current assets	**892**	**738**

14. Inventories

(USD millions)	2020	2019
Raw material, consumables	967	751
Work in progress	3 324	3 024
Finished products	2 840	2 207
Total inventories	**7 131**	**5 982**

The following table shows the amount of inventory recognized as an expense in “Cost of goods sold” in the consolidated income statements from continuing operations:

(USD billions)	2020	2019	2018
Cost of goods sold	– 8.5	– 8.5	– 8.3

The following table shows the recognized amount of inventory provision and reversals of inventory provision recorded in the consolidated income statements from continuing operations:

(USD millions)	2020	2019	2018
Inventory provisions	– 702	– 752	– 603
Reversals of inventory provisions	255	218	216

The reversals mainly result from the release of products initially requiring additional quality control inspections and from the reassessment of inventory values manufactured prior to regulatory approval but for which approval was subsequently received.

15. Trade receivables

(USD millions)	2020	2019
Total gross trade receivables	8 310	8 396
Provisions for doubtful trade receivables	– 93	– 95
Total trade receivables, net	**8 217**	**8 301**

The following table summarizes the movement in the provision for doubtful trade receivables:

(USD millions)	2020	2019	2018
January 1	**– 95**	**– 126**	**– 190**
Provisions related to discontinued operations [1]		54	
Impact of acquisitions of businesses			– 1
Provisions for doubtful trade receivables charged to the consolidated income statement [2]	– 59	– 89	– 47
Utilization of provisions for doubtful trade receivables	13	12	39
Reversal of provisions for doubtful trade receivables credited to the consolidated income statement [3]	53	53	61
Currency translation effects	– 5	1	12
December 31	**– 93**	**– 95**	**– 126**

[1] Notes 1, 2 and 30 provide information related to discontinued operations.
[2] Provisions charged to the consolidated income statement from continuing operations were USD 30 million in 2018.
[3] Reversal of provisions credited to the consolidated income statement from continuing operations were USD 44 million in 2018.

The following table shows the trade receivables that are not overdue as specified in the payment terms and conditions established with Novartis customers, as well as an analysis of overdue amounts and related provisions for doubtful trade receivables:

(USD millions)	2020	2019
Not overdue	7 714	7 763
Past due for not more than one month	150	161
Past due for more than one month but less than three months	118	123
Past due for more than three months but less than six months	102	103
Past due for more than six months but less than one year	77	96
Past due for more than one year	149	150
Provisions for doubtful trade receivables	– 93	– 95
Total trade receivables, net	**8 217**	**8 301**

Trade receivable balances represent amounts due from our customers, which are mainly drug wholesalers, retailers, private health systems, government agencies, managed care providers, pharmacy benefit managers and government-supported healthcare systems. Novartis continues to monitor sovereign debt issues and economic conditions in the countries in which it operates, particularly in Argentina, Brazil, Greece, Italy, Portugal, Russia, Saudi Arabia, Spain and Turkey, and evaluates trade receivables in these countries for potential collection risks. The majority of the outstanding trade receivables from Portugal, Saudi Arabia, Spain and Greece are due directly from local governments or from government-funded entities. Deteriorating credit and economic conditions as well as other factors in these closely monitored countries have resulted in, and may continue to result in, an increase in the average length of time that it takes to collect these trade receivables, and may require the Group to re-evaluate the expected credit loss amount of these trade receivables in future periods.

The following table shows the gross trade receivables balance from these closely monitored countries at December 31, 2020 and 2019; the amounts that are past due for more than one year; and the related provisions that have been recorded:

(USD millions)	2020	2019
Total balance of gross trade receivables from closely monitored countries	1 505	1 588
Past due for more than one year	55	61
Provisions	27	24

At December 31, 2020, amounts past due for more than one year are not significant in any of these countries on a standalone basis.

Total trade receivables include amounts denominated in the following major currencies:

(USD millions)	2020	2019
US dollar (USD)	3 311	3 466
Euro (EUR)	1 668	1 384
Japanese yen (JPY)	437	466
Russian ruble (RUB)	288	341
Chinese yuan (CNY)	208	279
British pound (GBP)	191	202
Australian dollar (AUD)	153	125
Brazilian real (BRL)	148	165
Canadian dollar (CAD)	125	129
Swiss franc (CHF)	124	89
Other currencies	1 564	1 655
Total trade receivables, net	**8 217**	**8 301**

16. Marketable securities, commodities, time deposits, derivative financial instruments, and cash and cash equivalents

Marketable securities, commodities, time deposits and derivative financial instruments

(USD millions)	2020	2019
Marketable securities	26	61
Commodities	111	110
Time deposits and short-term investments with original maturity more than 90 days	1 609	61
Derivative financial instruments	159	102
Total marketable securities, commodities, time deposits and derivative financial instruments	**1 905**	**334**

Cash and cash equivalents

(USD millions)	2020	2019
Current accounts	3 750	3 247
Time deposits and short-term investments with original maturity less than 90 days	5 908	7 865
Total cash and cash equivalents	**9 658**	**11 112**

17. Other current assets

(USD millions)	2020	2019
VAT receivable	544	508
Withholding tax recoverable	73	108
Prepaid expenses	943	898
Receivables from associated companies		1
Other receivables and current assets	963	1 165
Total other current assets	**2 523**	**2 680**

18. Equity

The following table shows the movement in the share capital:

(USD millions)	Jan 1, 2018	Movement in year	Dec 31, 2018	Movement in year	Dec 31, 2019	Movement in year	Dec 31, 2020
Share capital	969	– 25	944	– 8	936	– 23	913
Treasury shares	– 100	31	– 69	– 11	– 80	27	– 53
Outstanding share capital	**869**	**6**	**875**	**– 19**	**856**	**4**	**860**

The following table shows the movement in the shares:

Number of outstanding shares (in millions)	Note	2020 Total Novartis shares	2020 Total treasury shares[1]	2020 Total outstanding shares	2019 Total Novartis shares	2019 Total treasury shares[1]	2019 Total outstanding shares	2018 Total Novartis shares	2018 Total treasury shares[1]	2018 Total outstanding shares
Balance at beginning of year		**2 527.3**	**– 262.3**	**2 265.0**	**2 550.6**	**– 239.4**	**2 311.2**	**2 616.8**	**– 299.3**	**2 317.5**
Shares canceled for capital reduction[2]		– 60.3	60.3		– 23.3	23.3		– 66.2	66.2	
Shares acquired to be canceled[3]			– 32.6	– 32.6		– 60.3	– 60.3		– 23.3	– 23.3
Other share purchases[4]			– 1.7	– 1.7		– 1.7	– 1.7		– 1.2	– 1.2
Exercise of options and employee transactions[5]	18.9		14.7	14.7		5.5	5.5		7.8	7.8
Equity-based compensation[5]			11.0	11.0		9.4	9.4		7.4	7.4
Shares delivered to Alcon employees			0.4	0.4		0.9	0.9			
Other share sales									3.0	3.0
Total movements		**– 60.3**	**52.1**	**– 8.2**	**– 23.3**	**– 22.9**	**– 46.2**	**– 66.2**	**59.9**	**– 6.3**
Balance at end of year		**2 467.0**	**– 210.2**	**2 256.8**	**2 527.3**	**– 262.3**	**2 265.0**	**2 550.6**	**– 239.4**	**2 311.2**

[1] Approximately 103.0 million treasury shares (2019: 117.6 million; 2018: 121.6 million) are held in Novartis entities that restrict their availability for use.
[2] Novartis reduced its share capital by canceling shares that were repurchased on the SIX Swiss Exchange second trading line during previous years.
[3] Shares repurchased on the SIX Swiss Exchange second trading line under a CHF 10 billion share buyback authority approved at the 2016 Annual General Meeting (AGM) for transactions before February 28, 2019, and under a new CHF 10 billion share buyback authority approved at the 2019 AGM for transactions after such date
[4] Shares acquired from employees, which were previously granted to them under the respective equity-based participation plans
[5] Shares delivered as a result of options being exercised and physical share deliveries related to equity-based participation plans.

18.1) The amount available for distribution as a dividend to shareholders is based on the available distributable retained earnings of Novartis AG determined in accordance with the legal provisions of the Swiss Code of Obligations.

	2020	2019	2018
Dividend per share (in CHF)	2.95	2.85	2.80
Total dividend payment (in USD billion)	7.0	6.6	7.0

18.2) The following table summarizes the treasury shares movements:

	Note	2020 Number of outstanding shares (in millions)	2020 Equity impact USD m	2019 Number of outstanding shares (in millions)	2019 Equity impact USD m	2018 Number of outstanding shares (in millions)	2018 Equity impact USD m
Shares acquired to be canceled[1]		– 32.6	– 2 897	– 60.3	– 5 351	– 23.3	– 1 859
Other share purchases[2]		– 1.7	– 159	– 1.7	– 160	– 1.2	– 114
Purchase of treasury shares		– 34.3	– 3 056	– 62.0	– 5 511	– 24.5	– 1 973
Exercise of options and employee transactions[3]	18.9	14.7	806	5.5	210	7.8	434
Equity-based compensation[4]		11.0	730	9.4	833	7.4	756
Shares delivered to Alcon employees		0.4	30	0.9	18		
Other share sales						3.0	263
Total		**– 8.2**	**– 1 490**	**– 46.2**	**– 4 450**	**– 6.3**	**– 520**

[1] Shares repurchased on the SIX Swiss Exchange second trading line under a CHF 10 billion share buyback authority approved at the 2016 AGM for transactions before February 28, 2019, and under a new CHF 10 billion share buyback authority approved at the 2019 AGM for transactions after such date
[2] Shares acquired from employees, which were previously granted to them under the respective equity-based participation plans
[3] Shares delivered as a result of options being exercised related to equity-based participation plans and the delivery of treasury shares. The average share price of the shares delivered was significantly below market price, reflecting the strike price of the options exercised.
[4] Equity-settled share-based compensation is expensed in the consolidated income statement in accordance with the vesting period of the share-based compensation plans. The value for the shares and options granted is credited to consolidated equity over the respective vesting period. In addition, tax benefits arising from tax-deductible amounts exceeding the expense recognized in the income statement are credited to equity.

18.3) In November 2020, Novartis entered into an irrevocable, non-discretionary arrangement with a bank to repurchase Novartis shares on the second trading line under its up-to USD 2.5 billion share buyback. Novartis is able to cancel this arrangement at any time but could be subject to a 90-day waiting period. The commitment under this arrangement therefore reflects the obligated purchases by the bank under such trading plan over a rolling 90-day period, or if shorter, until the maturity date of such trading plan.

The commitment under this arrangement amounted to USD 1.8 billion as of December 31, 2020.

In August 2020, Novartis entered into an irrevocable, non-discretionary arrangement with a bank to repurchase Novartis shares to mitigate dilution related to participation plans of associates. Novartis was able to cancel this arrangement at any time but would have been subjected to a 90-day waiting period.

This trading plan commitment was fully executed and expired, and as a consequence, there is no contingent liability related to this plan recognized as of December 31, 2020.

In 2019, Novartis entered into a similar irrevocable, non-discretionary arrangement with a bank to repurchase Novartis shares on the second trading line under its up-to USD 5 billion share buyback and to repurchase Novartis shares to mitigate dilution related to participation plans of associates. The commitment under this arrangement therefore reflects the obligated purchases by the bank under such trading plan over a rolling 90-day period, or if shorter, until the maturity date of such trading plan.

The trading plan commitment was fully executed and expired, and as a consequence, there is no contingent liability related to this plan recognized as of December 31, 2019.

In 2018, Novartis entered into a similar irrevocable, non-discretionary arrangements with a bank to repurchase Novartis shares. The commitments under this arrangement reflected the expected purchases by the bank under such trading plan over a rolling 90-day period.

The commitment under this arrangement amounted to USD 284 million as of December 31, 2018.

18.4) In October 2020, Novartis entered into an agreement with the market maker for its employee options to repurchase a portion of the outstanding written call options. A total of 3.7 million options were repurchased under this agreement. This agreement was terminated in November 2020.

18.5) The impact of change in ownership of consolidated entities represents the excess of the amount paid to non-controlling interest over their carrying value and equity allocation to non-controlling interest due to change in ownership percentage.

18.6) Changes in non-controlling interests represent the impact on the non-controlling interest of transactions with minority shareholders, such as change in ownership percentage, dividend payments and other equity transactions.

18.7) Other movements includes, for subsidiaries in hyperinflationary economies, the impact of the restatement of the non-monetary assets and liabilities with the general price index at the beginning of the period as well as the restatement of the equity balances of the current year. In 2020, the amount recorded in equity related to hyperinflation accounting was USD 18 million (2019: USD 22 million; 2018: USD 38 million). See Note 29 for additional disclosures.

18.8) In 2019, transaction costs of USD 253 million (2018: USD 79 million) net of tax of USD 36 million (2018: USD 20 million), that are directly attributable to the distribution (spin-off) of Alcon Inc. to Novartis shareholders and that would otherwise have been avoided, were recorded as a deduction from equity. See Note 1 for further details. No transaction costs were recorded as a deduction from equity in 2020.

18.9) At December 31, 2020, the market maker held 1 million (2019: 13 million; 2018: 11 million) written call options, originally issued as part of the share-based compensation for associates, that have not yet been exercised. The weighted average exercise price of these options is USD 60.09 (2019: USD 63.90; 2018: USD 62.70), and they have contractual lives of 10 years, with remaining lives up to three years (2019: four years; 2018: five years).

In December 2018, Novartis entered into an agreement with the market maker for its employee options to repurchase a portion of the outstanding written call options that are not exercised in exchange for treasury shares. During 2019, this agreement was fully executed.

19. Non-current financial debt

(USD millions)	2020	2019
Straight bonds	28 298	22 167
Liabilities to banks and other financial institutions [1]	233	188
Total, including current portion of non-current financial debt	**28 531**	**22 355**
Less current portion of non-current financial debt	– 2 272	– 2 002
Total non-current financial debt	**26 259**	**20 353**

[1] Average interest rate 0.3% (2019: 0.2%)

All bonds are initially recorded at the amount of proceeds received, net of transaction costs. They are subsequently carried at amortized cost, with the difference between the proceeds, net of transaction costs, and the amount due on redemption being recognized as a charge to the consolidated income statement over the period of the relevant bond. Financial debts, including current financial debts, contain only general default covenants. The Group is in compliance with these covenants.

The percentage of fixed-rate financial debt to total financial debt was 79% at December 31, 2020, and 82% at December 31, 2019.

The average interest rate on total financial debt in 2020 was 2.0% (2019: 2.4%).

Note 29 contains a maturity table of the Group's future contractual interest payments commitments.

The following table provides a breakdown of straight bonds:

Coupon	Currency	Nominal amount (millions)	Issuance year	Maturity year	Issuer	Issue price	2020 (USD millions)	2019 (USD millions)
4.400%	USD	1 000	2010	2020	Novartis Capital Corporation, New York, United States	99.237%		1 000
2.400%	USD	1 500	2012	2022	Novartis Capital Corporation, New York, United States	99.225%	1 497	1 495
3.700%	USD	500	2012	2042	Novartis Capital Corporation, New York, United States	98.325%	490	489
3.400%	USD	2 150	2014	2024	Novartis Capital Corporation, New York, United States	99.287%	2 142	2 139
4.400%	USD	1 850	2014	2044	Novartis Capital Corporation, New York, United States	99.196%	1 826	1 825
0.750%	EUR	600	2014	2021	Novartis Finance S.A., Luxembourg, Luxembourg	99.134%	737	670
1.625%	EUR	600	2014	2026	Novartis Finance S.A., Luxembourg, Luxembourg	99.697%	735	670
0.250%	CHF	500	2015	2025	Novartis AG, Basel, Switzerland	100.640%	568	517
0.625%	CHF	550	2015	2029	Novartis AG, Basel, Switzerland	100.502%	625	568
1.050%	CHF	325	2015	2035	Novartis AG, Basel, Switzerland	100.479%	369	336
3.000%	USD	1 750	2015	2025	Novartis Capital Corporation, New York, United States	99.010%	1 737	1 735
4.000%	USD	1 250	2015	2045	Novartis Capital Corporation, New York, United States	98.029%	1 220	1 219
0.125%	EUR	1 250	2016	2023	Novartis Finance S.A., Luxembourg, Luxembourg	99.127%	1 530	1 392
0.625%	EUR	500	2016	2028	Novartis Finance S.A., Luxembourg, Luxembourg	98.480%	607	553
1.800%	USD	1 000	2017	2020	Novartis Capital Corporation, New York, United States	99.609%		1 000
2.400%	USD	1 000	2017	2022	Novartis Capital Corporation, New York, United States	99.449%	998	996
3.100%	USD	1 000	2017	2027	Novartis Capital Corporation, New York, United States	99.109%	992	990
0.000%	EUR	1 250	2017	2021	Novartis Finance S.A., Luxembourg, Luxembourg	99.133%	1 536	1 396
1.125%	EUR	600	2017	2027	Novartis Finance S.A., Luxembourg, Luxembourg	99.874%	735	670
0.500%	EUR	750	2018	2023	Novartis Finance S.A., Luxembourg, Luxembourg	99.655%	919	837
1.375%	EUR	750	2018	2030	Novartis Finance S.A., Luxembourg, Luxembourg	99.957%	920	838
1.700%	EUR	750	2018	2038	Novartis Finance S.A., Luxembourg, Luxembourg	99.217%	913	832
1.750%	USD	1 000	2020	2025	Novartis Capital Corporation, New York, United States	99.852%	996	
2.000%	USD	1 250	2020	2027	Novartis Capital Corporation, New York, United States	99.909%	1 245	
2.200%	USD	1 500	2020	2030	Novartis Capital Corporation, New York, United States	99.869%	1 493	
2.750%	USD	1 250	2020	2050	Novartis Capital Corporation, New York, United States	97.712%	1 213	
0.000% [1]	EUR	1 850	2020	2028	Novartis Finance S.A., Luxembourg, Luxembourg	99.354%	2 255	
Total straight bonds							**28 298**	**22 167**

[1] The EUR 1 850 million bond issued in 2020 features a coupon step-up of 0.25% commencing with the first interest payment date after December 31, 2025, if one or both of the 2025 Patient Access Targets are not met. These 2025 Patient Access Targets are the 2025 Flagship Programs Patient Reach Target and the 2025 Strategic Innovative Therapies Patient Reach Target, as defined in the bond prospectus. As of December 31, 2020, there is no indication that these 2025 Patient Access Targets will not be met.

The following tables provide a breakdown of total non-current financial debt, including current portion by maturity and currency:

Breakdown by maturity:

(USD millions)	2020	2019
2020		2 002
2021	2 272	2 067
2022	2 631	2 583
2023	2 546	2 321
2024	2 142	2 139
2025	3 302	2 252
After 2025	15 638	8 991
Total	**28 531**	**22 355**

Breakdown by currency:

(USD millions)	2020	2019
US dollar (USD)	15 848	12 889
Euro (EUR)	10 888	7 861
Japanese yen (JPY)	194	184
Swiss franc (CHF)	1 563	1 421
Others	38	
Total	**28 531**	**22 355**

The following table shows the comparison of balance sheet and fair value of total non-current financial debt, including current portion:

(USD millions)	2020 Balance sheet	2020 Fair values	2019 Balance sheet	2019 Fair values
Straight bonds	28 298	31 359	22 167	23 701
Others	233	233	188	188
Total	**28 531**	**31 592**	**22 355**	**23 889**

The fair values of straight bonds are determined by quoted market prices. Other financial debts are recorded at notional amounts, which are a reasonable approximation of the fair values.

20. Provisions and other non-current liabilities

(USD millions)	2020	2019
Accrued liability for employee benefits:		
Defined benefit pension plans [1]	3 538	3 469
Other long-term employee benefits and deferred compensation	637	546
Other post-employment benefits [1]	543	612
Environmental remediation provisions	642	592
Provisions for product liabilities, governmental investigations and other legal matters	181	200
Contingent consideration [2]	984	958
Other non-current liabilities	409	255
Total provisions and other non-current liabilities	**6 934**	**6 632**

[1] Note 25 provides additional disclosures related to post-employment benefits.
[2] Note 29 provides additional disclosures related to contingent consideration.

Novartis believes that its total provisions are adequate based upon currently available information. However, given the inherent difficulties in estimating liabilities in this area, Novartis may incur additional costs beyond the amounts provided. Management believes that such additional amounts, if any, would not be material to the Group's financial condition but could be material to the results of operations or cash flows in a given period.

Environmental remediation provisions

The following table shows the movements in the environmental liability provisions:

(USD millions)	2020	2019	2018
January 1	**714**	**692**	**761**
Cash payments	– 10	– 30	– 48
Releases [1]	– 27	– 83	– 21
Additions [2]	82	124	7
Currency translation effects	50	11	– 7
December 31	**809**	**714**	**692**
Less current provision	– 167	– 122	– 58
Non-current environmental remediation provisions at December 31	**642**	**592**	**634**

[1] Releases of provisions credited to the consolidated income statement from continuing operations were USD 21 million in 2018.
[2] Additions to provisions charged to the consolidated income statement from continuing operations were USD 7 million in 2018.

The material components of the environmental remediation provisions consist of costs to sufficiently clean and refurbish contaminated sites to the extent necessary and to continue surveillance at sites where the environmental remediation exposure is less significant.

A substantial portion of the environmental remediation provisions relate to the remediation of Basel regional landfills in the adjacent border areas in Switzerland, Germany and France. The provisions are reassessed on a yearly basis and adjusted as necessary.

In the United States, Novartis has been named under federal legislation (the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended) as a potentially responsible party (PRP) in respect of certain sites. Novartis actively participates in, or monitors, the cleanup activities at the sites in which it is a PRP. The provision takes into consideration the number of other PRPs at each site as well as the identity and financial position of such parties in light of the joint and several nature of the liability.

The expected timing of the related cash outflows as of December 31, 2020, is currently projected as follows:

(USD millions)	Expected cash outflows
Due within two years	181
Due later than two years, but within five years	210
Due later than five years, but within 10 years	338
Due after 10 years	80
Total environmental remediation liability provisions	**809**

Provisions for product liabilities, governmental investigations and other legal matters

Novartis has established provisions for certain product liabilities, governmental investigations and other legal matters where a potential cash outflow is probable and Novartis can make a reliable estimate of the amount of the outflow. These provisions represent the Group's current best estimate of the total financial effect for the matters described below and for other less significant matters. Potential cash outflows reflected in a provision might be fully or partially offset by insurance in certain circumstances.

Novartis has not established provisions for potential damage awards for certain additional legal claims against its subsidiaries if Novartis currently believes that a payment is either not probable or cannot be reliably estimated. In total, these not-provisioned-for matters include more than 3 000 individual product liability cases and certain other legal matters. Plaintiffs' alleged claims in these matters, which Novartis does not believe to be entirely remote but which do not fulfill the conditions for the establishment of provisions, currently aggregate to, according to the current best belief of Novartis, approximately USD 0.5 billion. In addition, in some of these matters there are claims for punitive or multiple (treble) damages, civil penalties and disgorgement of profits that in the view of Novartis are either wholly or partially unspecified, or wholly or partially unquantifiable at present; the Group believes that information about these amounts claimed by plaintiffs generally is not meaningful for purposes of determining a reliable estimate of a loss that is probable or more than remote.

A number of other legal matters are in such early stages or the issues presented are such that the Group has not made any provisions since it cannot currently estimate either a potential outcome or the amount of any potential losses. For these reasons, among others, the Group generally is unable to make a reliable estimate of possible loss with respect to such cases. It is therefore not practicable to provide information about the potential financial impact of those cases.

There might also be cases for which the Group was able to make a reliable estimate of the possible loss or the range of possible loss, but the Group believes that publication of such information on a case-by-case basis would seriously prejudice the Group's position in ongoing legal proceedings or in any related settlement discussions. Accordingly, in such cases, information has been disclosed with respect to the nature of the contingency, but no disclosure is provided as to an estimate of the possible loss or range of possible loss.

Note 28 contains additional information on contingencies.

Summary of significant legal proceedings

The following is a summary of significant legal proceedings to which Novartis or its subsidiaries are currently a party, or were a party and that concluded in 2020.

Investigations and related litigations

Southern District of New York (S.D.N.Y.) Gilenya marketing practices investigation and litigation

In 2013, Novartis Pharmaceuticals Corporation (NPC) received a civil investigative demand from the United States Attorney's Office (USAO) for the S.D.N.Y. requesting the production of documents and information relating to marketing practices for *Gilenya*, including the

remuneration of healthcare providers in connection therewith. In 2017, the S.D.N.Y. and New York State declined to intervene in claims raised by an individual relator in a *qui tam* complaint, which continue to be vigorously contested.

Government generic pricing antitrust investigations, antitrust class actions

Since 2016, Sandoz Inc. has received a grand jury subpoena and a civil investigative demand and interrogatories from the Antitrust and Civil Divisions of the US Department of Justice (DOJ), and a subpoena and interrogatories from the Attorney General of the State of Connecticut in connection with those agencies' investigation into alleged price fixing and market allocation of generic drugs in the US market as well as alleged federal False Claims Act (FCA) violations. In 2020, Sandoz Inc. reached a resolution with the DOJ Antitrust Division, pursuant to which Sandoz Inc. agreed to pay USD 195 million and entered into a deferred prosecution agreement. The Sandoz resolution related to instances of misconduct at the company between 2013 and 2015 with regard to certain generic drugs sold in the United States. Under the terms of that agreement, Sandoz Inc. will continue to take steps to enhance its compliance program, employee training and monitoring, and will continue to cooperate with the US government's ongoing investigation into the generic pharmaceutical industry. Sandoz Inc. is also in negotiations with the DOJ Civil Division to resolve potential related claims and has recorded a provision of USD 187 million.

Since the third quarter of 2016, Sandoz Inc. and Fougera Pharmaceuticals Inc. have been sued alongside other generic pharmaceutical companies in numerous individual and putative class action complaints by direct and indirect private purchasers and by 54 states and US territories, represented by their respective Attorneys General. Plaintiffs claim that defendants, including Sandoz, engaged in price fixing and market allocation of generic drugs in the US market, and seek damages and injunctive relief. The actions contain product-specific complaints as well as complaints alleging the existence of an overarching industry conspiracy, and assert violations of federal and state antitrust laws as well as consumer protection laws. The cases have been consolidated for pretrial purposes in the United States District Court (USDC) for the Eastern District of Pennsylvania, and the claims are being vigorously contested.

Lucentis/Avastin® matters

In connection with an investigation into whether Novartis entities, F. Hoffmann-La Roche AG, Genentech Inc. and Roche S.p.A. colluded to artificially preserve the market positions of Avastin® and *Lucentis*, in 2014 the Italian Competition Authority (ICA) imposed a fine equivalent to USD 125 million on the Novartis entities. Novartis paid the fine, subject to the right to later claim recoupment, and appealed before the Consiglio di Stato (CdS). In 2014 and 2015, the Italian Ministry of Health and the Lombardia region sent letters with payment requests for a total equivalent of approximately USD 1.3 billion in damages from Novartis and Roche entities based on these allegations. In 2019, the CdS upheld the ICA decision and fine. Following the CdS decision, several additional Italian regions and hospitals sent letters claiming damages for an aggregate amount of approximately USD 330 million. None of these claims has been asserted in legal proceedings. Novartis continues to appeal the CdS decision. In 2019, the French Competition Authority (FCA) issued a Statement of Objections against Novartis entities, alleging anti-competitive practices on the French market for anti-vascular endothelial growth factor treatments for wet age-related macular degeneration from 2008 to 2013. In 2020, the FCA issued a decision finding that the Novartis entities had infringed competition law by abusing a dominant position and imposing a fine of EUR 385 million (equivalent to approximately USD 452 million). Novartis paid the fine, again subject to recoupment, and is appealing the FCA's decision. Novartis continues to vigorously contest all claims in Italy and France. Novartis is also challenging policies and regulations allowing off-label/unlicensed use and reimbursement for economic reasons in various countries, including Italy and Turkey.

Japan investigation

In 2015, a trial started against a former Novartis Pharma K.K. (NPKK) employee, and also against NPKK under the dual liability concept in Japanese law, over allegations brought by the Tokyo District Public Prosecutor Office for alleged manipulation of data in sub-analysis publications of the Kyoto Heart Study regarding valsartan. The charges against NPKK are subject to a maximum total fine of JPY 4 million. In 2018, the Tokyo High Court upheld a not-guilty ruling of the Tokyo District Court for both the former NPKK employee and NPKK. A further appeal by the Tokyo High Public Prosecutor Office remains pending.

South Korea investigation

In 2016, the Seoul Western District Prosecutor initiated a criminal investigation into, among other things, allegations that Novartis Korea utilized medical journals to provide inappropriate economic benefits to healthcare professionals (HCPs). This resulted in a non-material fine in January 2020, and the Prosecutor has appealed the fine. The resolution of inquiries by the DOJ and the US Securities and Exchange Commission (SEC) regarding this matter is described below in "Concluded legal matters – US Government Foreign Corrupt Practices Act (FCPA) investigations."

Greece investigation

Novartis is providing information to the Greek authorities investigating allegations of potentially inappropriate economic benefits to HCPs, government officials and others in Greece. These authorities include the Greek Coordinating Body for Inspection and Control, and the Greek Body of Prosecution of Financial Crime, from which the Company received a summons in 2018 and 2020. The resolution of inquiries by the DOJ and the SEC regarding this matter is described below in "Concluded legal matters – US Government Foreign Corrupt Practices Act (FCPA) investigations."

Antitrust class actions

Exforge

Since 2018, Novartis Group companies as well as other pharmaceutical companies have been sued by various direct and indirect purchasers of *Exforge* in multiple US individual and putative class action complaints. They claim that Novartis made a reverse payment in the form of an agreement not to launch an authorized generic, alleging violations of federal antitrust law and state antitrust, consumer protection and common laws, and seeking damages as well as injunctive relief. The cases have been consolidated in the S.D.N.Y. and the claims are being vigorously contested.

Product liability litigation

Reclast

NPC is a defendant in more than 20 US product liability actions involving *Reclast* and alleging atypical femur fracture injuries, all of which are in New Jersey state or federal court and in California state court, coordinated with claims against other bisphosphonate manufacturers. The claims are being vigorously contested.

Taxotere® (docetaxel)

Sandoz is a defendant in more than 3 000 US product liability actions involving Taxotere® (docetaxel), an oncology product, many of which have been transferred to a multidistrict litigation in the Eastern District of Louisiana. The complaints allege misleading marketing and that Sanofi, as innovator, and several 505(b)(2) NDA holders (including Sandoz) failed to warn of the risk of permanent alopecia/hair loss. The claims are being vigorously contested.

Amiodarone

Sandoz entities are named in less than five individual and multi-plaintiff US product liability cases involving amiodarone, a cardiac drug indicated to treat life-threatening arrhythmias that have not responded to other treatment. The complaints allege failure to warn, off-label promotion and failure to include medication guides to pharmacies. The claims are being vigorously contested.

Sartans and ranitidine

Since 2018, claims have been brought against Sandoz and other pharmaceutical companies alleging injury from carcinogenic impurities found in valsartan and valsartan/HCT film-coated tablets and/or losartan marketed or manufactured by Sandoz. These claims include several putative class actions in Canada. Claims have also been brought alleging injury from carcinogenic impurities in ranitidine-containing medicines. These claims also include several putative class actions in Canada and a multidistrict litigation in Florida. All of these claims are being vigorously contested.

Tasigna

NPC is a defendant in more than 80 US product liability actions involving *Tasigna*, alleging that the product caused various cardiovascular effects and that NPC failed to provide adequate warnings about those alleged side effects. The actions are pending in New Jersey state court and in federal courts in various jurisdictions. The claims are being vigorously contested.

Other matters

Average Wholesale Price (AWP) litigation

Lawsuits have been brought, the latest in February 2016, by various US state governmental entities and private parties against various pharmaceutical companies, including NPC, alleging that they fraudulently overstated the AWP that is or has been used by payors, including state Medicaid agencies, to calculate reimbursements to healthcare providers. NPC remains a defendant in a putative class action brought by private payors in New Jersey, and vigorously contests those claims.

Aimovig–Amgen dispute

In 2015 and 2017, Novartis and Amgen entered into agreements regarding the development and commercialization of *Aimovig*, which the companies co-commercialize in the US and to which Novartis has exclusive rights in all territories outside the US, excluding Japan. Amgen issued a termination notice in April 2019 based on an alleged material breach of the collaboration agreements, and this notice, as well as other ancillary matters, are the subject of legal proceedings between Novartis and Amgen. Novartis disputes Amgen's allegations vigorously. In 2020, the court ruled that Amgen did not have grounds to terminate the 2017 agreement and dismissed that portion of their lawsuit. The collaboration continues during the litigation between the companies, and will remain in force until and unless a final court decision terminates the agreements.

Shareholder Derivative Lawsuit

In 2021, NPC, Sandoz Inc., Novartis Capital Corporation and certain present and former directors and officers of Novartis were named as defendants, and Novartis was named as a nominal defendant, in a purported shareholder derivative lawsuit filed in New York state court. The plaintiff, derivatively as a purported Novartis shareholder on behalf of Novartis, seeks damages and other remedies based on alleged conduct by the corporate and individual defendants. The claims are being vigorously contested.

Concluded legal matters

S.D.N.Y. marketing practices investigation and litigation

In 2013, the US government filed a civil complaint in intervention to an individual *qui tam* action against NPC in the USDC for the S.D.N.Y. The complaint, as subsequently amended, asserted federal FCA and common law claims with respect to speaker programs and other promotional activities for certain NPC cardiovascular medications (*Lotrel*, *Starlix* and *Valturna*) allegedly serving as mechanisms to provide kickbacks to HCPs. Also in 2013, New York State filed a civil complaint in intervention asserting similar claims. In 2020, Novartis finalized its settlement agreement with the S.D.N.Y, the New York State Attorney General and the individual relator to resolve their claims. As part of this settlement, Novartis agreed to pay USD 0.7 billion, and has agreed to new corporate integrity obligations with the Office of Inspector General of the US Department of Health and Human Services.

U.S. Government Foreign Corrupt Practices Act (FCPA) investigations

In 2020, Novartis reached settlements with the DOJ and the SEC resolving all FCPA investigations into historical conduct by Novartis and its subsidiaries. These investigations were previously disclosed in Note 20 to the Consolidated Financial Statements in our 2019 Annual Report and 2019 Form 20-F under the headings "Investigations and related litigations – Greece investigation," "Investigations and related litigations – South Korea investigation" and "Investigations and related litigations – Asia/Russia investigation." As part of the coordinated resolution of these investigations, Novartis and certain of its current and former subsidiaries agreed to pay USD 0.3 billion. To resolve the DOJ investigation, both Novartis Hellas S.A.C.I. and Alcon Pte Ltd., a former Novartis subsidiary, entered into separate deferred prosecution agreements (DPA) with the DOJ. The Novartis Hellas DPA contained no allegations relating to any bribery of Greek politicians, which is consistent with what Novartis found in its own internal investigation. To resolve the SEC investigation, Novartis AG reached an agreement pertaining to internal controls and books and records violations in Greece, Vietnam and South Korea, which also addressed certain internal controls and books and records issues related to Alcon China's placement of surgical devices. Other developments in Greece and South Korea are described above in "Investigations and related litigations – Greece investigation" and "Investigations and related litigations – South Korea investigation," respectively. The matters disclosed in Note 20 to the Consolidated Financial Statements in our 2019 Annual Report and 2019 Form 20-F under the heading "Investigations and related litigations – Asia/Russia investigation" are now concluded.

Enoxaparin

In 2015, Sandoz and Momenta Pharmaceuticals were sued in a putative antitrust class action in federal court in Tennessee alleging that Momenta and Sandoz engaged in anticompetitive and unfair business conduct with regard to sales of enoxaparin. In 2019, Sandoz agreed to pay USD 85 million to resolve the class action. The matter is now concluded.

Summary of product liability, governmental investigations and other legal matters provision movements

(USD millions)	2020	2019	2018
January 1	**1 369**	**340**	**351**
Provisions related to discontinued operations [1]		– 42	
Impact of acquisitions of businesses	11	10	
Cash payments	– 1 863	– 116	– 118
Releases of provisions [2]	– 31	– 52	– 107
Additions to provisions [3]	1 018	1 230	220
Currency translation effects	– 17	– 1	– 6
December 31	**487**	**1 369**	**340**
Less current portion	– 306	– 1 169	– 126
Non-current product liabilities, governmental investigations and other legal matters provisions at December 31	**181**	**200**	**214**

[1] Notes 1, 2 and 30 provide information related to discontinued operations.
[2] Releases of provisions credited to the consolidated income statement from continuing operations were USD 107 million in 2018.
[3] Additions to provisions charged to the consolidated income statement from continuing operations were USD 220 million in 2018.

Novartis believes that its total provisions for investigations, product liability, arbitration and other legal matters are adequate based upon currently available information. However, given the inherent difficulties in estimating liabilities, there can be no assurance that additional liabilities and costs will not be incurred beyond the amounts provided.

21. Current financial debt and derivative financial instruments

(USD millions)	2020	2019
Interest-bearing accounts of associates payable on demand [1]	2 085	1 836
Bank and other financial debt [2]	976	719
Commercial paper	4 258	2 289
Current portion of non-current financial debt	2 272	2 002
Derivative financial instruments	194	185
Total current financial debt and derivative financial instruments	**9 785**	**7 031**

[1] Weighted average interest rate 0.4% (2019: 0.5%)
[2] Weighted average interest rate 5.0% (2019: 12.9%)

The consolidated balance sheet amounts of current financial debt, other than the current portion of non-current financial debt, approximate the estimated fair value due to the short-term nature of these instruments.

Details on commercial papers and short term borrowings are provided under "Liquidity risk" in Note 29.

22. Provisions and other current liabilities

(USD millions)	2020	2019
Taxes other than income taxes	749	471
Restructuring provisions	459	438
Accrued expenses for goods and services received but not invoiced	1 167	1 046
Accruals for royalties	732	653
Accrued interests on financial debt	133	98
Provisions for deductions from revenue	6 256	5 595
Accruals for compensation and benefits, including social security	2 286	2 464
Environmental remediation liabilities	167	122
Deferred income	56	114
Provisions for product liabilities, governmental investigations and other legal matters [1]	306	1 169
Accrued share-based payments	269	326
Contingent considerations [2]	62	78
Commitment for repurchase of own shares [3]	1 769	
Other payables	716	764
Total provisions and other current liabilities	**15 127**	**13 338**

[1] Note 20 provides additional disclosures related to legal provisions.
[2] Note 29 provides additional disclosures related to contingent considerations.
[3] Note 18 provides additional disclosures related to commitment for repurchase of own shares.

Provisions are based upon management's best estimate and adjusted for actual experience. Such adjustments to historic estimates have not been material.

Provisions for deductions from revenue

The following table shows the movement of the provisions for deductions from revenue:

(USD millions)	Revenue deductions provisions at January 1	Revenue deductions provisions related to discontinued operations[1]	Effect of currency translation and business combinations	Payments/ utilizations	Income statement charge[2] Adjustments of prior years	Income statement charge[2] Current year	Change in provisions offset against gross trade receivables	Revenue deductions provisions at December 31
2020								
US-specific healthcare plans and program rebates	1 981			– 5 560	– 107	5 739		2 053
Non-US-specific healthcare plans and program rebates	1 769		167	– 2 597	7	2 940	– 14	2 272
Non-healthcare plans and program-related rebates, returns and other deductions	1 845		67	– 11 137	– 51	11 094	113	1 931
Total 2020	**5 595**		**234**	**– 19 294**	**– 151**	**19 773**	**99**	**6 256**
2019								
US-specific healthcare plans and program rebates	1 883	0		– 5 183	– 193	5 474		1 981
Non-US-specific healthcare plans and program rebates	1 625	– 28	– 19	– 2 467	– 2	2 659	1	1 769
Non-healthcare plans and program-related rebates, returns and other deductions	1 754	– 166	9	– 11 698	– 25	11 868	103	1 845
Total 2019	**5 262**	**– 194**	**– 10**	**– 19 348**	**– 220**	**20 001**	**104**	**5 595**
2018								
US-specific healthcare plans and program rebates	1 590			– 4 158	– 90	4 541		1 883
Non-US-specific healthcare plans and program rebates	1 356		– 78	– 2 182	83	2 555	– 109	1 625
Non-healthcare plans and program-related rebates, returns and other deductions	1 726		– 51	– 12 227	– 91	11 956	441	1 754
Total 2018	**4 672**		**– 129**	**– 18 567**	**– 98**	**19 052**	**332**	**5 262**

[1] Notes 1, 2 and 30 provide information related to discontinued operations.
[2] Charges to the consolidated income statement from continuing operations were USD 18 248 million in 2018.

Restructuring provisions movements

(USD millions)	2020	2019	2018
January 1	**438**	**507**	**153**
Provisions related to discontinued operations[1]		– 8	
Additions[2]	354	492	534
Cash payments	– 268	– 479	– 145
Releases[3]	– 87	– 72	– 33
Currency translation effects	22	– 2	– 2
December 31	**459**	**438**	**507**

[1] Notes 1, 2 and 30 provide information related to discontinued operations.
[2] Additions to provisions charged to the consolidated income statement from continuing operations were USD 521 million in 2018.
[3] Reversal of provisions credited to the consolidated income statement from continuing operations were USD 31 million in 2018.

In 2020, additions to provisions of USD 354 million were mainly related to the following reorganizations:

- The Innovative Medicines Division restructured its field force and supporting functions in Region Europe.
- The Sandoz Division initiatives to realign its organizational structures to improve competiveness that commenced in 2019 continued.
- Group-wide initiatives to streamline Novartis Technical Operations through the setup of operations centers and implementation of new technologies, in the Innovative Medicines Division and the Sandoz Division, continued. In addition, Novartis Business Services continued the phased implementation of the new operating model to change outsourcing structures and transition activities to service centers.

In 2019, additions to provisions of USD 492 million were mainly related to the following reorganizations:

- The Innovative Medicines Division restructured its field force and supporting functions in Latin America, and following the *Xiidra* acquisition, its Ophthalmology field force in the US.
- The Sandoz Division initiatives to realign its organizational structures to improve competiveness. These ini-

tiatives include reduction in its headquarters, global functions and countries workforce, and the closure of its development center in Holzkirchen, Germany.
- Group-wide initiatives to streamline Novartis Technical Operations and implement new technologies, mainly in the Innovative Medicines Division and in the Sandoz Division, continued. In addition, Novartis Business Services launched the next phase of the new operating model to change outsourcing structures and transition activities to service centers.

In 2018, additions to provisions of USD 534 million were mainly related to the following reorganizations:

- The Innovative Medicines Division's Oncology business unit initiative to streamline its organizational structure. The objective was to enhance agility and efficiency, resulting in an acceleration of operational execution. In addition, a program to reorganize the Japanese business model was launched. Region Europe transformed its approach to market in light of the changing product portfolio. The objective was to speed up patient access.
- Group-wide initiatives to streamline Novartis Technical Operations and implement new technologies, mainly in the Innovative Medicines Division and in the Sandoz Division, continued. In addition, Novartis Business Services launched an initiative to reorganize its organizational structure to achieve cost efficiencies by shifting activities to global service centers.

23. Details to the consolidated statements of cash flows

23.1) Reversal of non-cash items and other adjustments from continuing operations

(USD millions)	**2020**	2019	2018
Depreciation, amortization and impairments on:			
Property, plant and equipment	1 758	1 547	1 783
Right-of-use assets [1]	330	305	
Intangible assets	4 376	3 974	3 428
Financial assets [2]	– 335	– 38	6
Change in provisions and other non-current liabilities	1 411	1 871	895
Gains on disposal and other adjustments on property, plant and equipment; intangible assets; financial assets; and other non-current assets, net	– 478	– 1 234	– 902
Equity-settled compensation expense	738	758	673
Income from associated companies [3]	– 673	– 659	– 6 438
Taxes	1 807	1 793	1 295
Net financial expense	947	805	746
Total	**9 881**	**9 122**	**1 486**

[1] Depreciation of right-of-use assets recognized from January 1, 2019, the date of implementation of IFRS 16 Leases. See Note 1.
[2] Includes fair value adjustments
[3] 2018 included a reversal of a pre-tax gain (USD 5.8 billion) recognized from the divestment of the investment in GSK Consumer Healthcare Holdings Ltd. (see Note 2). The net cash proceed of USD 13.0 billion from the divestment was included in the consolidated statements of cash flows in the line "Acquisitions and divestments of interests in associated companies, net."

23.2) Total amount of taxes paid

In 2020, the total amount of taxes paid was USD 1.9 billion, of which USD 1.8 billion was included within "Net cash flows from operating activities from continuing operations", and USD 88 million was included within "Net cash flows used in investing activities from discontinued operations."

In 2019, the total amount of taxes paid was USD 2.0 billion, of which USD 1.9 billion was included within "Net cash flows from operating activities from continuing operations", USD 38 million was included within "Net cash flows from operating activities from discontinued operations," and USD 79 million was included within "Net cash flows used in investing activities from discontinued operations."

In 2018, the total amount of taxes paid was USD 1.8 billion, of which USD 1.5 billion was included within "Net cash flows from operating activities from continuing operations", USD 164 million was included within "Net cash flows from operating activities from discontinued operations," and USD 139 million was included within "Net cash flows used in investing activities from continuing operations."

23.3) Cash flows from changes in working capital and other operating items included in the net cash flows from operating activities from continuing operations

(USD millions)	2020	2019	2018
(Increase) in inventories	– 543	– 382	– 387
Decrease/(increase) in trade receivables	137	– 980	– 544
(Decrease)/increase in trade payables	– 324	553	252
Change in other current assets	229	– 160	316
Change in other current liabilities	211	1 167	941
Other adjustments, net	– 1	1	– 2
Total	**– 291**	**199**	**576**

23.4) Cash flows arising from acquisitions and divestments of interests in associated companies, net

In 2018, acquisitions and divestments of interests in associated companies included USD 12 855 million net of taxes (USD 12 994 million before taxes) from the divestment of the investment in GSK Consumer Healthcare Holdings Ltd. (see Note 2).

23.5) Cash flows arising from acquisitions and divestments of businesses, net

The following table is a summary of the cash flow impact of acquisitions and divestments of businesses. The most significant transactions are described in Note 2.

(USD millions)	Note	2020	2019	2018
Net assets recognized as a result of acquisitions of businesses	24	**– 10 173**	**– 4 124**	**– 13 660**
Fair value of previously held equity interests		7	33	
Contingent consideration payables, net		98	242	– 5
Payments, deferred consideration and other adjustments, net		62	– 2	– 36
Cash flows used for acquisitions of businesses		**– 10 006**	**– 3 851**	**– 13 701**
Cash flows from divestments of businesses, net [1]		**49**	**91**	**18**
Cash flows used for acquisitions and divestments of businesses, net		**– 9 957**	**– 3 760**	**– 13 683**

[1] In 2020, USD 49 million represented the net cash inflows from divestments in previous years.
In 2019, the USD 91 million included USD 4 million of net cash outflows from divestments in previous years, and USD 95 million net cash inflows from business divestments in 2019. The net identifiable assets of the 2019 divested businesses amounted to USD 196 million, comprised of non-current assets of USD 159 million; current assets of USD 96 million, including USD 11 million cash and cash equivalents; non-current liabilities of USD 18 million; and current liabilities of USD 41 million.
In 2018, USD 18 million represented the net cash inflows from divestments in previous years.

Notes 2 and 24 provide further information regarding acquisitions and divestments of businesses. All acquisitions were for cash.

23.6) Reconciliation of liabilities arising from financing activities

(USD millions)	Non-current financial debts	Current financial debts and derivative financial instruments	Non-current lease liabilities	Current lease liabilities
January 1, 2020	**20 353**	**7 031**	**1 703**	**246**
Increase in non-current financial debts	7 126			
Repayments of non-current financial debts		– 2 003		
Change in current financial debts		2 261		
Payments of lease liabilities, net				– 312
Interest payments for amounts included in lease liabilities classified as cash flows from operating activities				– 56
New leases			221	73
Impact of acquisitions of businesses		32	36	8
Changes in fair values, and other changes, net	– 1		– 30	65
Amortization of bonds discount	16	5		
Currency translation effects	832	392	39	12
Reclassification from non-current to current, net	– 2 067	2 067	– 250	250
December 31, 2020	**26 259**	**9 785**	**1 719**	**286**

(USD millions)	Non-current financial debts	Current financial debts and derivative financial instruments	Non-current lease liabilities	Current lease liabilities
January 1, 2019	**22 470**	**9 678**		
Impact of adoption of IFRS 16 Leases continuing operations [1]	– 2	– 1	1 471	268
Impact of adoption of IFRS 16 Leases discontinued operations [2]	– 89		246	40
Financial debts and lease liabilities related to discontinued operations [3]		– 47	– 246	– 40
Increase in non-current financial debts	93			
Repayments of non-current financial debts		– 3 195		
Change in current financial debts		– 1 582		
Payments of lease liabilities, net				– 273
Interest payments for amounts included in lease liabilities classified as cash flows from operating activities				– 51
New leases			362	131
Impact of acquisitions and divestments of businesses		2	– 11	– 6
Changes in fair values, and other changes, net		129	33	20
Amortization of bonds discount	25			
Currency translation effects	– 141	44	4	1
Reclassification from non-current to current, net	– 2 003	2 003	– 156	156
December 31, 2019	**20 353**	**7 031**	**1 703**	**246**

[1] Lease liabilities recognized on January 1, 2019, the date of implementation of IFRS 16 Leases. See Note 1.
[2] In 2018, financial debts included USD 89 million for previously reported finance lease obligations of the Alcon business that were reclassified on January 1, 2019, to lease liabilities, with the adoption of IFRS 16 Leases. Note 30 provides additional disclosures.
[3] Represents the financial debts and lease liabilities at January 1, 2019, related to the Alcon business reported as discontinued operations. See Notes 1, 2 and 30.

(USD millions)	Non-current financial debts	Current financial debts and derivative financial instruments
January 1, 2018	**23 224**	**5 308**
Increase in non-current financial debts [1]	2 856	
Repayments of non-current financial debts [2]		– 366
Change in current financial debts [3]		1 681
Impact of acquisitions of businesses	10	4
Changes in fair values, and other changes	5	– 48
Amortization of bonds discount	27	2
Currency translation effects	– 462	– 93
Current portion of non-current financial debt	– 3 190	3 190
December 31, 2018	**22 470**	**9 678**

[1] Increase in non-current financial debts was only recorded in the consolidated statements of cash flows from continuing operations.
[2] Repayment of non-current financial debts was only recorded in the consolidated statements of cash flows from continuing operations.
[3] Changes in current financial debts included in the consolidated statements of cash flows from continuing operations were USD 1 687 million.

For net cash flows used in investing activities from discontinued operations, see Note 30.

24. Acquisitions of businesses

Fair value of assets and liabilities arising from acquisitions of businesses

(USD millions)	**2020**	2019	2018
Property, plant and equipment	26	44	137
Right-of-use assets	32		
Currently marketed products	196	3 550	2 531
Acquired research and development	8 600	342	10 224
Other intangible assets	218	22	1
Deferred tax assets	476	60	381
Non-current financial and other assets	49	8	19
Inventories	84	195	20
Trade receivables and financial and other current assets	109	4	90
Cash and cash equivalents	76		1 112
Deferred tax liabilities	– 1 977	– 107	– 2 874
Current and non-current financial debts	– 32	– 2	– 14
Current and non-current lease liabilities	– 44		
Trade payables and other liabilities	– 144	– 178	– 627
Net identifiable assets acquired	**7 669**	**3 938**	**11 000**
Acquired cash and cash equivalents	– 76		– 1 112
Non-controlling interests			– 26
Goodwill	2 580	186	4 084
Net assets recognized as a result of acquisitions of businesses [1]	**10 173**	**4 124**	**13 946**

[1] In 2018, net assets recognized as a result of acquisitions of businesses in the consolidated balance sheet from continuing operations were USD 13 660 million.

Note 2 details significant acquisitions of businesses, specifically, The Medicines Company and the Japanese business of AGI in 2020; *Xiidra* and IFM Tre, Inc. in 2019; and AAA, AveXis and Endocyte in 2018. The goodwill arising out of these acquisitions is attributable to the buyer specific synergies, the assembled workforce, and the accounting for deferred tax liabilities on the acquired assets. Goodwill of USD 74 million in 2020 (2019: USD 98 million, 2018: nil) is tax deductible.

25. Post-employment benefits for associates

Defined benefit plans

In addition to the legally required social security schemes, the Group has numerous independent pension and other post-employment benefit plans. In most cases, these plans are externally funded in entities that are legally separate from the Group. For certain Group companies, however, no independent plan assets exist for the pension and other post-employment benefit obligations of associates. In these cases, the related unfunded liability is included in the balance sheet. The defined benefit obligations (DBOs) of all major pension and other post-employment benefit plans are reappraised annually by independent actuaries. Plan assets are recognized at fair value. The major plans are based in Switzerland, the United States, the United Kingdom, Germany and Japan, which represent 95% of the Group's total DBO for pension plans. Details of the plans in the two most significant countries, Switzerland and the United States, which represent 81% of the Group's total DBO for post-employment benefit plans, are provided below.

Swiss-based pension plans represent the most significant portion of the Group's total DBO and plan assets. For the active insured members born on or after January 1, 1956, or having joined the plans after December 31, 2010, the benefits are partially linked to the contributions paid into the plan. Certain features of Swiss pension plans required by law preclude the plans from being categorized as defined contribution plans. These factors include a minimum interest guarantee on retirement savings accounts, a predetermined factor for converting the accumulated savings account balance into a pension, and embedded death and disability benefits.

All benefits granted under Swiss-based pension plans are vested, and Swiss legislation prescribes that the employer has to contribute a fixed percentage of an associate's pay to an external pension fund. Additional employer contributions may be required whenever the plan's statutory funding ratio falls below a certain level. The associate also contributes to the plan. The pension plans are run by separate legal entities, each governed by a board of trustees that – for the principal plans – consists of representatives nominated by Novartis and the active insured associates. The boards of trustees are responsible for the plan design and asset investment strategy.

In December 2020 the Board of Trustees of the Novartis Swiss Pension Fund agreed to adjust the annuity conversion rate at retirement with effect from January 1, 2022. This amendment does not affect existing pensioners, and its impact on existing plan participants will be mitigated by way of defined compensatory measures. This amendment resulted in a net pre-tax curtailment gain of USD 101 million (CHF 90 million).

The United States pension plans represent the second-largest component of the Group's total DBO and plan assets. The principal plans (Qualified Plans) are funded, whereas plans providing additional benefits for executives (Restoration Plans) are unfunded. Employer contributions are required for Qualified Plans whenever the statutory funding ratio falls below a certain level.

Furthermore, in certain countries, associates are covered under other post-employment benefit plans and post-retirement medical plans.

In the US, other post-employment benefit plans consist primarily of post-employment healthcare benefits, which have been closed to new members since 2015. Part of the costs of these plans is reimbursable under the Medicare Prescription Drug, Improvement, and Modernization Act of 2003. There is no statutory funding requirement for these plans. The Group is funding these plans to the extent that it is tax efficient.

The following tables are a summary of the funded and unfunded defined benefit obligation for pension and other post-employment benefit plans of associates at December 31, 2020 and 2019:

	Pension plans		Other post-employment benefit plans	
(USD millions)	**2020**	2019	**2020**	2019
Benefit obligation at January 1	**23 066**	**22 179**	**746**	**1 073**
Benefit obligations related to discontinued operations [1]		– 662		– 385
Current service cost	372	336	11	13
Interest cost	222	330	20	29
Past service costs and settlements	– 102	– 168	1	
Administrative expenses	24	24		
Remeasurement losses/(gains) arising from changes in financial assumptions	1 166	1 791	40	76
Remeasurement (gains)/losses arising from changes in demographic assumptions	– 28	– 193	– 13	– 9
Experience-related remeasurement losses/(gains)	159	184	– 132	– 22
Currency translation effects	1 810	283	– 7	
Benefit payments	– 1 264	– 1 256	– 33	– 30
Contributions of associates	186	169		
Effect of acquisitions, divestments or transfers	– 9	49	– 1	1
Benefit obligation at December 31	**25 602**	**23 066**	**632**	**746**
Fair value of plan assets at January 1	**19 810**	**18 838**	**134**	**119**
Plan assets related to discontinued operations [1]		– 424		– 40
Interest income	166	257	4	3
Return on plan assets excluding interest income	1 318	1 656	4	10
Currency translation effects	1 620	304		
Novartis Group contributions	464	420	– 20	74
Contributions of associates	186	169		
Settlements	15	– 193		
Benefit payments	– 1 264	– 1 256	– 33	– 30
Effect of acquisitions, divestments or transfers	2	39		– 2
Fair value of plan assets at December 31	**22 317**	**19 810**	**89**	**134**
Funded status	**– 3 285**	**– 3 256**	**– 543**	**– 612**
Limitation on recognition of fund surplus at January 1	**– 65**	**– 68**		
Change in limitation on recognition of fund surplus (incl. exchange rate differences)	16	7		
Interest income on limitation of fund surplus	– 2	– 4		
Limitation on recognition of fund surplus at December 31	**– 51**	**– 65**		
Net liability in the balance sheet at December 31	**– 3 336**	**– 3 321**	**– 543**	**– 612**

[1] Notes 1, 2 and 30 provide information related to discontinued operations.

The reconciliation of the net liability from January 1 to December 31 is as follows:

	Pension plans		Other post-employment benefit plans	
(USD millions)	**2020**	2019	**2020**	2019
Net liability at January 1	**– 3 321**	**– 3 409**	**– 612**	**– 954**
Less: net liability related to discontinued operations [1]		238		345
Current service cost	– 372	– 336	– 11	– 13
Net interest expense	– 58	– 77	– 16	– 26
Administrative expenses	– 24	– 24		
Past service costs and settlements	117	– 25	– 1	
Remeasurements	21	– 126	109	– 35
Currency translation effects	– 190	21	7	
Novartis Group contributions	464	420	– 20	74
Effect of acquisitions, divestments or transfers	11	– 10	1	– 3
Change in limitation on recognition of fund surplus	16	7		
Net liability at December 31	**– 3 336**	**– 3 321**	**– 543**	**– 612**
Amounts recognized in the consolidated balance sheet				
Prepaid benefit cost	202	148		
Accrued benefit liability	– 3 538	– 3 469	– 543	– 612

[1] Notes 1, 2 and 30 provide information related to discontinued operations.

The following table shows a breakdown of the DBO for pension plans by geography and type of member, and the breakdown of plan assets into the geographical locations in which they are held:

	2020				2019			
(USD millions)	Switzerland	United States	Rest of the world	Total	Switzerland	United States	Rest of the world	Total
Benefit obligation at December 31	**16 807**	**3 788**	**5 007**	**25 602**	**15 106**	**3 552**	**4 408**	**23 066**
Thereof unfunded		*701*	*516*	*1 217*		*670*	*466*	*1 136*
By type of member								
Active	6 837	665	1 573	9 075	6 167	630	1 400	8 197
Deferred pensioners		1 290	1 819	3 109		1 205	1 517	2 722
Pensioners	9 970	1 833	1 615	13 418	8 939	1 717	1 491	12 147
Fair value of plan assets at December 31	**16 396**	**2 487**	**3 434**	**22 317**	**14 457**	**2 311**	**3 042**	**19 810**
Funded status	**– 411**	**– 1 301**	**– 1 573**	**– 3 285**	**– 649**	**– 1 241**	**– 1 366**	**– 3 256**

The following table shows a breakdown of the DBO for other post-employment benefit plans by geography and type of member, and the breakdown of plan assets into the geographical locations in which they are held:

	2020			2019		
(USD millions)	United States	Rest of the world	Total	United States	Rest of the world	Total
Benefit obligation at December 31	**543**	**89**	**632**	**658**	**88**	**746**
Thereof unfunded	*454*	*89*	*543*	*524*	*88*	*612*
By type of member						
Active	80	25	105	121	36	157
Deferred pensioners	17	0	17	15	0	15
Pensioners	446	64	510	522	52	574
Fair value of plan assets at December 31	**89**	**0**	**89**	**134**	**0**	**134**
Funded status	**– 454**	**– 89**	**– 543**	**– 524**	**– 88**	**– 612**

The following table shows the principal weighted average actuarial assumptions used for calculating defined benefit plans and other post-employment benefits of associates:

	Pension plans			Other post-employment benefit plans		
	2020	2019	2018	**2020**	2019	2018
Weighted average assumptions used to determine benefit obligations at December 31						
Discount rate	0.6%	1.0%	1.6%	2.9%	3.6%	4.4%
Expected rate of pension increase	0.3%	0.3%	0.4%			
Expected rate of salary increase	2.7%	2.8%	2.8%			
Interest on savings account	0.1%	0.3%	0.8%			
Current average life expectancy for a 65-year-old male in years	22	22	22	21	21	21
Current average life expectancy for a 65-year-old female in years	24	24	24	23	23	23

Changes in the aforementioned actuarial assumptions can result in significant volatility in the accounting for the Group's pension plans in the consolidated financial statements. This can result in substantial changes in the Group's other comprehensive income, long-term liabilities and prepaid pension assets.

The DBO is significantly impacted by assumptions regarding the rate that is used to discount the actuarially determined post-employment benefit liability. This rate is based on yields of high-quality corporate bonds in the country of the plan. Decreasing corporate bond yields decrease the discount rate, so that the DBO increases and the funded status decreases.

In Switzerland, an increase in the DBO due to lower discount rates is slightly offset by lower future benefits expected to be paid on the associate's savings account where the assumption on interest accrued changes in line with the discount rate.

The impact of decreasing interest rates on a plan's assets is more difficult to predict. A significant part of the plan assets is invested in bonds. Bond values usually rise when interest rates decrease and may therefore partially compensate for the decrease in the funded status. Furthermore, pension assets also include significant holdings of equity instruments. Share prices tend to rise when interest rates decrease and therefore often counteract the negative impact of the rising defined benefit obligation on the funded status (although the correlation of interest rates with equities is not as strong as with bonds, especially in the short term).

The expected rate for pension increases significantly affects the DBO of most plans in Switzerland, Germany and the United Kingdom. Such pension increases also decrease the funded status, although there is no strong correlation between the value of the plan assets and pension/inflation increases.

Assumptions regarding life expectancy significantly impact the DBO. An increase in longevity increases the DBO. There is no offsetting impact from the plan assets, as no longevity bonds or swaps are held by the pension funds. Generational mortality tables are used where this data is available.

The following table shows the sensitivity of the defined benefit pension obligation to the principal actuarial assumptions for the major plans in Switzerland, the United States, the United Kingdom, Germany and Japan on an aggregated basis:

(USD millions)	Change in 2020 year-end defined benefit pension obligation
25 basis point increase in discount rate	– 885
25 basis point decrease in discount rate	942
One-year increase in life expectancy	993
25 basis point increase in rate of pension increase	589
25 basis point decrease in rate of pension increase	– 143
25 basis point increase of interest on savings account	62
25 basis point decrease of interest on savings account	– 30
25 basis point increase in rate of salary increase	61
25 basis point decrease in rate of salary increase	– 61

The healthcare cost trend rate assumptions used for other post-employment benefits are as follows:

	2020	2019	2018
Healthcare cost trend rate assumed for next year	6.3%	6.5%	7.0%
Rate to which the cost trend rate is assumed to decline	4.5%	4.5%	4.5%
Year that the rate reaches the ultimate trend rate	2028	2028	2028

The following table shows the weighted average plan asset allocation of funded defined benefit pension plans at December 31, 2020 and 2019:

	Pension plans			
(as a percentage)	Long-term target minimum	Long-term target maximum	**2020**	2019
Equity securities	15	40	28	27
Debt securities	20	60	34	36
Real estate	5	20	17	17
Alternative investments	0	20	13	15
Cash and other investments	0	15	8	5
Total			**100**	100

Cash and most of the equity and debt securities have a quoted market price in an active market. Real estate and

alternative investments, which include hedge fund, private equity, infrastructure and commodity investments, usually have a quoted market price or a regularly updated net asset value.

The strategic allocation of assets of the different pension plans is determined with the objective of achieving an investment return that, together with the contributions paid by the Group and its associates, is sufficient to maintain reasonable control over the various funding risks of the plans. Based upon the market and economic environments, actual asset allocations may temporarily be permitted to deviate from policy targets. The asset allocation currently includes investments in shares of Novartis AG as per the below table:

	December 31, 2020	December 31, 2019
Investment in shares of Novartis AG		
Number of shares (in millions)	2.3	2.3
Market value (in USD billions)	0.2	0.2

The weighted average duration of the defined benefit obligation is 15.4 years (2019: 15.2 years).

The Group's ordinary contribution to the various pension plans is based on the rules of each plan. Additional contributions are made whenever this is required by statute or law (i.e., usually when statutory funding levels fall below predetermined thresholds). The only significant plans that are foreseen to require additional funding are those in the United Kingdom and Germany.

The expected future cash flows in respect of pension and other post-employment benefit plans at December 31, 2020, were as follows:

(USD millions)	Pension plans	Other post-employment benefit plans
Novartis Group contributions		
2021 (estimated)	404	40
Expected future benefit payments		
2021	1 245	40
2022	1 198	41
2023	1 191	41
2024	1 182	40
2025	1 165	40
2026–2030	5 651	181

Defined contribution plans

In many subsidiaries, associates are covered by defined contribution plans. Contributions charged to the consolidated income statement for the defined contribution plans were:

(USD millions)	**2020**	2019	2018
Contributions for defined contribution plans continuing operations	501	422	443

For defined contribution plans for discontinued operations, see Note 30.

26. Equity-based participation plans for associates

The expense related to all equity-based participation plans and the liabilities arising from equity-based payment transactions were as follows:

(USD millions)	**2020**	2019	2018
Expense related to equity-based participation plans	958	1 067	918
Liabilities arising from equity-based payment transactions	269	326	273

Equity-based participation plans can be separated into the following plans:

Annual Incentive

The Annual Incentive for the Novartis Group CEO and other Executive Committee members (ECN) is paid 50% in cash and 50% in Novartis restricted shares (RSs) or restricted share units (RSUs). For the Novartis Top Leaders (NTLs), the Annual Incentive is paid 70% in cash and 30% in RSs or RSUs. Both the ECN and NTLs can opt to invest up to the maximum cash portion of their Annual Incentive to receive further RSs or RSUs. Any cash is paid out during February or March in the year following the end of the performance period, and the shares are granted during January in the year following the end of the performance period.

Share savings plans

Associates in certain countries and certain key executives worldwide are encouraged to invest their Annual Incentive in a share savings plan.

Under the share savings plan, participants may elect to receive their relevant compensation fully or partially in Novartis shares in lieu of cash. As a reward for their participation in the share savings plan, at no additional cost to the participant, Novartis matches their investments in shares after a holding period of three or five years.

Novartis operates share savings plans for which associates may only participate in one of the share savings

plans in any given year. The most significant are listed below:

- In Switzerland, Employee Share Ownership Plan (ESOP) participants may choose to receive their Annual Incentive (i) 100% in shares, (ii) 50% in shares and 50% in cash, or (iii) 100% in cash. After expiration of a three-year holding period for Novartis shares invested under the ESOP, participants will receive one matching share for every two invested shares. Associates eligible for the equity plan "Select" are not eligible to receive ESOP matching shares starting with the 2017 performance period.
- The Leveraged Share Savings Plan (LSSP) was available to key executives for performance periods prior to 2016. At the participant's election, the Annual Incentive was awarded partly or entirely in shares. The elected number of shares is subject to a holding period of five years. At the end of the holding period, Novartis will match the invested shares at a ratio of 1-to-1 (i.e., one share awarded for each invested share). In the United States, both the LSSP award and the corresponding match are cash settled.

The Novartis Group CEO, the other Executive Committee members from 2014, and the NTLs from 2016 are not eligible to participate in the share savings plans.

Novartis equity plan "Select"

The equity plan "Select" is a global equity incentive plan under which eligible associates may annually be awarded a grant subject to a three-year, and for selected units a four-year, staggered vesting period. No awards are granted for performance ratings below a certain threshold. Executive Committee members and NTLs are not eligible to participate in the equity plan "Select".

The equity plan "Select" currently allows participants in Switzerland to choose the form of their equity compensation in RSs or RSUs. In all other jurisdictions, RSs or RSUs are granted unilaterally. Until 2013, participants could also choose to receive part or the entire grant in the form of tradable share options.

Tradable share options expire on their 10th anniversary from the grant date. Each tradable share option entitles the holder to purchase after vesting (and before the 10th anniversary from the grant date) one Novartis share at a stated exercise price that equals the closing market price of the underlying share at the grant date. As the exercise price does not reflect the decrease in the Novartis share due to the Alcon spin, one-fifth of an Alcon share will also be awarded to the option holder upon exercise.

Options under Novartis equity plan "Select" outside North America

The following table shows the activity associated with the share options during the period. The weighted average prices in the table below are translated from Swiss francs into USD at historical rates.

	2020		2019	
	Options (millions)	Weighted average exercise price (USD)	Options (millions)	Weighted average exercise price (USD)
Options outstanding at January 1	**3.4**	**60.9**	5.6	59.9
Sold or exercised	– 0.8	57.3	– 2.2	58.4
Outstanding at December 31	**2.6**	**62.0**	3.4	60.9
Exercisable at December 31	**2.6**	**62.0**	3.4	60.9

All share options were granted at an exercise price that was equal to the closing market price of the Group's shares at the grant date. The weighted average share price at the dates of sale or exercise was USD 91.7.

The following table summarizes information about share options outstanding at December 31, 2020:

Options outstanding				Total/ weighted average
Number outstanding (millions)	0.4	0.8	1.4	**2.6**
Remaining contractual life (years)	0.0	1.0	2.0	**1.4**
Exercise price (USD)	57.0	57.6	66.0	**62.0**

Options under Novartis equity plan "Select" for North America

The following table shows the activity associated with the ADR options during the period:

	2020		2019	
	ADR options (millions)	Weighted average exercise price (USD)	ADR options (millions)	Weighted average exercise price (USD)
Options outstanding at January 1	**9.6**	**61.9**	15.2	60.7
Sold or exercised	– 2.9	59.6	– 5.6	58.6
Outstanding at December 31	**6.7**	**62.9**	9.6	61.9
Exercisable at December 31	**6.7**	**62.9**	9.6	61.9

All ADR options were granted at an exercise price that was equal to the closing market price of the ADRs at the grant date. The weighted average ADR price at the dates of sale or exercise was USD 92.2.

The following table summarizes information about ADR options outstanding at December 31, 2020:

ADR options outstanding				Total/ weighted average
Number outstanding (millions)	0.4	2.3	4.0	**6.7**
Remaining contractual life (years)	0.0	1.0	2.0	**1.5**
Exercise price (USD)	57.0	58.3	66.1	**62.9**

Long-Term Performance Plan

The Long-Term Performance Plan (LTPP) is an equity plan for the ECN, the NTLs and employees of Group units with specific targets.

Participants are granted a target number of performance share units (PSUs) at the beginning of every performance period, which are converted into unrestricted Novartis shares after the performance period. The actual payout depends on the achievement of the performance measures and ranges between 0% and 200% of the granted amount. PSUs granted under the LTPP do not carry voting rights, but do carry dividend equivalents that are paid in unrestricted Novartis shares at the end of the performance period.

The LTPP awards are subject to a three-year performance and vesting period. Until 2018, the performance criteria were based on Novartis internal performance metrics. Starting in 2019, for new grants the performance criteria are based on both Novartis internal performance metrics and variables that can be observed in the market, which is the ranking of the Novartis total shareholder return (TSR) relative to a global healthcare peer group of 14 other companies, over rolling three-year performance periods.

TSR for Novartis and the peer companies is calculated as the change in the company share price, which is translated to USD at the relevant exchange rate, including the reinvestment return of dividends, over the three-year performance period. The calculation is based on Bloomberg standard published TSR data, which is publicly available. The position of Novartis in the peer group determines the payout range based on a payout matrix.

Long-Term Relative Performance Plan

The LTRPP is an equity plan for the Novartis ECN and NTLs. The last grant under this plan was made in 2018. The LTRPP performance criteria are based on variables that can be observed in the market, which is the ranking of the Novartis TSR relative to a global healthcare peer group of 14 other companies, over rolling three-year performance periods. The TSR for Novartis and the peer companies is calculated as described in the LTPP section above.

Other share awards

Selected associates, excluding the ECN members, may exceptionally receive Special Share Awards of RSs or RSUs. These Special Share Awards provide an opportunity to reward outstanding achievements or exceptional performance, and aim to retain key contributors. They are based on a formal internal selection process, through which the individual performance of each candidate is thoroughly assessed at several management levels. Special Share Awards have a minimum three-year vesting period. In exceptional circumstances, Special Share Awards may be awarded to attract special expertise and new talents to the organization.

Worldwide, associates at different levels in the organization were awarded RSs and RSUs in 2020, 2019 and 2018.

In addition, in 2020, 2019 and 2018, Board members received unrestricted shares as part of their regular compensation.

Summary of non-vested share movements

The table below provides a summary of non-vested share movements (RSs, RSUs and PSUs) for all plans:

	2020			2019		
	Number of shares in millions	Weighted average fair value at grant date in USD	Fair value at grant date in USD millions	Number of shares in millions	Weighted average fair value at grant date in USD	Fair value at grant date in USD millions
Non-vested shares at January 1	**25.8**	**71.1**	**1 835**	**25.7**	**77.1**	**1 981**
Granted						
– Annual Incentive	1.1	93.7	103	1.1	78.4	86
– Share savings plans	4.2	95.0	399	4.2	83.0	349
– Select North America	3.3	86.7	286	5.3	64.0	339
– Select outside North America	2.0	89.4	179	2.6	67.4	175
– Long-Term Performance Plan	2.5	85.1	213	2.5	68.9	172
– Long-Term Relative Performance Plan [1]	0.2	0.0	0	0.1	0.0	0
– Other share awards	1.5	78.0	117	1.9	67.7	129
Vested	– 13.8	74.2	– 1 024	– 13.3	80.3	– 1 068
Forfeited	– 2.0	75.3	– 151	– 4.3	76.3	– 328
Non-vested shares at December 31	**24.8**	**78.9**	**1 957**	**25.8**	**71.1**	**1 835**

[1] LTRPP grants in 2020 represent incremental payouts based on performance criteria under the plan. In 2019 the LTRPP grants are keep whole awards granted due to the spin-off of the Alcon business.

At April 8, 2019, the Alcon spin-off date, all RSU and PSU holders, who were not entitled to the dividend in kind in the form of Alcon shares received keep whole awards in Novartis shares to compensate for the loss of the Alcon value from their Novartis shares. These keep whole awards were accounted for as a modification. As they did not increase the value of the original grant, they did not lead to additional expense. In the table above, this is reflected by a zero fair value at grant date amount.

27. Transactions with related parties

Roche Holding AG

Novartis has two agreements with Genentech, Inc., United States (Genentech), and one agreement with Spark Therapeutics, Inc., United States (Spark). Both companies are subsidiaries of Roche Holding AG (Roche), which is indirectly included in the consolidated financial statements using equity accounting since Novartis holds 33.3% of the outstanding voting shares of Roche (see Note 4).

Lucentis
Novartis has licensed from Genentech/Roche the exclusive rights to develop and market *Lucentis* outside the United States for indications related to diseases of the eye. Novartis pays royalties on the net sales of *Lucentis* products outside the United States. In 2020, *Lucentis* sales of USD 1.9 billion (2019: USD 2.1 billion; 2018: USD 2.0 billion) were recognized by Novartis.

Xolair
Novartis and Genentech/Roche are co-promoting *Xolair* in the United States, where Genentech/Roche records all sales. Novartis records sales outside the United States.

Novartis markets *Xolair* and records all sales and related costs outside the United States as well as co-promotion costs in the US. Genentech/Roche and Novartis share the resulting profits from sales in the United States, Europe and other countries, according to agreed profit-sharing percentages. In 2020, Novartis recognized total sales of *Xolair* of USD 1.3 billion (2019: USD 1.2 billion; 2018: USD 1.0 billion), including sales to Genentech/Roche for the United States market.

Luxturna
In 2018, Novartis entered into an exclusive licensing and commercialization agreement and a supply agreement with Spark for *Luxturna* outside the United States. The agreements include regulatory and sales milestones as well as royalties payable to Spark on ex-US sales. On December 17, 2019, Roche acquired Spark.

The net income for royalties, cost sharing and profit sharing arising out of the *Lucentis*, *Xolair* and *Luxturna* agreements with Roche totaled USD 217 million in 2020 (net income in 2019: USD 101 million; net expense in 2018: USD 34 million).

Furthermore, Novartis has several patent license, supply and distribution agreements with Roche.

Novartis Pension Fund

In 2018, a Group subsidiary provided an uncommitted overnight credit facility to the Novartis Pension Fund, Switzerland, for up to USD 500 million with interest at the US Federal Funds Rate. This credit facility was not utilized during the years 2020, 2019 and 2018.

Executive Officers and Non-Executive Directors compensation

During 2020, there were 13 Executive Committee members ("Executive Officers"). There were 15 Executive Officers in 2019 and 17 Executive Officers in 2018, including those who stepped down.

The total compensation for Executive Committee members and the 14 Non-Executive Directors (13 in 2019 and 2018) using the Group's accounting policies for equity-based compensation and pension benefits was as follows:

	Executive Officers			Non-Executive Directors			Total		
(USD millions)	**2020**	2019	2018	**2020**	2019	2018	**2020**	2019	2018
Cash and other compensation	25.6	20.7	22.5	4.6	4.1	4.0	30.2	24.8	26.5
Post-employment benefits	2.7	2.6	2.5				2.7	2.6	2.5
Equity-based compensation	41.1	40.6	42.5	5.2	4.6	4.8	46.3	45.2	47.3
Total	**69.4**	**63.9**	**67.5**	**9.8**	**8.7**	**8.8**	**79.2**	**72.6**	**76.3**

During 2020, the IFRS compensation expense increased due to higher cash and other compensation. This increase in cash compensation is mainly attributable to ECN members who joined the ECN during 2019, as a result 2019 represented only a portion of their annual compensation. Other compensation increased on account of higher social security payments on vested equity-based compensation.

During 2019, the IFRS compensation expense decreased due to lower cash buyout payments to new executive officers and the forfeiture of equity-based compensation as a result of the resignation of an executive officer. These effects were partially offset by higher equity based compensation of executive officers appointed over the last three years.

The Annual Incentive award, which is fully included in equity-based compensation even when paid out in cash, is granted in January in the year following the reporting period.

The disclosures on Board and executive compensation required by the Swiss Code of Obligations and in accordance with the Swiss Ordinance against Excessive Compensation in Stock Exchange Listed Companies are shown in the Compensation Report of the Group.

Transactions with former members of the Board of Directors

During 2020, 2019 and 2018, the following payments (or waivers of claims) were made to former Board members or to "persons closely" linked to them:

	Currency	**2020**	2019	2018
Dr. Krauer	CHF	60 000	60 000	60 000
Dr. Vasella	CHF			18 228

Dr. Alex Krauer, Honorary Chairman, is entitled to an amount of CHF 60 000 for annual periods from one AGM to the next. This amount was fixed in 1998 upon his departure from the Board in 1999, and has not been revised since that date.

28. Commitments and contingencies

Research and development commitments

The Group has entered into long-term research and development agreements with various institutions, which provide for potential milestone payments by Novartis that may be capitalized. As of December 31, 2020, the Group's commitments to make payments under those agreements, and their estimated timing, were as follows:

(USD millions)	**2020**
2021	449
2022	691
2023	325
2024	483
2025	281
Thereafter	3 003
Total	**5 232**

In addition in November 2020 and in January 2021, Novartis entered into long-term research and development agreements, both of which did not close as of January 25, 2021. These agreements provide for potential milestones payments by Novartis that may be capitalized. Based on their estimated timing, the payments for these transactions are expected to amount to USD 549 million in 2021, USD 248 million in 2022, USD 160 million in 2023, USD 415 million in 2024, USD 515 million in 2025, USD 1 409 million later than 2025, for a total of USD 3 296 million.

Commitments for capital calls

The Group holds investments in funds in which it has committed to invest further upon future capital calls. As of December 31, 2020, the total uncalled capital commitments for the Group's investments in funds amounts to USD 87 million. Note 29 contains further information on the Group's investments in funds.

Other commitments

The Group has entered into various purchase commitments for services and materials as well as for equipment in the ordinary course of business. These commitments are generally entered into at current market prices and reflect normal business operations. For disclosure of property, plant and equipment purchase commitments, see Note 9.

Guarantees issued

The Group has issued guarantees to third parties in the ordinary course of business, mostly for tax, customs or other governmental agencies.

In addition, Novartis AG is guarantor of the Group's issued bonds, credit facilities and commercial paper programs.

Contingencies

Group companies have to observe the laws, government orders and regulations of the country in which they operate.

A number of Novartis companies are, and will likely continue to be, subject to various legal proceedings and investigations that arise from time to time, including proceedings regarding product liability; sales and marketing practices; commercial disputes; employment and wrongful discharge; and antitrust, securities, health and safety, environmental, tax, international trade, privacy and intellectual property matters. As a result, the Group may become subject to substantial liabilities that may not be covered by insurance and that could affect our business, financial position and reputation. While Novartis does not believe that any of these legal proceedings will have a material adverse effect on its financial position, litigation is inherently unpredictable and large judgments sometimes occur. As a consequence, Novartis may in the future incur judgments or enter into settlements of claims that could have a material adverse effect on its results of operations or cash flow.

Governments and regulatory authorities around the world have been stepping up their compliance and law enforcement activities in recent years in key areas, including marketing practices, pricing, corruption, trade restrictions, embargo legislation, insider trading, antitrust, cyber security and data privacy. Further, when one government or regulatory authority undertakes an investigation, it is not uncommon for other governments or regulators to undertake investigations regarding the same or similar matters. Responding to such investigations is costly and requires an increasing amount of management's time and attention. In addition, such investigations may affect our reputation, create a risk of potential exclusion from government reimbursement programs in the United States and other countries, and lead to (or arise from) litigation. These factors have contributed to decisions by Novartis and other companies in the healthcare industry, when deemed in their interest, to enter into settlement agreements with governmental authorities around the world prior to any formal decision by the authorities or a court. These government settlements have involved and may in the future involve large cash payments, sometimes in the hundreds of millions of dollars or more, including the potential repayment of amounts allegedly obtained improperly and other penalties, including treble damages. In addition, settlements of government healthcare fraud cases often require companies to enter into corporate integrity agreements, which are intended to regulate company behavior for a period of years. Our affiliate Novartis Corporation is a party to such an agreement, which will expire in 2025. Also, matters underlying governmental investigations and settlements may be the subject of separate private litigation.

While provisions have been made for probable losses, which management deems to be reasonable or appropriate, there are uncertainties connected with these estimates.

Note 20 contains additional information on these matters.

A number of Group companies are involved in legal proceedings concerning intellectual property rights. The inherent unpredictability of such proceedings means that there can be no assurances as to their ultimate outcome. A negative result in any such proceeding could potentially adversely affect the ability of certain Novartis companies to sell their products, or require the payment of substantial damages or royalties.

In the opinion of management, however, the outcome of these actions will not materially affect the Group's financial position but could be material to the results of operations or cash flow in a given period.

The Group's potential environmental remediation liability is assessed based on a risk assessment and investigation of the various sites identified by the Group as at risk for environmental remediation exposure. The Group's future remediation expenses are affected by a number of uncertainties. These uncertainties include, but are not limited to, the method and extent of remediation, the percentage of material attributable to the Group at the remediation sites relative to that attributable to other parties, and the financial capabilities of the other potentially responsible parties.

Note 20 contains additional information on environmental liabilities.

29. Financial instruments – additional disclosures

The following tables show the carrying values of financial instruments by measurement categories as of December 31, 2020 and 2019. Except for straight bonds (see Note 19), the carrying values are equal to, or a reasonable approximation of, the fair values.

		2020			
(USD millions)	Note	Financial instruments at amortized costs	Financial instruments at fair value through other comprehensive income	Financial instruments at fair value through the consolidated income statement	Other financial liabilities
Cash and cash equivalents	16	9 658			
Time deposits and short-term investments with original maturity more than 90 days	16	1 609			
Trade receivables	15	8 217			
Other current assets	17	963			
Marketable securities – debt securities	16		26		
Long-term financial investments – equity securities	13		1 111	466	
Long-term financial investments – debt securities	13		36		
Long-term financial investments – fund investments	13			366	
Long-term loans, advances, security deposits and other long-term receivables	13	297			
Associated companies at fair value through profit and loss				211	
Derivative financial instruments	16			159	
Contingent consideration receivables	13			625	
Total financial assets		**20 744**	**1 173**	**1 827**	
Interest-bearing accounts of associates payable on demand	21	2 085			
Bank and other short-term financial debt	21	976			
Commercial paper	21	4 258			
Straight bonds	19	28 298			
Long-term liabilities to banks and other financial institutions	19	233			
Trade payables		5 403			
Commitment for repurchase of own shares	18/22	1 769			
Contingent consideration liabilities (see Note 20/22) and other financial liabilities				1 069	
Derivative financial instruments	21			194	
Lease liabilities	10				2 005
Total financial liabilities		**43 022**		**1 263**	**2 005**

(USD millions)	Note	2019 Financial instruments at amortized costs	Financial instruments at fair value through other comprehensive income	Financial instruments at fair value through the consolidated income statement	Other financial liabilities
Cash and cash equivalents	16	11 112			
Time deposits and short-term investments with original maturity more than 90 days	16	61			
Trade receivables	15	8 301			
Other current assets	17	2 036			
Marketable securities – debt securities	16		24		
Marketable securities – fund investments	16			37	
Long-term financial investments – equity securities	13		1 158	366	
Long-term financial investments – debt securities	13		33		
Long-term financial investments – fund investments	13			233	
Long-term loans, advances, security deposits and other long-term receivables	13	329			
Associated companies at fair value through profit and loss				186	
Derivative financial instruments	16			102	
Contingent consideration receivables	13			399	
Total financial assets		**21 839**	**1 215**	**1 323**	
Interest-bearing accounts of associates payable on demand	21	1 836			
Bank and other short-term financial debt	21	719			
Commercial paper	21	2 289			
Straight bonds	19	22 167			
Long-term liabilities to banks and other financial institutions	19	188			
Trade payables		5 424			
Contingent consideration liabilities (see Note 20/22) and other financial liabilities				1 065	
Derivative financial instruments	21			185	
Lease liabilities	10				1 949
Total financial liabilities		**32 623**		**1 250**	**1 949**

Derivative financial instruments

The following tables show the contract or underlying principal amounts and fair values of derivative financial instruments analyzed by type of contract at December 31, 2020 and 2019. Contract or underlying principal amounts indicate the gross volume of business outstanding at the consolidated balance sheet date and do not represent amounts at risk. The fair values are determined by reference to market prices or standard pricing models that use observable market inputs at December 31, 2020 and 2019.

	Contract or underlying principal amount		Positive fair values		Negative fair values	
(USD millions)	**2020**	2019	**2020**	2019	**2020**	2019
Forward foreign exchange rate contracts	13 679	10 779	151	96	– 165	– 75
Commodity purchase contract	11	9	8	6		
Options on equity securities	70	269			– 29	– 110
Total derivative financial instruments included in marketable securities and in current financial debts	**13 760**	**11 057**	**159**	**102**	**– 194**	**– 185**

The following table shows by currency contract or underlying principal amount the derivative financial instruments at December 31, 2020 and 2019:

(USD millions)	2020 EUR	USD	Other	Total
Forward foreign exchange rate contracts	2 432	6 376	4 871	13 679
Commodity purchase contract		11		11
Options on equity securities		70		70
Total derivative financial instruments	**2 432**	**6 457**	**4 871**	**13 760**

	2019			
(USD millions)	EUR	USD	Other	Total
Forward foreign exchange rate contracts	1 373	7 760	1 646	10 779
Commodity purchase contract		9		9
Options on equity securities		250	19	269
Total derivative financial instruments	**1 373**	**8 019**	**1 665**	**11 057**

Derivative financial instruments effective for hedge accounting purposes

At the end of 2020 and 2019, there were no open hedging instruments for anticipated transactions.

Fair value by hierarchy

As required by IFRS, financial assets and liabilities recorded at fair value in the consolidated financial statements are categorized based upon the level of judgment associated with the inputs used to measure their fair value. There are three hierarchical levels, based on increasing subjectivity associated with the inputs to derive fair valuation for these assets and liabilities, which are as follows:

The assets carried at Level 1 fair value are equity and debt securities listed in active markets.

The assets generally included in Level 2 fair value hierarchy are foreign exchange and interest rate derivatives, and certain debt securities. Foreign exchange and interest rate derivatives are valued using corroborated market data. The liabilities generally included in this fair value hierarchy consist of foreign exchange and interest rate derivatives.

Level 3 inputs are unobservable for the asset or liability. The assets generally included in Level 3 fair value hierarchy are various investments in hedge funds and unquoted equity security investments. Contingent consideration carried at fair value is included in this category.

	2020			
(USD millions)	Level 1	Level 2	Level 3	Total
Financial assets				
Debt securities		26		26
Total marketable securities		**26**		**26**
Derivative financial instruments		159		159
Total marketable securities and derivative financial instruments		**185**		**185**
Debt and equity securities	1 153		460	1 613
Fund investments			366	366
Contingent consideration receivables			625	625
Total long-term financial investments	**1 153**		**1 451**	**2 604**
Associated companies at fair value through profit and loss			**211**	**211**
Financial liabilities				
Contingent consideration payables			– 1 046	– 1 046
Other financial liabilities			– 23	– 23
Derivative financial instruments		– 194		– 194
Total financial liabilities at fair value		**– 194**	**– 1 069**	**– 1 263**

(USD millions)	2019 Level 1	Level 2	Level 3	Total
Financial assets				
Debt securities		24		24
Fund investments	37			37
Total marketable securities	**37**	**24**		**61**
Derivative financial instruments		102		102
Total marketable securities and derivative financial instruments	**37**	**126**		**163**
Debt and equity securities	976		581	1 557
Fund investments			233	233
Contingent consideration receivables			399	399
Total long-term financial investments	**976**		**1 213**	**2 189**
Associated companies at fair value through profit and loss			**186**	**186**
Financial liabilities				
Contingent consideration payables			– 1 036	– 1 036
Other financial liabilities			– 29	– 29
Derivative financial instruments		– 185		– 185
Total financial liabilities at fair value		**– 185**	**– 1 065**	**– 1 250**

The change in carrying values associated with Level 3 financial instruments, using significant unobservable inputs during the year ended December 31, is set forth below:

(USD millions)	2020 Associated companies at fair value through profit and loss	Fund investments	Long-term financial investments	Contingent consideration receivables	Contingent consideration payables	Other financial liabilities
January 1	**186**	**233**	**581**	**399**	**– 1 036**	**– 29**
Fair value gains and other adjustments, including from divestments recognized in the consolidated income statement	57	151	34	173	206	
Fair value losses (including impairments and amortizations) and other adjustments recognized in the consolidated income statement	– 18	– 8	– 39		– 90	– 3
Fair value adjustments recognized in the consolidated statement of comprehensive income, including currency translation effects	4	3	33	40	– 62	– 2
Purchases	24	17	123	43	– 123	
Cash receipts and payments				– 30	63	11
Disposals	– 23	– 61	– 109			
Reclassification	– 19	31	– 163		– 4	
December 31	**211**	**366**	**460**	**625**	**– 1 046**	**– 23**
Total of fair value gains and losses recognized in the consolidated income statement for assets and liabilities held at December 31, 2020	39	143	– 5	173	116	– 3

(USD millions)	2019					
	Associated companies at fair value through profit and loss	Fund investments	Long-term financial investments	Contingent consideration receivables	Contingent consideration payables	Other financial liabilities
January 1	**145**	**251**	**488**	**396**	**– 907**	**– 10**
Impact from discontinued operations [1]		– 28	– 19		163	
Fair value gains and other adjustments, including from divestments recognized in the consolidated income statement		12	6	35	195	1
Fair value losses (including impairments and amortizations) and other adjustments recognized in the consolidated income statement	– 15				– 89	– 48
Fair value adjustments recognized in the consolidated statement of comprehensive income			– 6			
Purchases	49	28	229		– 401	– 5
Cash receipts and payments				– 32	3	33
Disposals	– 3	– 30	– 53			
Reclassification	10		– 64			
December 31	**186**	**233**	**581**	**399**	**– 1 036**	**– 29**
Total of fair value gains and losses recognized in the consolidated income statement for assets and liabilities held at December 31, 2019	– 15	12	6	35	106	– 47

[1] Notes 1, 2 and 30 provide information related to discontinued operations.

During 2020, there were several individually non-significant transfers of financial investments from Level 3 to Level 1 for USD 166 million (2019: USD 64 million), mainly due to initial public offerings of the invested companies.

Realized gains and losses associated with Level 3 long-term financial investments measured at fair value through the consolidated income statement are recorded in the consolidated income statement under "Other income" or "Other expense," respectively. Realized gains and losses associated with Level 3 long-term financial investments measured at fair value through other comprehensive income are not recycled through the consolidated income statement but are instead reclassified to retained earnings.

During the year, the net loss and net gain recorded on associated companies, fund investments and long-term financial investments at fair value through profit and loss were USD 92 million and USD 427 million, respectively.

If the pricing parameters for the Level 3 input were to change for associated companies at fair value through profit and loss, fund investments and long-term financial investments by 10% positively or negatively, this would change the amounts recorded in the 2020 consolidated statement of comprehensive income by USD 104 million.

To determine the fair value of a contingent consideration, various unobservable inputs are used. A change in these inputs might result in a significantly higher or lower fair value measurement. The inputs used are, among others, the probability of success, sales forecast and assumptions regarding the discount rate and timing and different scenarios of triggering events. The inputs are interrelated. The significance and usage of these inputs to each contingent consideration may vary due to differences in the timing and triggering events for payments or in the nature of the asset related to the contingent consideration.

If the most significant parameters for the Level 3 input were to change by 10% positively or negatively, or where the probability of success (POS) is the most significant input parameter, 10% were added or deducted from the applied probability of success, for contingent consideration payables, other financial liabilities and contingent consideration receivables, this would change the amounts recorded in the 2020 consolidated income statement by USD 260 million and USD 324 million, respectively.

Equity securities measured at fair value through other comprehensive income

Equity securities held as strategic investments, typically held outside the Novartis Venture Fund, are generally designated at date of acquisition as financial assets valued at fair value through other comprehensive income with no subsequent recycling through profit and loss. Except for the investment in Alcon Inc. with a fair value of USD 71 million at December 31, 2020 (2019: USD 382 million), these are made up of individually non-significant investments. At December 31, 2020, the Group holds 56 non-listed equity securities (December 31, 2019: 53) and 34 listed equity securities (December 31, 2019: 29) in this category with the following fair values:

(USD millions)	**2020**	2019
Listed equity securities	862	843
Non-listed equity securities	249	315
Total equity securities	**1 111**	**1 158**

There were no dividends recognized during 2020 and 2019 from these equity securities. In 2020, in accor-

dance with the consolidated foundations Alcon Inc. shares divestment plans, Alcon Inc. shares with a fair value of USD 331 million were sold (2019: USD 976 million), and the USD 13 million gain on disposal (2019: USD 62 million gain) was transferred from other comprehensive income to retained earnings during 2020. In addition, in 2020, equity securities that were no longer considered strategic, with a fair value of USD 206 million (2019: USD 33 million), were sold, and the USD 137 million gain on disposal (2019: USD 33 million gain) was transferred from other comprehensive income to retained earnings (see Note 8).

Nature and extent of risks arising from financial instruments

Market risk

Novartis is exposed to market risk, primarily related to foreign currency exchange rates, interest rates, and the market value of the investments of liquid funds. The Group actively monitors and seeks to reduce, where it deems it appropriate to do so, fluctuations in these exposures. It is the Group's policy and practice to enter into a variety of derivative financial instruments to manage the volatility of these exposures and to enhance the yield on the investment of liquid funds. It does not enter into any financial transactions containing a risk that cannot be quantified at the time the transaction is concluded. In addition, it does not sell short assets it does not have, or does not know it will have, in the future. The Group only sells existing assets or enters into transactions and future transactions (in the case of anticipatory hedges) that it confidently expects it will have in the future, based on past experience. In the case of liquid funds, the Group writes call options on assets it has, or writes put options on positions it wants to acquire and has the liquidity to acquire. The Group expects that any loss in value for these instruments generally would be offset by increases in the value of the underlying transactions.

Foreign currency exchange rate risk

The Group uses the US dollar as its reporting currency. As a result, the Group is exposed to foreign currency exchange movements, primarily in European, Japanese and emerging market currencies. Fluctuations in the exchange rates between the US dollar and other currencies can have a significant effect on both the Group's results of operations, including reported sales and earnings, as well as on the reported value of our assets, liabilities and cash flows. This, in turn, may significantly affect the comparability of period-to-period results of operations.

Because our expenditures in Swiss francs are significantly higher than our revenues in Swiss francs, volatility in the value of the Swiss franc can have a significant impact on the reported value of our earnings, assets and liabilities, and the timing and extent of such volatility can be difficult to predict.

There is also a risk that certain countries could devalue their currency. If this occurs, it could impact the effective prices we would be able to charge for our products and also have an adverse impact on both our consolidated income statement and balance sheet.

Subsidiaries whose functional currencies have experienced a cumulative inflation rate of more than 100% over the past three years apply the rules of IAS 29 "Financial reporting in Hyperinflationary Economies". The hyperinflationary economies in which Novartis operates are Argentina and Venezuela. Venezuela was hyperinflationary for all years presented, and Argentina became hyperinflationary effective July 1, 2018, requiring retroactive implementation of hyperinflation accounting as of January 1, 2018. The impacts of applying IAS 29 were not significant in all years presented.

The Group manages its global currency exposure by engaging in hedging transactions where management deems appropriate. Novartis may enter into various contracts that reflect the changes in the value of foreign currency exchange rates to preserve the value of assets, commitments and anticipated transactions. Novartis also uses forward contracts and foreign currency option contracts to hedge.

Net investments in subsidiaries in foreign countries are long-term investments. Their fair value changes through movements of foreign currency exchange rates. The Group has designated a certain portion of its long-term euro-denominated straight bonds as hedges of the translation risk arising on certain of these net investments in foreign operations with euro functional currency. As of December 31, 2020, long-term financial debt with a carrying amount of EUR 1.8 billion (USD 2.3 billion) (December 31, 2019: USD 2.1 billion), has been designated as a hedge instrument. During 2020, USD 201 million of unrealized loss (unrealized income in 2019: USD 44 million) was recognized in other comprehensive income and accumulated in currency translation effects in relation with this net investment hedge. The hedge remained effective since inception, and no amount was recognized in the consolidated income statement in 2020, 2019 and 2018.

Commodity price risk

The Group has only a very limited exposure to price risk related to anticipated purchases of certain commodities used as raw materials by the Group's businesses. A change in those prices may alter the gross margin of a specific business, but generally by not more than 10% of the margin and thus below the Group's risk management tolerance levels. Accordingly, the Group does not enter into significant commodity futures, forward or option contracts to manage fluctuations in prices of anticipated purchases.

Interest rate risk

The Group addresses its net exposure to interest rate risk mainly through the ratio of its fixed-rate financial debt to variable-rate financial debt contained in its total financial debt portfolio. To manage this mix, Novartis may enter into interest rate swap agreements, in which it exchanges periodic payments based on a notional amount and agreed-upon fixed and variable interest rates.

Equity risk

The Group may purchase equities as investments of its liquid funds. As a policy, it limits its holdings in an unrelated company to less than 5% of its liquid funds. Poten-

tial investments are thoroughly analyzed. Call options are written on equities that the Group owns, and put options are written on equities that the Group wants to buy and for which cash is available.

Credit risk

Credit risks arise from the possibility that customers may not be able to settle their obligations as agreed. To manage this risk, the Group periodically assesses country and customer credit risk, assigns individual credit limits, and takes actions to mitigate credit risk where appropriate.

The provisions for expected credit losses for customers are based on a forward-looking expected credit loss, which includes possible default events on the trade receivables over the entire holding period of the trade receivables.

In measuring the expected credit losses, trade receivables are grouped based on shared credit risk characteristics (such as private versus public receivables) and days past due. In determining the expected credit loss rates, the Group considers current and forward-looking macroeconomic factors that may affect the ability of the customers to settle the receivables, and historical loss rates for each category of customers.

The Group's largest customer accounted for approximately 17% of net sales, and the second largest and third largest customers accounted for 11% and 6% of net sales, respectively (2019: 18%, 13% and 8%, respectively; 2018: 18%, 14% and 8%, respectively).

The highest amounts of trade receivables outstanding were for these same three customers and amounted to 14%, 12% and 6%, respectively, of the Group's trade receivables at December 31, 2020 (2019: 14%, 12% and 7%, respectively). There is no other significant concentration of customer credit risk.

Counterparty risk

Counterparty risk encompasses issuer risk on marketable securities and money market instruments; credit risk on cash, time deposits and derivatives; as well as settlement risk for different instruments. Issuer risk is reduced by only buying securities that are at least A- rated. Counterparty credit risk and settlement risk are reduced by a policy of entering into transactions with counterparties (banks or financial institutions) that feature a strong credit rating. Exposure to these risks is closely monitored and kept within predetermined parameters. The limits are regularly assessed and determined based upon credit analysis, including financial statement and capital adequacy ratio reviews. In addition, reverse repurchasing agreements are contracted, and Novartis has entered into credit support agreements with various banks for derivative transactions. To further reduce the settlement risk, the Group has implemented a multi-currency system, CLS (Continuous Linked Settlement), providing multilateral netting (payment-versus-payment settlement) of cash flows from foreign exchange transactions.

The Group's cash and cash equivalents are held with major regulated financial institutions; the three largest ones hold approximately 14.1%, 12.6% and 9.7%, respectively (2019: 12.6%, 10.4% and 8.3%, respectively).

The Group does not expect any losses from non-performance by these counterparties and does not have any significant grouping of exposures to financial sector or country risk.

Liquidity risk

Liquidity risk is defined as the risk that the Group could not be able to settle or meet its obligations associated with financial liabilities that are settled by delivering cash or another financial asset. Group Treasury is responsible for liquidity, funding and settlement management. In addition, liquidity and funding risks, and related processes and policies, are overseen by management. Novartis manages its liquidity risk on a consolidated basis according to business needs and tax, capital or regulatory considerations, if applicable, through numerous sources of financing in order to maintain flexibility.

Certain countries have legal or economic restrictions on the ability of subsidiaries to transfer funds to the Group in the form of cash dividends, loans or advances, but these restrictions do not have an impact on the ability of the Group to meet its cash obligations.

Management monitors the Group's net debt or liquidity position through rolling forecasts on the basis of expected cash flows.

Novartis has two US commercial paper programs under which it can issue up to USD 9.0 billion in the aggregate of unsecured commercial paper notes. Novartis also has a Japanese commercial paper program under which it can issue up to JPY 150 billion (approximately USD 1.5 billion) of unsecured commercial paper notes. Commercial paper notes totaling USD 4.3 billion under these three programs were outstanding as per December 31, 2020 (2019: USD 2.3 billion). Novartis further has a committed credit facility of USD 6.0 billion, which was renewed in September 2019. This credit facility is provided by a syndicate of banks and is intended to be used as a backstop for the US commercial paper programs. The facility matures in September 2024 and was undrawn as per December 31, 2020, and December 31, 2019.

In December 2019, Novartis entered into a short-term credit facility of USD 7 billion, with a maturity date of June 30, 2020 with a syndicate of banks. On January 7, 2020, Novartis borrowed USD 7 billion under the facility with interest based on the USD LIBOR. On February 14, 2020, Novartis repaid the full USD 7 billion initially borrowed. The facility expired on June 30, 2020.

The following table sets forth how management monitors net debt or liquidity based on details of the remaining contractual maturities of current financial assets and liabilities, excluding trade receivables and payables as well as contingent considerations at December 31, 2020, and December 31, 2019:

	2020					
(USD millions)	Due within one month	Due later than one month but less than three months	Due later than three months but less than one year	Due later than one year but less than five years	Due after five years	Total
Current assets						
Marketable securities, time deposits and short-term investments with original maturity more than 90 days	13	1 571	25	5	21	1 635
Commodities					111	111
Derivative financial instruments and accrued interest	38	110	4	4	3	159
Cash and cash equivalents	8 558	1 100				9 658
Total current financial assets	**8 609**	**2 781**	**29**	**9**	**135**	**11 563**
Non-current liabilities						
Financial debt				– 10 621	– 15 638	– 26 259
Financial debt – undiscounted				*– 10 661*	*– 15 802*	*– 26 463*
Total non-current financial debt				**– 10 621**	**– 15 638**	**– 26 259**
Current liabilities						
Financial debt	– 4 195	– 2 218	– 3 178			– 9 591
Financial debt – undiscounted	*– 4 195*	*– 2 219*	*– 3 179*			*– 9 593*
Derivative financial instruments	– 93	– 84	– 17			– 194
Total current financial debt	**– 4 288**	**– 2 302**	**– 3 195**			**– 9 785**
Net debt	**4 321**	**479**	**– 3 166**	**– 10 612**	**– 15 503**	**– 24 481**

	2019					
(USD millions)	Due within one month	Due later than one month but less than three months	Due later than three months but less than one year	Due later than one year but less than five years	Due after five years	Total
Current assets						
Marketable securities, time deposits and short-term investments with original maturity more than 90 days	20	26	16	3	57	122
Commodities					110	110
Derivative financial instruments and accrued interest	14	79	3	3	3	102
Cash and cash equivalents	9 712	1 400				11 112
Total current financial assets	**9 746**	**1 505**	**19**	**6**	**170**	**11 446**
Non-current liabilities						
Financial debt				– 9 110	– 11 243	– 20 353
Financial debt – undiscounted				*– 9 150*	*– 11 355*	*– 20 505*
Total non-current financial debt				**– 9 110**	**– 11 243**	**– 20 353**
Current liabilities						
Financial debt	– 4 243	– 1 373	– 1 230			– 6 846
Financial debt – undiscounted	*– 4 243*	*– 1 373*	*– 1 230*			*– 6 846*
Derivative financial instruments	– 130	– 29	– 26			– 185
Total current financial debt	**– 4 373**	**– 1 402**	**– 1 256**			**– 7 031**
Net debt	**5 373**	**103**	**– 1 237**	**– 9 104**	**– 11 073**	**– 15 938**

The consolidated balance sheet amounts of financial liabilities included in the above analysis are not materially different to the contractual amounts due on maturity. The positive and negative fair values on derivative financial instruments represent the net contractual amounts to be exchanged at maturity.

The Group's contractual undiscounted potential cash flows from derivative financial instruments to be settled on a gross basis are as follows:

	2020			
(USD millions)	Due within one month	Due later than one month but less than three months	Due later than three months but less than one year	Total
Derivative financial instruments and accrued interest on derivative financial instruments				
Potential outflows in various currencies – from financial derivative liabilities	– 930	– 4 096	– 719	– 5 745
Potential inflows in various currencies – from financial derivative assets	904	4 114	710	5 728

	2019			
(USD millions)	Due within one month	Due later than one month but less than three months	Due later than three months but less than one year	Total
Derivative financial instruments and accrued interest on derivative financial instruments				
Potential outflows in various currencies – from financial derivative liabilities	– 814	– 4 624	– 952	– 6 390
Potential inflows in various currencies – from financial derivative assets	807	4 656	922	6 385

Other contractual liabilities that are not part of management's monitoring of the net debt or liquidity consist of the following items:

	2020				
(USD millions)	Due within three months	Due later than three months but less than one year	Due later than one year but less than five years	Due after five years	Total
Contractual interest on non-current liabilities	– 82	– 468	– 1 846	– 4 251	– 6 647
Lease liabilities	– 77	– 209	– 692	– 1 027	– 2 005
Trade payables	– 5 239	– 164			– 5 403
Commitment for repurchase of own shares	– 1 769				– 1 769
Contingent consideration liabilities	– 24	– 38	– 639	– 345	– 1 046

	2019				
(USD millions)	Due within three months	Due later than three months but less than one year	Due later than one year but less than five years	Due after five years	Total
Contractual interest on non-current liabilities	– 36	– 428	– 1 531	– 3 439	– 5 434
Lease liabilities	– 65	– 181	– 622	– 1 081	– 1 949
Trade payables	– 5 222	– 202			– 5 424
Contingent consideration liabilities	– 62	– 9	– 582	– 383	– 1 036

Capital risk management

Novartis strives to maintain a strong credit rating. In managing its capital, Novartis focuses on maintaining a strong balance sheet. As of December 31, 2020, Moody's Investor Service rated the Company A1 for long-term maturities and P-1 for short-term maturities and S&P Global Ratings rated the company AA- for long-term maturities and A-1+ for short-term maturities.

Value at risk

The Group uses a value at risk (VAR) computation to estimate the potential 10-day loss in the fair value of its financial instruments.

A 10-day period is used because of an assumption that not all positions could be undone in one day given the size of the positions. The VAR computation includes

all financial assets and financial liabilities as set forth in the table on page F-69, except:

- Trade receivables
- Other current assets
- Long-term loans and receivables, advances and security deposits
- Contingent considerations
- Lease liabilities
- Commitment for repurchase of own shares
- Trade payables

The VAR estimates are made assuming normal market conditions, using a 95% confidence interval. The Group uses a "Delta Normal" model to determine the observed interrelationships between movements in interest rates, stock markets and various currencies. These interrelationships are determined by observing interest rate movements, stock market movements and foreign currency rate movements over a 60-day period for the calculation of VAR amounts.

The estimated potential 10-day loss in the fair value of the Group's foreign currency positions (including foreign exchange translation risk), the estimated potential 10-day loss of its equity holdings, and the estimated potential 10-day loss in fair value of its interest rate-sensitive instruments (primarily financial debt and investments of liquid funds under normal market conditions), as calculated in the VAR model, are the following:

(USD millions)	**2020**	2019
All financial instruments	587	355
Analyzed by components:		
Instruments sensitive to foreign currency exchange rates	199	89
Instruments sensitive to equity market movements	62	31
Instruments sensitive to interest rates	197	187

The average, high and low VAR amounts are as follows:

	2020		
(USD millions)	Average	High	Low
All financial instruments	568	659	322
Analyzed by components:			
Instruments sensitive to foreign currency exchange rates	225	515	71
Instruments sensitive to equity market movements	78	261	21
Instruments sensitive to interest rates	329	912	173

	2019		
(USD millions)	Average	High	Low
All financial instruments	348	385	303
Analyzed by components:			
Instruments sensitive to foreign currency exchange rates	143	195	86
Instruments sensitive to equity market movements	36	81	16
Instruments sensitive to interest rates	233	303	187

The VAR computation is a risk analysis tool designed to statistically estimate the potential 10-day loss from adverse movements in foreign currency exchange rates, equity prices and interest rates under normal market conditions. The computation does not purport to represent actual losses in fair value on earnings to be incurred by the Group, nor does it consider the effect of favorable changes in market rates. The Group cannot predict actual future movements in such market rates, and it does not claim that these VAR results are indicative of future movements in such market rates or are representative of any actual impact that future changes in market rates may have on the Group's future results of operations or financial position.

30. Discontinued operations

Discontinued operations include the operational results from the Alcon eye care devices business and certain Corporate activities attributable to the Alcon business prior to the spin-off, the gain on distribution of Alcon Inc. to Novartis AG shareholders, and certain other expenses related to the Distribution (refer to Notes 1 and 2 for further details).

The Alcon eye care devices business researched, discovered, developed, manufactured, distributed and sold a broad range of eye care products. Alcon was organized into two global business franchises, Surgical and Vision Care. Alcon also provided services, training, education and technical support for both the Surgical and Vision Care businesses.

Consolidated income statement

(USD millions)	2019[1]	2018
Net sales to third parties from discontinued operations	**1 777**	**7 149**
Sales to continuing segments	32	4
Net sales from discontinued operations	**1 809**	**7 153**
Cost of goods sold	– 860	– 3 983
Gross profit from discontinued operations	**949**	**3 170**
Selling, general and administration	– 638	– 2 754
Research and development	– 142	– 585
Other income	15	61
Other expense	– 113	– 126
Operating income/(loss) from discontinued operations	**71**	**– 234**
Interest expense	– 10	– 25
Other financial income and expense	– 3	– 1
Income/(loss) before taxes from discontinued operations	**58**	**– 260**
Taxes	– 159	74
Net loss from discontinued operations before gain on distribution of Alcon Inc. to Novartis AG shareholders	**– 101**	**– 186**
Gain on distribution of Alcon Inc. to Novartis AG shareholders[2]	4 691	
Net income/(loss) from discontinued operations	**4 590**	**– 186**

[1] The consolidated income statement amounts are for the period from January 1, 2019, to the completion of the spin-off.
[2] See Note 2 for further details on the non-taxable, non-cash gain on distribution of Alcon Inc. to Novartis AG shareholders.

Supplemental disclosures related to the Alcon business distributed to Novartis AG shareholders

Additional significant accounting policies

The accounting policies mentioned in Note 1 were used for the reporting of discontinued operations. The following additional significant accounting policies were applicable to discontinued operations.

Intangible assets available for use

In addition to currently marketed products, technologies and other intangible assets (including computer software), discontinued operations intangible assets available for use also included marketing know-how and the Alcon brand name.

Marketing know-how represents the value attributable to the expertise acquired for marketing and distributing Alcon surgical products.

The Alcon brand name was shown separately, as it was the only Novartis intangible asset that was available for use with an indefinite useful life. Novartis considers that it was appropriate that the Alcon brand name had an indefinite life since Alcon-branded products had a history of strong revenue and cash flow performance, and Novartis had the intent and ability to support the brand with spending to maintain its value for the foreseeable future. The Alcon brand name was not amortized as it had an indefinite useful life, but was evaluated for potential impairment annually.

The following table shows the respective useful lives for available-for-use intangible assets and the location in the consolidated income statement in which the respective amortization and any potential impairment charge were recognized:

	Useful life	Income statement location for amortization and impairment charges
Marketing know-how	25 years	"Cost of goods sold"
Alcon brand name	Not amortized, indefinite useful life	"Other expense"

The estimates used in calculating the net present values are highly sensitive and depend on assumptions specific to the nature of the activities and more specifically on appropriate royalty rate for the Alcon brand name.

Revenue recognition

In the Alcon Division, which is reported as discontinued operations, surgical equipment may have been sold together with other products and services under a single contract. Revenues were recognized upon satisfaction of each of the performance obligations in the contract and the consideration was allocated based on the standalone selling price of each performance obligation.

For surgical equipment, in addition to cash and installment sales, revenue was recognized under finance and operating lease arrangements. Arrangements in which substantially all the risks and rewards incidental to ownership transfers to the customer were treated as finance lease arrangements. Revenue from finance lease arrangements was recognized at amounts equal to the fair value of the equipment, which approximated the present value of the minimum lease payments under the arrangements. As interest rates embedded in lease

arrangements were approximately market rates, revenue under finance lease arrangements was comparable to revenue for outright sales. Finance income for arrangements longer than 12 months was deferred and subsequently recognized based on a pattern that approximated to the use of the effective interest method and was recorded in "Other income." Operating lease revenue for equipment rentals was recognized on a straight-line basis over the lease term.

Net income

Included in net income from discontinued operations are:

(USD millions)	2019	2018
Interest income		2
Depreciation of property, plant and equipment	– 42	– 235
Depreciation of right-of-use assets	– 9	
Amortization of intangible assets	– 174	– 1 052
Impairment charges on property, plant and equipment		– 3
Impairment charges on intangible assets [1]		– 391
Additions to restructuring provisions		– 13
Equity-based compensation of Novartis equity plans	– 9	– 93

[1] 2018 includes an impairment of USD 337 million related to the write-down of the CyPass currently marketed product, which was acquired with the Alcon Division 2016 acquisition of Transcend Medical, Inc.

Balance sheet

The following were in the balance sheet from discontinued operations for the period from January 1, 2019, to the date of reclassification:

(USD millions)	2019
Additions to property, plant and equipment	113
Additions to right-of-use assets	3
Additions to goodwill and intangible assets	36

Cash flows used in investing activities from discontinued operations

Cash flows used in investing activities from discontinued operations include the investing activities of the Alcon business and cash outflows for transaction-related expenditures attributable to the series of portfolio transformation transactions completed in 2015.

(USD millions)	**2020**	2019	2018
Payments attributable to the spin-off of the Alcon business	– 39	– 29	
Divested cash and cash equivalents		– 628	
Cash flows attributable to the spin-off of the Alcon business	**– 39**	**– 657**	
Other cash flows used in investing activities, net	– 88	– 502	– 1 001
Net cash flows used in investing activities from discontinued operations	**– 127**	**– 1 159**	**– 1 001**

Cash flows from financing activities from discontinued operations

In 2020, the net cash outflows used in financing activities from discontinued operations of USD 50 million was for transaction cost payments directly attributable to the distribution (spin-off) of the Alcon business to Novartis AG shareholders.

In 2019, the net cash inflows from financing activities from discontinued operations of USD 3.3 billion (2018: USD 167 million net cash outflows) included mainly USD 3.5 billion (2018: nil) cash inflows from Alcon borrowings in connection with the distribution (spin-off) of the Alcon business to Novartis AG shareholders, partly offset by USD 0.2 billion (2018: USD 0.1 billion) transaction cost payments directly attributable to the distribution (spin-off) of the Alcon business to Novartis AG shareholders (see Notes 1 and 2).

Leases

The lease liabilities recorded in discontinued operations on January 1, 2019, the date of implementation of IFRS 16 Leases (see Note 1), were USD 286 million, and the right-of-use assets were USD 276 million, including USD

89 million and USD 75 million, respectively, for the previously reported finance lease obligations. For discontinued operations, there were no impairments or significant contract terminations of right-of-use assets for the period from January 1, 2019, to February 28, 2019, the date of shareholder approval for the Alcon spin-off.

Net assets derecognized

The following table presents the Alcon business net assets at the date of spin-off at April 8, 2019:

(USD millions)	2019
Property, plant and equipment	2 858
Right-of-use assets	269
Goodwill	8 906
Intangible assets other than goodwill	11 121
Deferred tax assets	732
Financial and other non-current assets	526
Inventories	1 469
Trade receivables and other current assets	1 787
Cash and cash equivalents	628
Deferred tax liabilities	– 1 713
Current and non-current lease liabilities	– 269
Current and non-current financial debts	– 3 538
Trade payables, provisions and other liabilities	– 2 751
Net assets derecognized	**20 025**

Defined contribution plans

In many subsidiaries, associates are covered by defined contribution plans. Contributions charged to the consolidated income statement for the defined contribution plans were:

(USD millions)	2019	2018
Contributions for defined contribution plans discontinued operations	33	104

Significant transactions

In March 2019, Alcon acquired PowerVision, Inc. (PowerVision), a privately held, US-based medical device development company focused on developing accommodative, implantable intraocular lenses. The fair value of the total purchase consideration was USD 424 million. The amount consisted of an initial cash payment of USD 289 million and the fair value of the contingent consideration of USD 135 million, due to PowerVision shareholders, which they are eligible to receive upon the achievement of specified regulatory and commercialization milestones. The purchase price allocation resulted in net identifiable assets of USD 418 million, consisting of intangible assets of USD 505 million, net deferred tax liabilities of USD 93 million, other net assets of USD 6 million, and goodwill of USD 6 million. The 2019 results of operations since the date of the acquisition were not material.

For additional information related to the distribution (spin-off) of the Alcon business to Novartis AG shareholders, effected through a dividend in kind distribution that was completed on April 8, 2019, refer to Note 1 and Note 2.

31. Events subsequent to the December 31, 2020, consolidated balance sheet date

Significant transactions not closed as of January 25, 2021
In November 2020 and in January 2021, Novartis entered into long-term research and development agreements, both of which did not close as of January 25, 2021. For additional information see Note 28.

Significant transaction closed in January 2021
In December 2020, Novartis entered into a business acquisition agreement that closed on January 21, 2021, with an estimated fair value purchase price of USD 235 million.

Dividend proposal for 2020 and approval of the Group's 2020 consolidated financial statements
On January 25, 2021, the Novartis AG Board of Directors proposed the acceptance of the 2020 consolidated financial statements of the Novartis Group for approval by the Annual General Meeting on March 2, 2021. Furthermore, also on January 25, 2021, the Board proposed a dividend of CHF 3.00 per share to be approved at the Annual General Meeting on March 2, 2021. If approved, total dividend payments would amount to approximately USD 7.7 billion (2019: USD 7.0 billion), using the CHF/USD December 31, 2020, exchange rate.

32. Principal Group subsidiaries and associated companies

The following table lists the principal subsidiaries controlled by Novartis, associated companies in which Novartis is deemed to have significant influence, and foundations required to be consolidated under IFRS. It includes all subsidiaries, associated companies and consolidated foundations with total assets or net sales to third parties in excess of USD 25 million. The equity interest percentage shown in the table also represents the share in voting rights in those entities, except where explicitly noted.

As at December 31, 2020		Share capital [1]	Equity interest
Algeria			
Société par actions SANDOZ, Algiers	DZD	650.0 m	100%
Argentina			
Novartis Argentina S.A., Buenos Aires	ARS	906.1 m	100%
Australia			
Novartis Australia Pty Ltd, Macquarie Park, NSW	AUD	2	100%
Novartis Pharmaceuticals Australia Pty Ltd, Macquarie Park, NSW	AUD	3.8 m	100%
Sandoz Pty Ltd, Macquarie Park, NSW	AUD	11.6 m	100%
Austria			
Novartis Austria GmbH, Vienna	EUR	1.0 m	100%
Novartis Pharma GmbH, Vienna	EUR	1.1 m	100%
Sandoz GmbH, Kundl	EUR	32.7 m	100%
EBEWE Pharma Ges.m.b.H Nfg. KG, Unterach am Attersee	EUR	1.0 m	100%
Bangladesh			
Novartis (Bangladesh) Limited, Gazipur	BDT	162.5 m	60%
Belgium			
Novartis Pharma NV, Vilvoorde	EUR	7.1 m	100%
Sandoz NV, Vilvoorde	EUR	19.2 m	100%
Alcon – Couvreur NV, Puurs	EUR	110.6 m	100%
Bermuda			
Novartis Investment Ltd., Hamilton	USD	12 000	100%
Novartis Securities Investment Ltd., Hamilton	CHF	30 000	100%
Novartis Finance Services Ltd., Hamilton	CHF	20 000	100%
Triangle International Reinsurance Limited, Hamilton	CHF	1.0 m	100%
Trinity River Insurance Co Ltd., Hamilton	USD	370 000	100%
Brazil			
Novartis Biociências S.A., São Paulo	BRL	265.0 m	100%
Sandoz do Brasil Indústria Farmacêutica Ltda., Cambé, PR	BRL	190.0 m	100%
Canada			
Novartis Pharmaceuticals Canada Inc., Dorval, Quebec	CAD	1.2 m	100%
Sandoz Canada Inc., Boucherville, Quebec	CAD	80.8 m	100%
Sandoz Manufacturing Inc., Boucherville, Quebec	CAD	100	100%
Chile			
Novartis Chile S.A., Santiago de Chile	CLP	2.0 bn	100%
China			
Beijing Novartis Pharma Co., Ltd., Beijing	USD	30.0 m	100%
Novartis Pharmaceuticals (HK) Limited, Hong Kong	HKD	200	100%
China Novartis Institutes for BioMedical Research Co., Ltd., Shanghai	USD	320.0 m	100%
Suzhou Novartis Technical Development Co., Ltd., Changshu	USD	12.0 m	100%
Shanghai Novartis Trading Ltd., Shanghai	USD	3.2 m	100%
Sandoz (China) Pharmaceutical Co., Ltd., Zhongshan	USD	57.6 m	100%
Colombia			
Novartis de Colombia S.A., Santafé de Bogotá	COP	7.9 bn	100%
Croatia			
Sandoz d.o.o. farmaceutska industrija, Zagreb	HRK	25.6 m	100%
Czech Republic			
Novartis s.r.o., Prague	CZK	51.5 m	100%
Sandoz s.r.o., Prague	CZK	44.7 m	100%
Denmark			
Novartis Healthcare A/S, Copenhagen	DKK	14.0 m	100%
Sandoz A/S, Copenhagen	DKK	12.0 m	100%
Ecuador			
Novartis Ecuador S.A., Quito	USD	4.0 m	100%
Egypt			
Novartis Pharma S.A.E., Cairo	EGP	193.8 m	99.77%
Sandoz Egypt Pharma S.A.E., New Cairo City	EGP	250 000	100%
Finland			
Novartis Finland Oy, Espoo	EUR	459 000	100%

As at December 31, 2020		Share capital [1]	Equity interest
France			
Novartis Groupe France S.A., Rueil-Malmaison	EUR	903.0 m	100%
Novartis Pharma S.A.S., Rueil-Malmaison	EUR	43.4 m	100%
Advanced Accelerator Applications S.A., Saint-Genis-Pouilly	EUR	76 734	99.2%
CELLforCURE, Les Ulis	EUR	4.2 m	100%
Sandoz S.A.S., Levallois-Perret	EUR	5.4 m	100%
Germany			
Novartis Deutschland GmbH, Nuremberg	EUR	155.5 m	100%
Novartis Business Services GmbH, Wehr	EUR	25 000	100%
Novartis Pharma GmbH, Nuremberg	EUR	25.6 m	100%
Novartis Pharma Produktions GmbH, Wehr	EUR	2.0 m	100%
Sandoz International GmbH, Holzkirchen	EUR	100 000	100%
1 A Pharma GmbH, Oberhaching	EUR	26 000	100%
HEXAL AG, Holzkirchen	EUR	93.7 m	100%
Salutas Pharma GmbH, Barleben	EUR	42.1 m	100%
Aeropharm GmbH, Rudolstadt	EUR	26 000	100%
Greece			
Novartis (Hellas) S.A.C.I., Metamorphosis / Athens	EUR	233.9 m	100%
Hungary			
Novartis Hungary Healthcare Limited Liability Company, Budapest	HUF	545.6 m	100%
Sandoz Hungary Limited Liability Company, Budapest	HUF	883.0 m	100%
India			
Novartis India Limited, Mumbai	INR	123.5 m	70.68%
Novartis Healthcare Private Limited, Mumbai	INR	60.0 m	100%
Sandoz Private Limited, Mumbai	INR	32.0 m	100%
Indonesia			
PT. Novartis Indonesia, Jakarta	IDR	7.7 bn	100%
Ireland			
Novartis Ireland Limited, Dublin	EUR	25 000	100%
Novartis Integrated Services Limited, Ringaskiddy, County Cork	EUR	100	100%
Novartis Ringaskiddy Limited, Ringaskiddy, County Cork	EUR	2.0 m	100%
Novartis Gene Therapies EU Limited, Dublin	EUR	100	100%
Israel			
Novartis Israel Ltd., Tel Aviv	ILS	1 000	100%
Italy			
Novartis Farma S.p.A., Origgio	EUR	18.2 m	100%
Advanced Accelerator Applications (Italy) S.r.l., Pozzilli	EUR	119 000	99.2%
Sandoz S.p.A., Origgio	EUR	1.7 m	100%
Japan			
Novartis Pharma K.K., Tokyo	JPY	6.0 bn	100%
Ciba-Geigy Japan Limited, Tokyo	JPY	8.5 bn	100%
Sandoz K.K., Tokyo	JPY	100.0 m	100%
Aspen Japan K.K. Tokyo	JPY	2.2 bn	100%
Latvia			
Novartis Baltics SIA, Riga	EUR	3.0 m	100%
Luxembourg			
Novartis Investments S.à r.l., Luxembourg City	USD	100.0 m	100%
Novartis Finance S.A., Luxembourg City	USD	100 000	100%
Malaysia			
Novartis Corporation (Malaysia) Sdn. Bhd., Kuala Lumpur	MYR	3.3 m	100%
Mexico			
Novartis Farmacéutica, S.A. de C.V., Mexico City	MXN	205.0 m	100%
Sandoz, S.A. de C.V., Mexico City	MXN	468.2 m	100%
Morocco			
Novartis Pharma Maroc SA, Casablanca	MAD	80.0 m	100%
Netherlands			
Novartis Netherlands B.V., Amsterdam	EUR	1.4 m	100%
Novartis Pharma B.V., Amsterdam	EUR	4.5 m	100%
IDB Holland BV, Baarle-Nassau	EUR	18 000	99.2%
Sandoz B.V., Almere	EUR	907 560	100%
New Zealand			
Novartis New Zealand Ltd, Auckland	NZD	820 000	100%

As at December 31, 2020		Share capital [1]	Equity interest
Norway			
Novartis Norge AS, Oslo	NOK	1.5 m	100%
Pakistan			
Novartis Pharma (Pakistan) Limited, Karachi	PKR	6.7 bn	99.99%
Panama			
Novartis Pharma (Logistics), Inc., Panama City	USD	10 000	100%
Peru			
Novartis Biosciences Perú S.A., Lima	PEN	6.1 m	100%
Philippines			
Novartis Healthcare Philippines, Inc., Makati City	PHP	298.8 m	100%
Sandoz Philippines Corporation, Makati City	PHP	30.0 m	100%
Poland			
Novartis Poland Sp. z o.o., Warsaw	PLN	44.2 m	100%
Sandoz Polska Sp. z o.o., Warsaw	PLN	25.6 m	100%
Lek S.A., Strykow	PLN	11.4 m	100%
Portugal			
Novartis Portugal, S.G.P.S., Lda., Porto Salvo	EUR	500 000	100%
Novartis Farma – Produtos Farmacêuticos, S.A., Porto Salvo	EUR	2.4 m	100%
Sandoz Farmacêutica, Lda., Porto Salvo	EUR	499 900	100%
Romania			
Novartis Pharma Services Romania S.R.L., Bucharest	RON	3.0 m	100%
Sandoz S.R.L., Targu-Mures	RON	105.2 m	100%
Russian Federation			
Novartis Pharma LLC, Moscow	RUB	20.0 m	100%
Novartis Neva LLC, St. Petersburg	RUB	500.0 m	100%
ZAO Sandoz, Moscow	RUB	57.4 m	100%
Saudi Arabia			
Novartis Saudi Ltd., Riyadh	SAR	30.0 m	100%
Singapore			
Novartis (Singapore) Pte Ltd., Singapore	SGD	100 000	100%
Novartis Singapore Pharmaceutical Manufacturing Pte Ltd, Singapore	SGD	45.0 m	100%
Novartis Asia Pacific Pharmaceuticals Pte Ltd, Singapore	SGD	39.0 m	100%
Slovakia			
Novartis Slovakia s.r.o., Bratislava	EUR	2.0 m	100%
Slovenia			
Lek Pharmaceuticals d.d., Ljubljana	EUR	48.4 m	100%
Sandoz Pharmaceuticals d.d., Ljubljana	EUR	1.5 m	100%
South Africa			
Novartis South Africa (Pty) Ltd, Midrand	ZAR	86.3 m	100%
Sandoz South Africa (Pty) Ltd, Kempton Park	ZAR	3.0 m	100%
South Korea			
Novartis Korea Ltd., Seoul	KRW	24.5 bn	98.55%
Spain			
Novartis Farmacéutica, S.A., Barcelona	EUR	63.0 m	100%
Advanced Accelerator Applications Iberica, S.L.U., Barcelona	EUR	22.6 m	99.2%
Catalana de Dispensacion sau (Cadisa), Esplugues de Llobregat	EUR	450 750	99.2%
Sandoz Farmacéutica S.A., Madrid	EUR	270 450	100%
Sandoz Industrial Products S.A., Les Franqueses del Vallés / Barcelona	EUR	9.3 m	100%
Alcon Cusi, S.A., El Masnou / Barcelona	EUR	10.1 m	100%
Abadia Retuerta S.A., Sardón de Duero / Valladolid	EUR	6.0 m	100%
Sweden			
Novartis Sverige AB, Stockholm	SEK	5.0 m	100%
Switzerland			
Novartis International AG, Basel	CHF	10.0 m	100%
Novartis Holding AG, Basel [3]	CHF	100.2 m	100%
Novartis International Pharmaceutical Investment AG, Basel	CHF	100 000	100%
Novartis Bioventures AG, Basel	CHF	100 000	100%
Novartis Forschungsstiftung, Basel [4]	--	--	--
Novartis Stiftung für Kaderausbildung, Basel [4]	--	--	--
Novartis Mitarbeiterbeteiligungsstiftung, Basel [4]	--	--	--
Novartis Stiftung für Mensch und Umwelt, Basel [4]	--	--	--
Stiftung der Novartis AG für Erziehung, Ausbildung und Bildung, Basel [4]	--	--	--
Novartis Overseas Investments AG, Basel	CHF	1.0 m	100%
Japat AG, Basel	CHF	50 000	100%
Novartis Pharma AG, Basel [3]	CHF	350.0 m	100%
Novartis Pharma Services AG, Basel	CHF	20.0 m	100%
Novartis Pharma Schweizerhalle AG, Muttenz	CHF	18.9 m	100%
Novartis Pharma Stein AG, Stein	CHF	251 000	100%
Novartis Pharma Schweiz AG, Risch	CHF	5.0 m	100%
Novartis Ophthalmics AG, Fribourg	CHF	100 000	100%
Advanced Accelerator Applications International SA, Geneva	CHF	9.3 m	99.2%
Sandoz AG, Basel	CHF	5.0 m	100%
Sandoz Pharmaceuticals AG, Risch	CHF	100 000	100%
Roche Holding AG, Basel	CHF	160.0 m	33%/6% [2]

As at December 31, 2020		Share capital [1]	Equity interest
Taiwan			
Novartis (Taiwan) Co., Ltd., Taipei	TWD	170.0 m	100%
Thailand			
Novartis (Thailand) Limited, Bangkok	THB	302.0 m	100%
Turkey			
Novartis Saglik, Gida ve Tarim Ürünleri Sanayi ve Ticaret A.S., Istanbul	TRY	98.0 m	100%
Farmanova Saglik Hizmetleri Ltd. Sti., Istanbul	TRY	6.7 m	100%
Sandoz Ilaç Sanayi ve Ticaret A.S., Istanbul	TRY	265.0 m	99.99%
Sandoz Grup Saglik Ürünleri Ilaçlari Sanayi ve Ticaret A.S., Gebze – Kocaeli	TRY	50.0 m	100%
Ukraine			
Sandoz Ukraine LLC, Kyiv	UAH	8.0 m	100%
United Arab Emirates			
Novartis Middle East FZE, Dubai	AED	7.0 m	100%
United Kingdom			
Novartis UK Limited, London	GBP	25.5 m	100%
Novartis Pharmaceuticals UK Limited, London	GBP	5.4 m	100%
Novartis Grimsby Limited, London	GBP	250.0 m	100%
Advanced Accelerator Applications (UK & Ireland), London	GBP	100	99.2%
Neutec Pharma Limited, London	GBP	7.7 m	100%
Ziarco Group Limited, London	GBP	3 904	100%
Sandoz Limited, Frimley / Camberley	GBP	2.0 m	100%
Coalesce Product Development Limited, Cambridge, Cambs	GBP	6.0 m	40%
United States of America			
Novartis Corporation, East Hanover, NJ	USD	72.2 m	100%
Novartis Finance Corporation, East Hanover, NJ [3]	USD	1 000	100%
Novartis Capital Corporation, East Hanover, NJ	USD	1	100%
Novartis Services, Inc., East Hanover, NJ	USD	1	100%
Novartis US Foundation, East Hanover, NJ [4]	--	--	--
Novartis Pharmaceuticals Corporation, East Hanover, NJ [3]	USD	650	100%
Advanced Accelerator Applications USA, Inc., Millburn, NJ	USD	1	99.2%
Novartis Gene Therapies, Inc., Bannockburn, IL	USD	1	100%
Novartis Technology LLC, East Hanover, NJ	--	--	--
Novartis Institutes for BioMedical Research, Inc., Cambridge, MA	USD	1	100%
Novartis Optogenetics Research, Inc., East Hanover, NJ	USD	1	100%
CoStim Pharmaceuticals Inc., Cambridge, MA	USD	1	100%
Endocyte, Inc., East Hanover, NJ	USD	1	100%
Navigate BioPharma Services, Inc., Carlsbad, CA	USD	1	100%
The Medicines Company, East Hanover, NJ	USD	1 000	100%
Sandoz Inc., Princeton, NJ	USD	25 000	100%
Amblyotech Inc., East Hanover, NJ	USD	50	100%
Oriel Therapeutics, Inc., Durham, NC	USD	50.0 m	100%
Fougera Pharmaceuticals Inc., Melville, NY	USD	1	100%
Eon Labs, Inc., Princeton, NJ	USD	1	100%
Novartis Vaccines and Diagnostics, Inc., East Hanover, NJ	USD	3	100%
Venezuela			
Novartis de Venezuela, S.A., Caracas	VES	14	100%
Vietnam			
Novartis Vietnam Company Limited, Ho Chi Minh City	VND	70 bn	100%

In addition, the Group is represented by subsidiaries and associated companies with total assets or net sales to third parties below USD 25 million in the following countries: Bosnia and Herzegovina, Bulgaria, Dominican Republic, Guatemala, Kenya, Kuwait, North Macedonia, Nigeria, Puerto Rico and Uruguay

[1] Share capital may not reflect the taxable share capital and does not include any paid-in surplus.

[2] Approximately 33.3% of voting shares; approximately 6.2% of total net income and equity attributable to Novartis.

[3] Significant subsidiary under SEC Regulation S-X Rule 1-02(w)

[4] Fully consolidated Foundation

m = million; bn = billion

Report of the statutory auditor

to the General Meeting of Novartis AG
Basel

Report on the audit of the consolidated financial statements

Opinion

We have audited the consolidated financial statements of Novartis AG and its subsidiaries (the "Group"), which comprise the consolidated balance sheet as at December 31, 2020 and the consolidated income statement, consolidated statement of comprehensive income, consolidated statement of changes in equity and consolidated statement of cash flows for the year then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the consolidated financial statements (pages F-1 to F-84) give a true and fair view of the consolidated financial position of the Group as at December 31, 2020 and its consolidated financial performance and its consolidated cash flows for the year then ended in accordance with International Financial Reporting Standards (IFRS) and comply with Swiss law.

Basis for opinion

We conducted our audit in accordance with Swiss law, International Standards on Auditing (ISAs) and Swiss Auditing Standards. Our responsibilities under those provisions and standards are further described in the "Auditor's responsibilities for the audit of the consolidated financial statements" section of our report.

We are independent of the Group in accordance with the provisions of Swiss law and the requirements of the Swiss audit profession, as well as the International Code of Ethics for Professional Accountants (including International Independence Standards) of the International Ethics Standards Board for Accountants (IESBA Code), and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our audit approach

Overview

- Overall Group materiality was USD 490 million, which represents approximately 5% of income before taxes from continuing operations.
- We conducted full scope audit work at the Group's two operating divisions. We also conducted full scope audit work at four reporting entities in two countries. In addition, full scope audit work on account balances or specified procedures was performed at 20 reporting entities in 12 countries.
- Our audit scope addressed 65% of the Group's net sales and 86% of Group's total assets.

As key audit matters, the following areas of focus have been identified:

- Intangible Assets Impairment Assessments – Innovative Medicines Division Currently Marketed Products
- US Managed Care, Medicare Part D and Medicaid Rebates

Materiality

The scope of our audit was influenced by our application of materiality. Our audit opinion aims to provide reasonable assurance that the consolidated financial statements are free from material misstatement. Misstatements may arise due to fraud or error. They are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the consolidated financial statements.

Based on our professional judgment, we determined certain quantitative thresholds for materiality, including the overall Group materiality for the consolidated financial statements as a whole as set out below. These, together with qualitative considerations, helped us to determine the scope of our audit and the nature, timing and extent of our audit procedures and to evaluate the effect of misstatements, if any, both individually and in aggregate, on the consolidated financial statements as a whole.

Overall Group materiality
USD 490 million

How we determined it
5% of profit before tax from continuing operations

Rationale for the materiality benchmark applied
We chose income before taxes from continuing operations as the materiality measure because, in our view, it is the measure against which the performance of the Group is most commonly assessed and is a generally accepted benchmark.

We agreed with the Audit and Compliance Committee that we would report to them misstatements identified during our audit above USD 20 million as well as any misstatements below that amount which, in our view, warranted reporting for qualitative reasons.

Audit scope

We designed our audit by determining materiality and assessing the risks of material misstatement in the consolidated financial statements. In particular, we considered areas where subjective judgments were made, such as significant accounting estimates that involved making assumptions and consideration of future events that are inherently uncertain. As in all of our audits, we also

addressed the risk of management override of internal controls, including – among other matters – consideration of whether there was evidence of bias that represented a risk of material misstatement due to fraud.

How we tailored the audit scope

We tailored the scope of our audit in order to perform sufficient work to enable us to provide an opinion on the consolidated financial statements as a whole, taking into account the structure of the Group, the accounting processes and controls, and the industry in which the Group operates.

The Group financial statements are a consolidation of over 200 reporting entities. We identified four reporting entities that, in our view, required an audit of their complete financial information due to their size or risk characteristics. We worked very closely with and received full scope reporting from the divisional audit teams for Innovative Medicines and Sandoz, each being a global business. To obtain appropriate coverage of material balances, we also received 19 full scope reports from reporting entity audit teams for the full scope audit work performed on account balances and one specified procedures report. None of the reporting entities excluded from our Group audit scope individually contributed more than 5% to net sales or total assets. Audit procedures were also performed by the Group audit team over the Group's Corporate activities, certain Group functions (including accounting for associated companies, taxation, treasury, certain employee benefits, government investigations and litigation) and Group consolidation.

To exercise the appropriate direction and supervision over the work of the divisional and reporting entity audit teams, the Group audit team reviewed audit working papers, virtually participated in meetings between the divisional and reporting entity audit teams, and virtually attended selected meetings between divisional management and divisional audit teams.

Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Intangible Assets Impairment Assessments – Innovative Medicines Division Currently Marketed Products

Key audit matter

As described in Notes 1 and 11 to the consolidated financial statements, the Group has intangible assets in its Innovative Medicines Division other than goodwill totaling USD 35.1 billion at December 31, 2020, including currently marketed products of USD 29.6 billion. The Group recognized impairments of intangible assets in its Innovative Medicines Division other than goodwill of USD 768 million during the year. In most cases, no directly observable market inputs are available to measure the fair value less costs of disposal that is used to determine if the asset is impaired. Therefore, an estimate is derived indirectly and is based on net present value techniques utilizing post-tax cash flows and discount rates. The estimates that management used in calculating the net present values depend on assumptions specific to the nature of the Innovative Medicines Division's activities with regard to the amount and timing of projected future cash flows; long-term sales forecasts; actions of competitors (launch of competing products, marketing initiatives, etc.); sales erosion rates after the end of patent or other intellectual property rights protection, and timing of the entry of generic competition; outcome of research and development activities (compound efficacy, results of clinical trials, etc.); amount and timing of projected costs to develop IPR&D into commercially viable products; profit margins; probability of obtaining regulatory approval; future tax rate; and discount rate.

The principal considerations for our determination that performing procedures relating to the intangible assets impairment assessments of the Innovative Medicines Division currently marketed products is a key audit matter are the significant judgment by management when developing the net present value of the intangible assets. This in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to the amount and timing of projected future cash flows (specifically the long-term sales forecasts and the probability of obtaining regulatory approval) and the discount rate. In addition, the audit effort involved the use of professionals with specialized skill and knowledge.

How our audit addressed the key audit matter

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's intangible assets impairment assessments, including controls over the Innovative Medicines Division currently marketed products. These procedures also included, among others, testing management's process for developing the fair value estimate; evaluating the appropriateness of the net present value techniques; testing the completeness and accuracy of underlying data used in the model; and evaluating the significant assumptions used by management, including the amount and timing of projected future cash flows and the discount rate. Evaluating management's assumptions related to the amount and timing of projected future cash flows and the discount rate involved evaluating whether the assumptions used by management were reasonable considering the current and past performance of the intangible assets, the consistency with external market and industry data, and whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in the evaluation of the discount rate.

As a result of our procedures, we did not propose any adjustments to the amount of impairment recognized in 2020. For Innovative Medicines Division currently marketed products where management determined that no impairment was required, we found that the assessments made by management were based upon reasonable assumptions, consistently applied.

US Managed Care, Medicare Part D and Medicaid Rebates

Key audit matter

As described in Note 1 and 22 to the consolidated financial statements, the consideration Novartis receives in exchange for its goods or services may be fixed or variable. Variable consideration is only recognized when it is highly probable that a significant reversal will not occur. Rebates and discounts granted to government agencies, wholesalers, retail pharmacies, managed healthcare organizations and other customers, as well as chargebacks are provisioned and recorded as a revenue deduction at the time the related revenues are recorded or when the incentives are offered. They are calculated on the basis of historical experience, regulations, the specific terms in the individual agreements, product pricing and the mix of products, contracts, channels and payors. The provision reported as of December 31, 2020 for revenue deductions amounted to USD 6.3 billion, a significant portion of which related to US Managed Care, Medicare Part D and Medicaid rebates.

The principal considerations for our determination that performing procedures relating to the US Managed Care, Medicare Part D and Medicaid rebates is a key audit matter are the significant judgment by management due to the significant measurement uncertainty involved in developing these provisions, as the provisions are based on assumptions developed using historical experience, regulations, the specific terms in the individual agreements, product pricing and the mix of products, contracts, channels and payors. This in turn led to a high degree of auditor judgment, subjectivity and effort in applying procedures relating to these assumptions.

How our audit addressed the key audit matter

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to provisions for the US Managed Care, Medicare Part D and Medicaid rebate programs, including controls over the assumptions used to estimate these rebates. These procedures also included, among others, developing an independent estimate of the rebates by utilizing third-party information on price and market conditions in the US, the terms of the specific rebate programs, and the historical trend of actual rebate claims paid; comparing the independent estimate to management's estimates; and testing rebate claims processed by the Group, including evaluating those claims for consistency with the contractual and mandated terms of the Group's rebate arrangements.

We did not identify any material differences between our expectations and the accruals, and we found the judgments made by management to be reasonable.

Other information in the Annual Report

The Board of Directors is responsible for the other information in the Annual Report. The other information comprises all information included in the Annual Report, but does not include the consolidated financial statements, the standalone financial statements and the compensation report of Novartis AG and our auditor's reports thereon.

Our opinion on the consolidated financial statements does not cover the other information in the Annual Report, and we do not express any form of assurance conclusion thereon.

In connection with our audit of the consolidated financial statements, our responsibility is to read the other information in the Annual Report and, in doing so, consider whether the other information is materially inconsistent with the consolidated financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of the Board of Directors for the consolidated financial statements

The Board of Directors is responsible for the preparation of the consolidated financial statements that give a true and fair view in accordance with IFRS and the provisions of Swiss law, and for such internal control as the Board of Directors determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, the Board of Directors is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Board of Directors either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.

Auditor's responsibilities for the audit of the consolidated financial statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Swiss law, ISAs and Swiss Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected

to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with Swiss law, ISAs and Swiss Auditing Standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made.
- Conclude on the appropriateness of the Board of Directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the Group audit. We remain solely responsible for our audit opinion.

We communicate with the Board of Directors, mostly through the Audit and Compliance Committee, regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide the Board of Directors with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, actions taken to eliminate threats or safeguards applied.

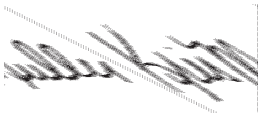
From the matters communicated with the Board of Directors, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

Report on other legal and regulatory requirements

In accordance with article 728a paragraph 1 item 3 CO and Swiss Auditing Standard 890, we confirm that an internal control system exists which has been designed for the preparation of consolidated financial statements according to the instructions of the Board of Directors.

We recommend that the consolidated financial statements submitted to you be approved.

PricewaterhouseCoopers AG



Luc Schulthess
Audit Expert
Auditor in charge

Kris Muller
Global relationship partner

Basel, January 25, 2021

Financial statements of Novartis AG

Income statements

(For the years ended December 31, 2020 and 2019)

(CHF millions)	Note	2020	2019
Income from investment in Group subsidiaries		8 882	15 318
License income		217	221
Other income		2	2
Total income		9 101	15 541
Amortization of goodwill	3	– 252	– 474
Litigation and settlement costs	4	– 117	
General and administrative expenses		– 13	– 13
Total expenses		– 382	– 487
Operating income		**8 719**	**15 054**
Financial income	5	466	512
Financial expenses	5	– 220	– 260
Extraordinary expenses	6	– 11	– 86
Income before taxes		**8 954**	**15 220**
Direct taxes		– 87	– 40
Net income of the year		**8 867**	**15 180**

The accompanying Notes form an integral part of these financial statements.

Balance sheets

(At December 31, 2020 and 2019)

(CHF millions)	Note	2020	2019
Assets			
Current assets			
Cash and cash equivalents		3	3
Interest-bearing current receivables			
Group subsidiaries		5 607	4 078
Other current receivables			
Group subsidiaries		62	64
Third parties			1
Total current assets		**5 672**	**4 146**
Non-current assets			
Financial assets			
Group subsidiaries		12 632	14 966
Investments			
Group subsidiaries	7	14 252	14 251
Goodwill	3	2 419	2 671
Total non-current assets		**29 303**	**31 888**
Total assets		**34 975**	**36 034**
Liabilities and equity			
Current liabilities			
Interest-bearing current liabilities			
Group subsidiaries		4 275	4 635
Other current liabilities			
Group subsidiaries		36	42
Third parties		193	4
Accrued expenses		53	118
Total current liabilities		**4 557**	**4 799**
Non-current liabilities			
Interest-bearing non-current liabilities			
Bonds	8	1 377	1 377
Non-current provisions		482	482
Total non-current liabilities		**1 859**	**1 859**
Total liabilities		**6 416**	**6 658**
Equity			
Share capital	9	**1 234**	**1 264**
Legal capital reserves – capital contribution reserve	10	**179**	**179**
General legal reserve		320	320
Legal reserve for treasury shares held by subsidiaries	11	1 389	1 984
Total legal reserves		**1 709**	**2 304**
Free reserves	12	2 256	6 949
Retained earnings		16 969	8 844
Net income of the year		8 867	15 180
Retained earnings available for distribution at the end of the year		25 836	24 024
Total unappropriated earnings and free reserves		**28 092**	**30 973**
Treasury shares held by Novartis AG	11	**– 2 655**	**– 5 344**
Total equity		**28 559**	**29 376**
Total liabilities and equity		**34 975**	**36 034**

The accompanying Notes form an integral part of these financial statements.

Notes to the financial statements of Novartis AG

1. Introduction

The financial statements of Novartis AG, with its registered office in Basel, comply with the requirements of the Swiss accounting legislation of the Swiss Code of Obligations (SCO).

Novartis AG is presenting consolidated financial statements according to IFRS. Therefore, Novartis AG has applied the exemption included in article 961d, paragraph 1 SCO, and has not prepared additional disclosures, a separate cash flow statement and a management report for SCO purposes.

Significant transactions in 2019

The Novartis AG shareholders approved the spin-off of the Alcon business at the 2019 Annual General Meeting held on February 28, 2019, subject to completion of certain conditions precedent to the distribution.

The conditions precedent to the spin-off were met, and on April 8, 2019, the spin-off of the Alcon business was effected by way of a distribution of a dividend in kind of Alcon Inc. shares to Novartis AG shareholders and ADR (American Depositary Receipt) holders ("the Distribution").

Through the Distribution, each Novartis AG shareholder received one Alcon Inc. share for every five Novartis AG shares/ADRs they held on April 8, 2019, close of business. As of April 9, 2019, the shares of Alcon Inc. are listed on the SIX Swiss Exchange (SIX) and on the New York Stock Exchange (NYSE) under the symbol "ALC."

At the date of the distribution, the book value of Alcon Inc. was CHF 17 288 million and consisted of goodwill (CHF 10 081 million), investments in Group subsidiaries (CHF 7 188 million) and cash (CHF 19 million). The Distribution was made at the book value of Alcon Inc. and was recognized as a reduction to free reserves (CHF 17 269 million) and legal capital reserves – capital contribution reserves (CHF 19 million).

2. Accounting policies

Financial income and expenses

Current assets and current liabilities denominated in foreign currencies are converted at year-end exchange rates. Realized exchange gains and losses, and all unrealized exchange losses arising from these as well as those from business transactions, are recorded net as financial income or financial expenses.

Derivative financial instruments

Derivative financial instruments are used for hedging purposes. These instruments are valued at fair value. When different accounting policies apply for the hedged item and the derivative financial instrument, hedge accounting is applied through measuring the hedged item together with the derivative financial instrument.

Financial assets

Financial assets are valued at acquisition cost less adjustments for foreign currency losses and any other impairment of value.

Investments

Investments are initially recognized at cost. Investments in Novartis Group subsidiaries are assessed annually and, in case of an impairment, adjusted to their recoverable amount within their category.

Goodwill

Goodwill is capitalized and amortized over a period of 20 years. Goodwill is reviewed for impairment on a yearly basis. If necessary, an impairment loss is recognized.

Bonds

Bonds are valued at nominal value. Any bond premium is accrued over the duration of the bond so that at maturity, the balance sheet amount will equal the amount that is due to be paid.

Provisions

Provisions are made to cover general business risks of the Group.

3. Goodwill

(CHF millions)	2020	2019
Goodwill		
January 1	**4 939**	**22 350**
Derecognition as a result of the Alcon Inc. spin-off		– 17 411
December 31	**4 939**	**4 939**
Accumulated amortization		
January 1	**– 2 268**	**– 9 124**
Accumulated amortization on assets related to derecognition as a result of the Alcon Inc. spin-off		7 330
Amortization charges	– 252	– 474
December 31	**– 2 520**	**– 2 268**
Net book value at December 31	**2 419**	**2 671**

4. Litigation and settlement costs

In 2020, Novartis resolved some legacy legal matters. Foreign Corrupt Practices Act (FCPA) investigations into Novartis are now closed, as settlements were reached with the US Department of Justice (DOJ) and the US Securities and Exchange Commission (SEC). As part of the settlements, Novartis AG agreed to pay USD 9 million to the DOJ and USD 113 million to the SEC.

The French Competition Authority (FCA) conducted an investigation into *Lucentis* against several Novartis subsidiaries. Novartis AG was jointly held liable for a fine of EUR 308 million. As *Lucentis* is not commercialized by Novartis AG itself, but by Novartis subsidiaries, Novartis AG was fully reimbursed by the operational subsidiary.

5. Financial income and expenses

	2020		2019	
(CHF millions)	Income	Expenses	Income	Expenses
Interest	466	– 215	512	– 191
Foreign exchange		– 4		– 69
Others		– 1		
Total	**466**	**– 220**	**512**	**– 260**

6. Extraordinary expenses

In 2020 and 2019, extraordinary expenses were related to the transaction costs attributable to the spin-off of Alcon Inc.

7. Investments

The principal direct and indirect subsidiaries and other holdings of Novartis AG are shown in Note 32 to the Group's consolidated financial statements.

In 2019, various participations in Group companies, including Alcon-related participations, were distributed by subsidiaries to Novartis AG, which in turn contributed them to Alcon Inc. The participation in Alcon Inc. was distributed as a dividend in kind to the Novartis AG shareholders and ADR (American Depositary Receipt) holders on April 8, 2019.

8. Bonds

Straight bonds

Coupon	Currency	Nominal amount	Issuance year	Maturity year	Issuer	Issue price	**2020 CHF millions**	2019 CHF millions
0.250%	CHF	500	2015	2025	Novartis AG, Basel, Switzerland	100.640%	501	501
0.625%	CHF	550	2015	2029	Novartis AG, Basel, Switzerland	100.502%	551	551
1.050%	CHF	325	2015	2035	Novartis AG, Basel, Switzerland	100.479%	325	325
Total straight bonds							**1 377**	**1 377**

Breakdowns by maturity

(CHF millions)	**2020**	2019
2025	501	501
After 2025	876	876
Total	**1 377**	**1 377**

Comparison of balance sheet and fair value

(CHF millions)	**2020 Balance sheet**	**2020 Fair value**	2019 Balance sheet	2019 Fair value
Straight bonds	1 377	1 470	1 377	1 454
Total	**1 377**	**1 470**	**1 377**	**1 454**

9. Share capital

	2020		2019	
	Number of shares	Share capital CHF millions	Number of shares	Share capital CHF millions
January 1	**2 527 374 820**	**1 263.7**	**2 550 624 820**	**1 275.3**
Number of shares canceled/capital reduced during the period	– 60 313 900	– 30.2	– 23 250 000	– 11.6
December 31	**2 467 060 920**	**1 233.5**	**2 527 374 820**	**1 263.7**

The Novartis AG share capital consists of registered shares with a nominal value of CHF 0.50 each.

The total share capital decreased from CHF 1 263.7 million at December 31, 2019, to CHF 1 233.5 million at December 31, 2020, due to a share capital reduction as

a result of the cancellation of 60.3 million repurchased shares with a nominal value of CHF 30.2 million. The cancellation was approved at the Annual General Meeting on February 28, 2020, and became effective on May 7, 2020. During 2019, the total share capital decreased from CHF 1 275.3 million at December 31, 2018, to CHF 1 263.7 million at December 31, 2019, due to a share capital reduction as a result of the cancellation of 23.3 million repurchased shares with a nominal value of CHF 11.6 million. The cancellation was approved at the Annual General Meeting on February 28, 2019, and became effective on May 8, 2019.

10. Legal capital reserves – capital contribution reserve

The existing capital contribution reserve of CHF 178 837 279 is intended to be fully used for Novartis AG share buy-back program, which has been approved at the Annual General Meeting on February 28, 2019. That use of the capital contribution reserve is in line with the new provisions on Swiss withholding tax applicable as of January 1, 2020, (article 4a, paragraph 4 VStG).

11. Treasury shares

	2020		2019	
	Number of shares	Legal reserve for treasury shares held by subsidiaries CHF millions	Number of shares	Legal reserve for treasury shares held by subsidiaries CHF millions
Treasury shares held by subsidiaries [1]				
January 1	**33 097 002**	**1 984**	**43 229 470**	**2 596**
Number of shares purchased/sold; reserves transferred	– 9 771 344	– 595	– 10 132 468	– 612
December 31	**23 325 658**	**1 389**	**33 097 002**	**1 984**

[1] Excluding foundations

	2020		2019	
	Number of shares	Deduction from equity for treasury shares held by Novartis AG CHF millions	Number of shares	Deduction from equity for treasury shares held by Novartis AG CHF millions
Treasury shares held by Novartis AG				
January 1	**111 621 358**	**5 344**	**74 557 458**	**1 864**
Number of shares purchased/canceled; reserves transferred	– 27 673 900	– 2 689	37 063 900	3 480
December 31	**83 947 458**	**2 655**	**111 621 358**	**5 344**

	2020		2019	
	Number of shares	Total treasury shares CHF millions	Number of shares	Total treasury shares CHF millions
Total treasury shares [1]				
January 1	**144 718 360**	**7 328**	**117 786 928**	**4 460**
Total number of shares purchased/sold or canceled; reserves transferred	– 37 445 244	– 3 284	26 931 432	2 868
December 31	**107 273 116**	**4 044**	**144 718 360**	**7 328**

[1] Excluding foundations

Novartis AG has met the legal requirements for legal reserves under articles 659 et. seq. and 663b.10 SCO for the treasury shares.

Treasury share purchases during 2020 totaled 34.3 million (2019: 62.0 million), with an average purchase price of CHF 81 (2019: CHF 88). No treasury share sales were executed during 2020 (2019: 1.7 million treasury share sales, with an average sale price of CHF 62), and share-based compensation transactions totaled 11.4 million shares (2019: 10.2 million shares).

The number of treasury shares held by the Company and its subsidiaries meet the definitions and requirements of article 659b SCO. At December 31, 2020, treasury shares held by Novartis AG and its subsidiaries totaled 107 273 116. As per the dividend payment date, Novartis AG and its subsidiaries are expected to hold 112 226 406 shares. These shares are non-dividend-bearing shares. It should be noted that within the Novartis Group's IFRS consolidated financial statements, some Novartis entities are included in the consolidation scope. These entities are mainly foundations, which do not qualify as subsidiaries in the sense of article 659b SCO.

12. Free reserves

(CHF millions)	**2020**	2019
January 1	**6 949**	**25 433**
Special distribution by way of a dividend in kind to effect the spin-off of Alcon Inc.		– 17 269
Free reserves after Alcon Inc. spin-off	**6 949**	**8 164**
Reduction due to cancellation of treasury shares (CHF 5 318 million / CHF 1 839 million of repurchased shares less their nominal value of CHF 30 million / CHF 12 million)	– 5 288	– 1 827
Transfer from legal reserve for treasury shares	595	612
December 31	**2 256**	**6 949**

13. Contingent liabilities

(CHF millions)	**Dec 31, 2020**	Dec 31, 2019
Guarantees in favor of subsidiaries to cover capital and interest of bonds, credit facilities and commercial paper programs – total maximum amount CHF 44 035 million (2019: CHF 41 356 million)	27 482	22 471
Other guarantees in favor of subsidiaries, associated companies and others – total maximum amount CHF 1 903 million (2019: CHF 1 870 million)	595	495
Total contingent liabilities	**28 077**	**22 966**

Novartis AG is part of the Swiss Novartis value-added tax (VAT) group and is therefore jointly liable for existing and future VAT claims from the Swiss Federal Tax Administration.

14. Registration, voting restrictions and major shareholders

The Company's Articles of Incorporation state that no person or entity shall be registered with the right to vote for more than 2% of the share capital, as set forth in the commercial register. In particular cases, the Board of Directors may allow exemptions from the limitation for registration in the Novartis Share Register.

According to the Novartis Share Register, shareholders who owned 2% or more of the Company's capital at December 31, 2020, and were entitled to voting rights on all of their shares, excluding treasury shares held by Novartis AG or its fully owned subsidiaries, were as follows:

	% holding of share capital Dec 31, 2020	% holding of share capital Dec 31, 2019
Shareholders registered for their own account:		
Emasan AG, Basel	3.6	3.5
UBS Fund Management (Switzerland) AG, Basel	2.3	2.1
Credit Suisse Funds AG, Zurich	2.0	<2.0
Novartis Foundation for Employee Participation, Basel	<2.0	2.1

Furthermore, there were the following other significant shareholders:

	% holding of share capital Dec 31, 2020	% holding of share capital Dec 31, 2019
Shareholders registered as nominees:		
Chase Nominees Ltd., London	9.6	10.4
The Bank of New York Mellon, New York	3.4	3.8
Through The Bank of New York Mellon, Everett	*1.7*	*2.0*
Through The Bank of New York Mellon, New York	*1.2*	*1.2*
Through The Bank of New York Mellon, SA/NV, Brussels	*0.5*	*0.6*
Nortrust Nominees Ltd., London	4.2	3.9
Shareholder acting as American Depositary Share (ADS) depositary:		
JPMorgan Chase Bank, N.A., New York	11.7	12.5

The following shareholder was disclosed through a notification filed with Novartis AG, but was not registered as of December 31, 2020, in the Novartis Share Register:

- Norges Bank (Central Bank of Norway), Oslo, which held 2.3% (2019: 2.1%)

The following shareholder was disclosed through a notification filed with Novartis AG and the SIX Swiss Exchange, but was registered with less than 2% of the share capital as of December 31, 2020, in the Novartis Share Register:

- BlackRock, Inc., New York, which held between 3% and 5%

15. Equity instrument disclosures for the Board of Directors and Executive Committee members

Share ownership requirements for Board members

The Chairman is required to own a minimum of 30 000 Novartis shares, and other members of the Board of Directors are required to own at least 5 000 Novartis shares within five years after joining the Board of Directors, to ensure their interests are aligned with those of shareholders.

Board members are prohibited from hedging or pledging their ownership positions in Novartis shares that are part of their guideline share ownership requirement, and are required to hold these shares for 12 months after retiring from the Board of Directors. As at December 31, 2020, all current and former members of the Board of Directors who were required to meet the minimum share ownership requirements did so.

Shares, ADRs and share options owned by Board members

As at December 31, 2020, no member of the Board of Directors, either individually or together with "persons closely linked"[1] to them, owned 1% or more of the outstanding shares (or ADRs) of Novartis. As at the same date, no member of the Board of Directors held any share options to purchase Novartis shares.

The total number of vested Novartis shares and ADRs owned by members of the Board of Directors and "persons closely linked"[1] to them as at December 31, 2020, and as at December 31, 2019, is shown in the table below.

Shares and ADRs owned by Board members1

	Number of shares[1 2]	
	At December 31, 2020	At December 31, 2019
Joerg Reinhardt	586 326	563 697
Enrico Vanni	28 847	26 645
Nancy C. Andrews	8 872	7 265
Ton Buechner	14 338	10 950
Patrice Bula	4 621	1 946
Srikant Datar	43 845	41 334
Elizabeth Doherty	8 744	6 765
Ann Fudge	15 201	14 114
Bridgette Heller	794	n.a
Frans van Houten	7 621	4 764
Simon Moroney	731	n.a.
Andreas von Planta	163 834	161 035
Charles L. Sawyers	12 593	10 986
William T. Winters	21 289	18 170
Total	**917 656**	**867 671**

na – not applicable

[1] Includes holdings of "persons closely linked" to Board members (see definition in "—Persons closely linked")

[2] Each share provides entitlement to one vote.

Share ownership requirements for Executive Committee members

Executive Committee members are required to own at least a minimum multiple of their annual base salary in Novartis shares or RSUs within five years of hire or promotion, as set out in the table below. In the event of a substantial rise or drop in the share price, the Board of Directors may, at its discretion, amend that time period accordingly.

Function	Ownership level
CEO	5 x base compensation
Other Executive Committee members	3 x base compensation

The determination of equity amounts against the share ownership requirements is defined to include vested and unvested Novartis shares or ADRs, and RSUs acquired under the Company's compensation plans. However, unvested matching shares granted under former matching programs, such as the Leveraged Share Savings Plan (LSSP), and any unvested PSUs are excluded. The determination also includes other shares and vested options of Novartis shares or ADRs that are owned directly or indirectly by "persons closely linked" to an Executive Committee member. The Compensation Committee reviews compliance with the share ownership guideline on an annual basis.

As at December 31, 2020, all members who have served at least five years on the Executive Committee have met or exceeded their personal Novartis share ownership requirements.

Shares, ADRs, equity rights and share options owned by Executive Committee members

As at December 31, 2020, no member of the Executive Committee, either individually or together with "persons closely linked"[1] to them, owned 1% or more of the outstanding shares (or ADRs) of Novartis. As at the same date, no member of the Executive Committee held any share options to purchase Novartis shares.

The following table shows the total number of shares, ADRs and other equity rights owned by Executive Committee members and "persons closely linked"[1] to them as at December 31, 2020, and as at December 31, 2019.

[1] "Persons closely linked" are (i) their spouse, (ii) their children below age 18, (iii) any legal entities that they own or otherwise control, and (iv) any legal or natural person who is acting as their fiduciary.

Shares, ADRs and other equity rights owned by Executive Committee members[1]

	Vested shares and ADRs	Unvested shares and other equity rights[2]	**Total at December 31, 2020**	Vested shares and ADRs	Unvested shares and other equity rights[2]	**Total at December 31, 2019**
Vasant Narasimhan	104 277	253 770	358 047	59 983	209 934	269 917
Steven Baert	69 679	80 274	149 953	39 785	96 428	136 213
Bertrand Bodson	10 403	34 062	44 465	4 600	26 529	31 129
James Bradner	69 551	124 998	194 549	21 794	150 910	172 704
Harry Kirsch	198 331	119 903	318 234	108 193	143 452	251 645
Shannon Thyme Klinger	29 128	62 679	91 807	12 193	58 633	70 826
Steffen Lang	81 714	61 682	143 396	56 063	51 565	107 628
Klaus Moosmayer	6 011	21 977	27 988	0	15 050	15 050
Susanne Schaffert	106 981	76 392	183 373	43 770	64 082	107 852
Richard Saynor	0	23 324	23 324	0	11 001	11 001
John Tsai	17 783	61 877	79 660	11 859	42 057	53 916
Marie-France Tschudin	12 300	75 848	88 148	5 500	69 793	75 293
Robert Weltevreden	2 734	42 445	45 179	150	19 137	19 287
Total[3]	**708 892**	**1 039 231**	**1 748 123**	**363 890**	**958 571**	**1 322 461**

na – not applicable.

[1] Includes holdings of "persons closely linked" to Executive Committee members (see definition in "—Persons closely linked.")

[2] Includes restricted shares, RSUs and target number of PSUs. Matching shares under the ESOP and LSSP, and target number of PSUs are disclosed pro-rata to December 31, unless the award qualified for full vesting under the relevant plan rules. Awards under all other incentive plans are disclosed in full.

[3]

Appropriation of available earnings and reserves of Novartis AG

1. Appropriation of available earnings of Novartis AG as per balance sheet and declaration of dividend

(CHF)	2020	2019
Available unappropriated earnings		
Balance brought forward	16 968 847 688	8 844 268 955
Net income of the year	8 867 439 410	15 179 937 729
Total available earnings at the disposal of the Annual General Meeting	**25 836 287 098**	**24 024 206 684**
Appropriation proposed by the Board of Directors (cash dividend)		
Payment of a gross dividend (before taxes and duties) of CHF 3.00 (2019: CHF 2.95) on 2 354 834 514 (2019: 2 393 660 246) dividend-bearing shares[1] with a nominal value of CHF 0.50 each	– 7 064 503 542	– 7 061 297 726
Total available earnings after appropriation of cash dividends	**18 771 783 556**	**16 962 908 958**
Dividend waived for additional treasury shares held by the Company		5 938 730
Balance to be carried forward after cash dividends	**18 771 783 556**	**16 968 847 688**

[1] No dividend will be declared on treasury shares held by Novartis AG or its fully owned subsidiaries.

If this proposal is approved, the dividend will be paid as from March 8, 2021. The last trading day with entitlement to receive the dividend is March 3, 2021. As from March 4, 2021, the shares will be traded ex-dividend.

2. Special distribution by way of a dividend in kind to effect the spin-off of Alcon Inc. on April 8, 2019

(CHF)	2019
Available reserves before special distribution	
Capital contribution reserves	198 385 279
Free reserves	25 432 646 806
Special distribution by way of a dividend in kind to effect the spin-off of Alcon Inc.	
Thereof appropriation from capital contribution reserves	– 19 548 000
Thereof appropriation from free reserves	– 17 269 355 019
Total distributable reserves after special distribution by way of dividend in kind to effect the spin-off of Alcon Inc.	
Capital contribution reserves	178 837 279
Free reserves	8 163 291 787

Novartis shareholders approved the proposed 100% spin-off of Alcon Inc. at the Annual General Meeting on February 28, 2019. The conditions precedent to the spin-off were met, and on April 8, 2019, the spin-off of Alcon Inc. was affected by the way of a distribution of dividend in kind of Alcon Inc. shares to Novartis AG shareholders and ADR (American Depositary Receipt) holders. Through the distribution, each Novartis AG shareholder received one Alcon Inc. share for every five dividend-bearing shares of Novartis AG/ADRs they held on April 8, 2019, close of business.

Report of the statutory auditor

to the General Meeting of Novartis AG

Basel

Report on the audit of the financial statements

Opinion

We have audited the financial statements of Novartis AG, which comprise the balance sheet as at December 31, 2020, income statement and notes to the financial statements for the year then ended, including a summary of significant accounting policies.

In our opinion, the financial statements (pages A1 to A11) as at December 31, 2020 comply with Swiss law and the company's articles of incorporation.

Basis for opinion

We conducted our audit in accordance with Swiss law and Swiss Auditing Standards. Our responsibilities under those provisions and standards are further described in the "Auditor's responsibilities for the audit of the financial statements" section of our report.

We are independent of the entity in accordance with the provisions of Swiss law and the requirements of the Swiss audit profession and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our audit approach

Materiality
The scope of our audit was influenced by our application of materiality. Our audit opinion aims to provide reasonable assurance that the financial statements are free from material misstatement. Misstatements may arise due to fraud or error. They are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

Based on our professional judgement, we determined certain quantitative thresholds for materiality, including the overall materiality for the financial statements as a whole as set out in the table below. These, together with qualitative considerations, helped us to determine the scope of our audit and the nature, timing and extent of our audit procedures and to evaluate the effect of misstatements, both individually and in aggregate, on the financial statements as a whole.

- Overall materiality: CHF 432 million
- How we determined it: With reference to our benchmark of 5% of income before taxes and for consistency with the Novartis Group consolidated financial statements, we determined materiality at CHF 432 million which is 5% of income before taxes.
- Rationale for the materiality benchmark applied: We chose income before taxes as the benchmark because, in our view, it is the benchmark against which the performance of the Group is most commonly measured, and it is a generally accepted benchmark.

We agreed with the Audit and Compliance Committee that we would report to them misstatements above CHF 18 million identified during our audit as well as any misstatements below that amount which, in our view, warranted reporting for qualitative reasons.

Audit scope
We designed our audit by determining materiality and assessing the risks of material misstatement in the financial statements. In particular, we considered where subjective judgements were made; for example, in respect of significant accounting estimates that involved making assumptions and considering future events that are inherently uncertain. As in all of our audits, we also addressed the risk of management override of internal controls, including among other matters consideration of whether there was evidence of bias that represented a risk of material misstatement due to fraud.

We tailored the scope of our audit in order to perform sufficient work to enable us to provide an opinion on the financial statements as a whole, taking into account the structure of the entity, the accounting processes and controls, and the industry in which the entity operates.

Report on key audit matters based on the circular 1/2015 of the Federal Audit Oversight Authority

We have determined that there are no key audit matters to communicate in our report.

Responsibilities of the Board of Directors for the financial statements

The Board of Directors is responsible for the preparation of the financial statements in accordance with the provisions of Swiss law and the company's articles of incorporation, and for such internal control as the Board of Directors determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board of Directors is responsible for assessing the entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Board of Directors either intends to liquidate the entity or to cease operations, or has no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Swiss law and Swiss Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Swiss law and Swiss Auditing Standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made.
- Conclude on the appropriateness of the Board of Directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the entity to cease to continue as a going concern.

We communicate with the Board of Directors, mostly through the Audit and Compliance Committee, regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide the Board of Directors with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, actions taken to eliminate threats or safeguards applied.

From the matters communicated with the Board of Directors, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

Report on other legal and regulatory requirements

In accordance with article 728a paragraph 1 item 3 CO and Swiss Auditing Standard 890, we confirm that an internal control system exists which has been designed for the preparation of financial statements according to the instructions of the Board of Directors.

We further confirm that the proposed appropriation of available earnings complies with Swiss law and the company's articles of incorporation. We recommend that the financial statements submitted to you be approved.

PricewaterhouseCoopers AG

Luc Schulthess
Audit expert
Auditor in charge

Kris Muller
Global relationship partner

Basel, January 25, 2021

NOVARTIS
Face Shield
Face Shield