Roche

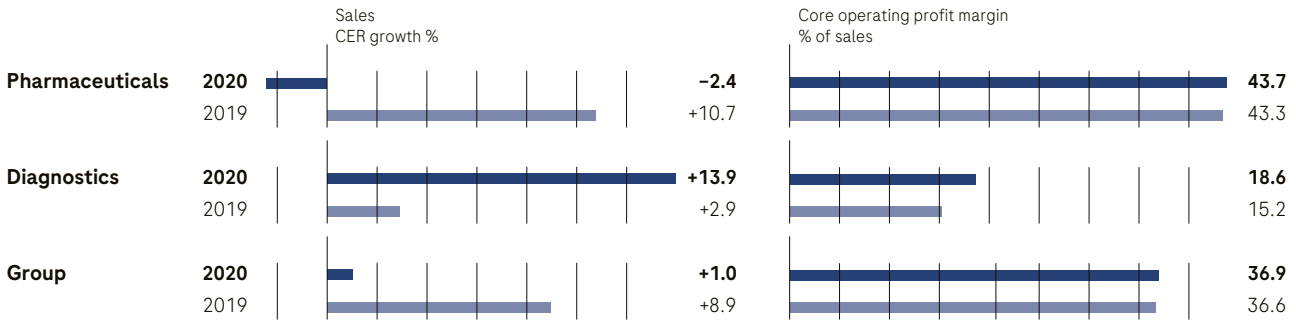
FINANCE REPORT

2020

Samsung v. Regeneron
IPR2023-00442
U.S. Pat. 10,130,681
Exhibit 2256

Finance in Brief

Key results



	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)	% of sales 2020	% of sales 2019
IFRS results						
Sales	58,323	61,466	−5	+1		
Operating profit	18,543	17,548	+6	+16	31.8	28.5
Net income	15,068	14,108	+7	+17	25.8	23.0
Net income attributable to Roche shareholders	14,295	13,497	+6	+17	24.5	22.0
Diluted EPS (CHF)	16.52	15.62	+6	+17		
Dividend per share (CHF)	9.10[a]	9.00	+1			
Core results						
Research and development	12,153	11,696	+4	+8	20.8	19.0
Core operating profit	21,536	22,479	−4	+4	36.9	36.6
Core EPS (CHF)	19.16	20.16	−5	+4		
Free cash flow						
Operating free cash flow	14,815	20,921	−29	−21	25.4	34.0
Free cash flow	10,943	16,764	−35	−26	18.8	27.3

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
Net debt	(1,882)	(2,505)	−25	−2
Capitalisation	53,989	50,230	+7	+14
– Debt	14,216	14,363	−1	+6
– Equity	39,773	35,867	+11	+17

a) Proposed by the Board of Directors.

CER (Constant Exchange Rates): The percentage changes at constant exchange rates are calculated using simulations by reconsolidating both the 2020 and 2019 results at constant exchange rates (the average rates for the year ended 31 December 2019). For the definition of CER see page 176.

Core results and Core EPS (earnings per share): These exclude non-core items such as global restructuring plans and amortisation and impairment of goodwill and intangible assets. This allows an assessment of both the actual results and the underlying performance of the business. A full income statement for the Group and the operating results of the divisions are shown on both an IFRS and core basis. The core concept is fully described on pages 168–171 and reconciliations between the IFRS and core results are given there.

Free cash flow is used to assess the Group's ability to generate the cash required to conduct and maintain its operations. It also indicates the Group's ability to generate cash to finance dividend payments, repay debt and to undertake merger and acquisition activities. The free cash flow concept is used in the internal management of the business. The free cash flow concept is fully described on pages 171–173 and reconciliations between the IFRS cash flow and free cash flow are given there.

Finance – 2020 in Brief

Roche in 2020

The **Roche Group** reported solid overall results in 2020, with the underlying business showing resilience in the pandemic environment. Sales grew by 1% at constant exchange rates (CER). IFRS net income increased by 17% (CER) and core earnings per share increased by 4% (CER). The **appreciation of the Swiss franc** against almost all currencies had an adverse impact on the results expressed in Swiss francs.

Sales

Group sales increased by 1% (CER) to CHF 58.3 billion (5% decline in CHF terms). **Pharmaceuticals sales** declined by 2% (CER) mainly due to the impact of biosimilars, notably in the US, and the impacts of the COVID-19 pandemic leading to reduced hospitalisations and outpatient visits. The growth in new medicines, led by Tecentriq, Hemlibra, Ocrevus, Perjeta and Kadcyla, and additional sales of Actemra/RoActemra, partly compensated for these declines. **Diagnostics sales** showed growth of 14% (CER), due to sales of COVID-19-related tests, notably the cobas SARS-CoV-2 PCR test and the SARS-CoV-2 Rapid Antigen test, which more than offset a decline in routine testing across the portfolio.

Operating results

Core operating profit increased by 4% (CER) to CHF 21.5 billion (4% decline in CHF terms). **Research and development** expenditure grew by 8% (CER) to CHF 12.2 billion on a core basis, despite the pandemic environment, with the focus on the oncology, neuroscience and immunology therapeutic areas. Research and development costs represented 20.8% of Group sales. **IFRS operating results** included non-core expenses (pre-tax) of CHF 3.0 billion. The major factors were CHF 1.8 billion amortisation charges for intangible assets, CHF 0.9 billion restructuring costs and CHF 0.7 billion impairment of goodwill and intangible assets. The release of litigation provisions resulted in an income of CHF 0.4 billion.

Non-operating results

Financing costs (IFRS) decreased by 41% at CER to CHF 0.6 billion due to early debt redemption losses of CHF 0.2 billion in 2019 and lower interest expenses in 2020. **Income tax expenses** (IFRS) increased by 26% at CER to CHF 2.9 billion. The effective core tax rate for 2020 increased to 17.1% mainly due to the impacts from the resolution of several tax disputes.

Net income

IFRS net income increased by 17% at CER to CHF 15.1 billion (+7% in CHF terms) driven by the operating results. **Core earnings per share** increased by 4% at CER to CHF 19.16 (–5% in CHF terms).

Cash flows

Operating free cash flow was CHF 14.8 billion, a decrease of 21% at CER. The underlying cash generation remained strong, with the decrease in CER arising from increases in net working capital and higher investments in in-licensing and alliance arrangements. **Free cash flow** decreased by 26% at CER (–35% in CHF terms) to CHF 10.9 billion, driven by the lower operating free cash flow.

Financial position

Net working capital increased by 43% (CER) driven by increases in inventories in both divisions. **Net debt** decreased by CHF 0.6 billion to CHF 1.9 billion. The free cash flow was offset by dividends paid and outflows on transactions in own equity instruments. Gross debt increased by 6% (CER) to CHF 14.2 billion. **Credit ratings** remained strong: Moody's at Aa3 and Standard & Poor's at AA.

Shareholder return

A proposal will be made to **increase dividends** by 1% to CHF 9.10 per share. This would represent the 34th consecutive year of dividend growth and would result in a pay-out ratio of 47.5%, subject to AGM approval. **Total Shareholder Return (TSR)** was 2% representing the combined performance of share and non-voting equity security.

Roche Group

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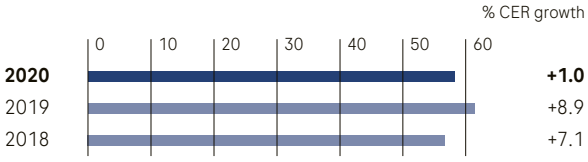
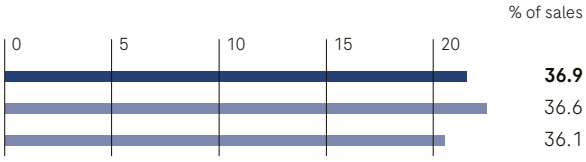
Financial Review

Roche Group results

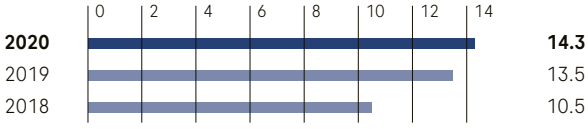
Sales in billions of CHF



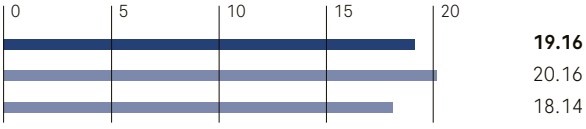
Core operating profit in billions of CHF



Net income attributable to Roche shareholders in billions of CHF



Core EPS in CHF



The COVID-19 pandemic outbreak has posed an unprecedented challenge for healthcare systems across the globe. The Roche Group has responded to this challenge with both its pharmaceuticals and diagnostics businesses. In March 2020 the Diagnostics Division launched its cobas SARS-CoV-2 PCR test. This runs on the high-volume fully automated cobas 6800 and cobas 8800 systems based on PCR technology, which are installed in major hospitals and laboratories around the world. Roche Diagnostics has also continued to complement its portfolio with point-of-care tests, such as the SARS-CoV-2 Rapid Antigen test. In the Pharmaceuticals Division, Actemra/RoActemra has been adopted by many countries in their treatment guidelines to treat patients with severe COVID-19 pneumonia, and in August 2020, the Roche Group announced that it is partnering with Regeneron to develop, manufacture and distribute its investigational neutralising antibody combination.

The Roche Group's business has so far proved to be largely resilient in this difficult environment. The pandemic has nevertheless had a negative impact on the underlying business of both of the Roche Group's divisions, with the various restrictions leading to reduced hospitalisations and outpatient visits, which has impacted routine diagnostics testing and has led to lower levels of prescriptions for many medicines, notably those that require a medical professional to make infusions or injections. At the same time, no major manufacturing supply chain issues have so far occurred and the Group's planned drug launches, filings, pivotal phase III trial readouts and pivotal trial starts are largely on track. Indeed, despite the pandemic, the Roche Group's research and development spending increased by 8%, and additionally various in-licensing transactions and asset acquisitions led to additions to intangible assets of CHF 3.9 billion in the Pharmaceuticals Division and CHF 0.4 billion in the Diagnostics Division.

In 2020 the Roche Group reported sales growth of 1% at constant exchange rates (CER) and core operating profit growth of 4%. IFRS net income increased by 17% due to the prior period including significant goodwill write-offs, while Core EPS increased by 4%. The appreciation of the Swiss franc against almost all currencies had an adverse impact on the results expressed in Swiss francs compared to constant exchange rates of 6 percentage points on sales, 8 percentage points on core operating profit and 9 percentage points on Core EPS. In the Pharmaceuticals Division, sales were 2% lower due to biosimilar erosion, which was especially pronounced in the US, and COVID-19 effects. The global uptake of new medicines continued to be strong and partly compensated for these effects. In the Diagnostics Division, sales of COVID-19-related tests totalled CHF 2.6 billion and drove the 14% increase in divisional sales, which more than offset a decline in routine testing across the portfolio.

Operating free cash flow was CHF 14.8 billion, a decrease of 21% at CER driven by increased net working capital and higher investments in in-licensing and alliance arrangements. Free cash flow at CHF 10.9 billion was lower for the same reasons. The appreciation of the Swiss franc had a significant negative impact on the free cash flows measures expressed in CHF terms. The Group has maintained sufficient liquidity to support its ongoing business activities and is well positioned to meet its financial obligations.

Divisional operating results for 2020

	Pharmaceuticals (CHF m)	Diagnostics (CHF m)	Corporate (CHF m)	Group (CHF m)
Sales	44,532	13,791	–	58,323
Core operating profit	19,477	2,564	(505)	21,536
– margin, % of sales	43.7	18.6	–	36.9
Operating profit	17,152	2,001	(610)	18,543
– margin, % of sales	38.5	14.5	–	31.8
Operating free cash flow	13,853	1,571	(609)	14,815
– margin, % of sales	31.1	11.4	–	25.4

Divisional operating results – Development of results compared to 2019

	Pharmaceuticals	Diagnostics	Corporate	Group
Sales				
– % increase at CER	–2	+14	–	+1
Core operating profit				
– % increase at CER	0	+50	+8	+4
– margin: percentage point increase	+1.1	+4.8	–	+1.2
Operating profit				
– % increase at CER	+4	Over +500	+2	+16
– margin: percentage point increase	+2.4	+14.2	–	+4.2
Operating free cash flow				
– % increase at CER	–26	+96	+13	–21
– margin: percentage point increase	–10.2	+5.4	–	–7.5

To some extent the COVID-19 pandemic negatively affected sales across the whole business as described in the following section on 'Impact of the COVID-19 pandemic'. In 2020 sales in the Pharmaceuticals Division were CHF 44.5 billion (2019: CHF 48.5 billion), a decrease of 2% at CER, which was driven by biosimilar competition, notably in the US, and the pandemic due to reduced hospitalisations and outpatient visits. The growth in new products and additional sales of Actemra/RoActemra, which grew by 32%, partly compensated for these declines. New products were a major growth driver, with Tecentriq, Hemlibra, Ocrevus, Perjeta and Kadcyla together contributing an additional CHF 3.9 billion (CER) of new sales. Tecentriq sales were 55% higher at CHF 2.7 billion, with growth in all regions. The launch and rollout of Hemlibra continued with sales reaching CHF 2.2 billion. Sales of Ocrevus were 24% higher at CHF 4.3 billion. Perjeta sales were CHF 3.9 billion, an increase of 18%, mostly due to growth in China. Kadcyla sales grew by 34% mainly due to higher demand in both the US and Europe. In the US, the first biosimilar versions of Herceptin, Avastin and MabThera/Rituxan entered the market in the second half of 2019 and US sales of these three products were CHF 3.8 billion (CER) lower in 2020. In Europe, the first biosimilar versions of Avastin came to market from mid-2020 and were a significant factor in the sales decline for Avastin in the second half of 2020.

The Diagnostics Division reported sales of CHF 13.8 billion, an increase of 14% at CER. The sales of the various COVID-19-related tests in 2020 was CHF 2.6 billion (CER). Excluding these, there was a decline in routine testing across the portfolio during the various restrictions in 2020. The major growth area was Molecular Diagnostics, which grew by 90%, driven by the cobas SARS-CoV-2 PCR test. Centralised and Point of Care Solutions sales decreased by 1%, which was attributable to a reduction in routine testing volumes during the COVID-19 pandemic, partly offset by sales of the SARS-CoV-2 Rapid Antigen test. Diabetes Care sales decreased by 5% due to the continued overall contraction of the blood glucose monitoring market as well as COVID-19 effects.

The Pharmaceuticals Division's core operating profit remained stable at CER, while sales declined by 2%. Royalty and other operating income decreased by CHF 0.2 billion due to lower product disposal gains than in the comparative period. Cost of sales decreased by 16% due to lower inventory write-offs, product mix factors, productivity improvements and lower collaboration and profit-sharing expenses. Marketing and distribution costs decreased by 8% and included activities to support ongoing product launches and rollouts, notably Tecentriq, Ocrevus and Perjeta. The cost decrease was due to reduced spending in marketing activities partly attributable to the COVID-19 pandemic, as well as lower personnel expenses. Research and development costs grew by 8%, with the oncology franchise remaining the primary area of activity, and the growth in spending being mostly driven by late-stage investments in ophthalmology, personalised healthcare and neuroscience. In 2020 there were also significant in-licensing transactions and asset acquisitions to bring external innovation into the Roche Group resulting in intangible assets additions of CHF 3.9 billion in the Pharmaceuticals Division.

In the Diagnostics Division, core operating profit increased by 50% at CER, ahead of the sales growth of 14%. Cost of sales grew by 10% due to the additional product volume and higher shipping rates. Marketing and distribution costs were stable as lower spending resulting from COVID-19 restrictions and cost containment measures was offset by higher personnel expenses and inventory write-offs. Research and development costs increased by 10% due to increased spending in COVID-19 products development, projects in cardiac disease and digital solutions.

The IFRS operating profit increased by 4% (CER) in the Pharmaceuticals Division and included CHF 0.4 billion of income following the release of various litigation provisions. The IFRS operating profit increased by CHF 1.8 billion in the Diagnostics Division, with prior-year figures including goodwill impairment charges of CHF 0.8 billion relating to the Diabetes Care business. The 2020 results include CHF 2.4 billion for the amortisation and impairment of intangible assets and CHF 0.9 billion of expenses from global restructuring plans.

Operating free cash flow was CHF 14.8 billion, a decrease of 21% at CER due to an increase in net working capital and higher investments in in-licensing and alliance arrangements. The developments in sales in 2020 had a negative impact on the operating free cash flow in the Pharmaceuticals Division, while the Diagnostics Division saw an improvement in cash generation. The free cash flow was CHF 10.9 billion, a decrease of 26% at CER. This was due to the lower operating free cash flow. When expressed in CHF terms, the free cash flows measures show a strong negative impact from the appreciation of the Swiss franc.

Financing costs decreased by 41% (CER) on an IFRS basis at CHF 0.6 billion due to early debt redemption losses of CHF 0.2 billion in 2019 and lower interest expenses in the current year attributable to the early repayment of debt in the second half of 2019. The Group's effective core tax rate increased to 17.1% compared to 16.3% in 2019. This was mainly due to the impact from the resolution of several tax disputes which reduced the Group's effective core tax rate by 1.5 percentage points in 2020 and 2.1 percentage points in 2019.

Net income increased by 17% at CER on an IFRS basis to CHF 15.1 billion and by 5% on a core basis to CHF 17.4 billion, driven in both cases by the operating results. The amount of net income attributable to non-controlling interests increased by 29% on an IFRS basis and by 27% on a core basis, due to the increased contribution of Chugai to the overall Group results.

Income statement

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
IFRS results				
Sales	58,323	61,466	–5	+1
Royalties and other operating income	2,020	2,285	–12	–8
Revenue	**60,343**	**63,751**	**–5**	**+1**
Cost of sales	(16,177)	(18,351)	–12	–7
Marketing and distribution	(9,572)	(10,960)	–13	–8
Research and development	(13,009)	(12,774)	+2	+6
General and administration	(3,042)	(4,118)	–26	–23
Operating profit	**18,543**	**17,548**	**+6**	**+16**
Financing costs	(553)	(993)	–44	–41
Other financial income (expense)	(25)	59	–	–
Profit before taxes	**17,965**	**16,614**	**+8**	**+19**
Income taxes	(2,897)	(2,506)	+16	+26
Net income	**15,068**	**14,108**	**+7**	**+17**
Attributable to				
– Roche shareholders	14,295	13,497	+6	+17
– Non-controlling interests	773	611	+27	+29
EPS – Basic (CHF)	16.73	15.77	+6	+17
EPS – Diluted (CHF)	16.52	15.62	+6	+17
Core results [a]				
Sales	58,323	61,466	–5	+1
Royalties and other operating income	2,020	2,285	–12	–8
Revenue	**60,343**	**63,751**	**–5**	**+1**
Cost of sales	(14,567)	(16,363)	–11	–6
Marketing and distribution	(9,361)	(10,513)	–11	–6
Research and development	(12,153)	(11,696)	+4	+8
General and administration	(2,726)	(2,700)	+1	+6
Operating profit	**21,536**	**22,479**	**–4**	**+4**
Financing costs	(539)	(962)	–44	–41
Other financial income (expense)	(25)	59	–	–
Profit before taxes	**20,972**	**21,576**	**–3**	**+6**
Income taxes	(3,594)	(3,514)	+2	+10
Net income	**17,378**	**18,062**	**–4**	**+5**
Attributable to				
– Roche shareholders	16,577	17,416	–5	+4
– Non-controlling interests	801	646	+24	+27
Core EPS – Basic (CHF)	19.40	20.35	–5	+4
Core EPS – Diluted (CHF)	19.16	20.16	–5	+4

a) See pages 168–171 for the definition of core results and Core EPS.

Impact of the COVID-19 pandemic

Roche medicines and diagnostic tests

Tests that detect the virus. In March 2020 the cobas SARS-CoV-2 PCR test to detect an active infection with SARS-CoV-2 received US FDA Emergency Use Authorization and became available in markets accepting the CE mark. Hospitals and reference laboratories can run the test on Roche Diagnostics' high-volume fully automated cobas 6800 and cobas 8800 systems based on PCR technology, which are installed in major hospitals and laboratories around the world.

In September 2020 the SARS-CoV-2 Rapid Antigen test for use in point-of-care settings for both symptomatic and asymptomatic people was launched in markets accepting the CE mark. This test can help healthcare professionals identify a SARS-CoV-2 infection in people suspected to carry the virus with results typically ready in 15 minutes. In addition, it serves as a valuable initial screening test for individuals that have been exposed to SARS-CoV-2-infected patients or a high-risk environment.

In September 2020 the cobas SARS-CoV-2 & Influenza A/B test for use on the cobas 6800/8800 systems received US FDA Emergency Use Authorization and became available in markets accepting the CE mark. This test is also available on the cobas Liat systems in the point-of-care setting. In December 2020 the high-throughput Elecsys SARS-CoV-2 Antigen test, an automated laboratory assay intended as an aid in the diagnosis of active SARS-CoV-2 infection, was launched in markets accepting the CE mark and a filing was also made for US FDA Emergency Use Authorization.

Tests that detect immune response. In May 2020 the Elecsys Anti-SARS-CoV-2 antibody test received US FDA Emergency Use Authorization and became available in markets accepting the CE mark. The test is designed to help determine if a patient has developed antibodies against SARS-CoV-2 after exposure to the virus. The tests can be run on Roche Diagnostics' cobas e analysers, which are widely available around the world.

In September 2020 the Elecsys Anti-SARS-CoV-2 S antibody test was launched in markets accepting the CE mark, and US FDA Emergency Use Authorization was subsequently received. This immunology test, which targets antibodies against the spike protein, can be used to quantitatively measure antibodies in people who have been exposed to SARS-CoV-2 and can play an important part in characterising a vaccine-induced immune response.

The 2020 sales of the various COVID-19-related tests was CHF 2.6 billion (CER). Sales of the cobas SARS-CoV-2 PCR tests, combined with other COVID-19-related tests in Molecular Diagnostics, were CHF 2.1 billion (CER). The launch of the SARS-CoV-2 Rapid Antigen test in late September combined with other related tests in Centralised and Point of Care Solutions reached CHF 0.5 billion (CER).

Investigating treatment options. Actemra/RoActemra has been adopted by many countries in their treatment guidelines to treat patients with severe COVID-19 pneumonia. Since March 2020 the Pharmaceuticals Division has initiated three global phase III clinical trials investigating the safety and efficacy of Actemra/RoActemra (tocilizumab) in COVID-19-associated pneumonia. Results of the COVACTA and EMPACTA studies have been published or submitted for publication in a peer-reviewed journal and have been uploaded on data sharing platforms. Following initial interactions with health authorities, the Pharmaceuticals Division will continue to monitor the evolving clinical evidence for Actemra/RoActemra in this setting, including in combination with an antiviral (remdesivir), in the ongoing phase III REMDACTA study. In addition to these trials, there are other independently led clinical trials on multiple medicines including Actemra/RoActemra that are taking place around the world such as the REMAP-CAP and the RECOVERY trials in the UK. At the time of writing, Actemra/RoActemra is not approved in the clinical treatment of COVID-19 pneumonia. Sales of Actemra/RoActemra in 2020 were CHF 2.9 billion, an increase of 32% compared to an increase of 8% in 2019.

Partnerships and collaborations. In August 2020, the Group announced that it is partnering with Regeneron Pharmaceuticals, Inc. ('Regeneron') to develop, manufacture and distribute casirivimab and imdevimab, an investigational neutralising antibody combination. In addition to being investigated in non-hospitalised patients, casirivimab and imdevimab are currently being studied in a phase II/III clinical trial for the treatment of COVID-19 in hospitalised patients, the phase III open-label RECOVERY trial of hospitalised patients in the UK, and a phase III trial for the prevention of COVID-19 in household contacts of infected individuals. Under the terms of the agreement, Regeneron will distribute casirivimab and imdevimab in the US and the Roche Group will be responsible for distribution outside the US. In November 2020 Regeneron announced that its antibody combination had received Emergency Use Authorization in the US.

In October 2020, the Group announced that it is also partnering with Atea Pharmaceuticals, Inc. ('Atea') to develop, manufacture and distribute AT-527, an investigational novel oral antiviral. A phase II study for the treatment of hospitalised patients with moderate COVID-19 is ongoing and a phase II in the outpatient setting has started in January 2021. In addition, AT-527 may be developed for post-exposure prophylactic settings.

In December 2020, the Group announced a partnership with Moderna, Inc. ('Moderna') to utilise the Elecsys Anti-SARS-CoV-2 S antibody test in Moderna's mRNA-1273 vaccine research trials. This will facilitate the quantitative measurement of SARS-CoV-2 antibodies and help to establish a correlation between vaccine-induced protection and levels of anti-receptor binding domain (RBD) antibodies.

Impact on the Roche Group's business and results

Revenues. The COVID-19 pandemic had an impact on the Group's revenues, both on the absolute amounts and in the phasing during 2020. The following factors affected sales across the whole portfolio in the Pharmaceuticals and Diagnostics businesses, although the impact varied by product and by geography:

- The restrictions on local travel and public gatherings discouraged some patients from visiting physicians, health practices and hospitals. This especially affected elderly patients.
- Many hospitals and health practices experienced a certain level of disruption leading to delays or cancellations of patient visits, especially for non-critical procedures.
- There was a certain level of forward purchasing in the first quarter of 2020 as doctors wrote prescriptions for longer periods to minimise patient visits to pharmacies, and as patients and distributors stocked up in anticipation of restrictions and potential supply chain disruptions.

These factors manifested in a higher level of sales prior to restrictions being imposed, followed by a lower level of sales during the second quarter of 2020 and then a slow recovery beginning at the end of the second quarter as restrictions were progressively eased in certain countries. This recovery continued through the third quarter of the year, however the reimposition of restrictions in many countries in the fourth quarter had a negative effect on the recovery.

Quarterly development of 2020 sales compared to 2019 year-on-year growth in % at CER

	Q1	Q2	Q3	Q4	Full Year
Pharmaceuticals Division	+7	–6	–4	–7	**–2**
Diagnostics Division	+5	+2	+18	+28	**+14**
Roche Group	**+7**	**–4**	**+1**	**+1**	**+1**

In the Pharmaceuticals Division the overall impact of COVID-19 was negative, with the various restrictions leading to reduced hospitalisations and outpatient visits, which has impacted routine diagnostic testing and has led to lower levels of prescriptions for many medicines. This was partly compensated by additional sales of Actemra/RoActemra (+32%). The negative impacts were strongest for medicines where regular visits to health practices or hospitals are needed, for example for infusions or injections. Sales of Lucentis in the US (–16%), Ocrevus (+24%) and the oncology portfolio (–10%) were therefore particularly affected, although the oncology portfolio was also heavily impacted by biosimilar erosion. The ongoing rollouts of Tecentriq (+55%) and Hemlibra (+68%) continued strongly, although the uptake of Hemlibra was also impacted to some extent by the pandemic.

In the Diagnostics Division the pandemic had a negative impact on sales across the whole portfolio, but this was more than compensated for by sales of the COVID-19-related tests, notably the cobas SARS-CoV-2 PCR test and the SARS-CoV-2 Rapid Antigen test. The pandemic led to a reduction in overall diagnostic testing, which translated into reduced instrument placements in the laboratory solutions business and reduced sales of reagents and consumables. The delivery of COVID-19-related tests led to a certain build-up in inventories as at 31 December 2020, notably the recently launched SARS-CoV-2 Rapid Antigen test. The sales of the various COVID-19-related tests in 2020 was CHF 2.6 billion (CER).

Manufacturing and supply. Despite some of the supply and logistics challenges due to the COVID-19 pandemic, the Roche Group has been able to continue to deliver medicines and diagnostics wherever possible for patients across a broad range of other disease areas under exceptional conditions. To date there has been limited disruption and the Group is continually monitoring the situation. While a certain level of volatility in purchasing patterns was noted during 2020, this has not significantly impacted the supply chain.

With the announcement of new clinical trials, and a potential increase in demand for Actemra/RoActemra, the Pharmaceuticals Division has ramped up its manufacturing capacity to increase the globally available supply. Manufacturing investments were also made in relation to the partnership with Regeneron. In total the additional capital expenditure related to the COVID-19-related projects in the Pharmaceuticals Division was CHF 90 million. While the Roche Group is ensuring a coordinated, global overview of additional supply requests, provision of medicines is managed on a country level according to local rules and regulations and in close collaboration with the authorities.

The Diagnostics Division has ramped up production capacity and supply chain for all COVID-19-related testing products with further scale-up as fast as possible. The additional capital expenditure in the Diagnostics Division was CHF 137 million. The Roche Group is committed to delivering as many tests as possible within the limits of supply and delivering its tests to areas where they can be immediately effective. Tests will be shipped from production sites to locations where appropriate infrastructure is in place and testing can begin without delay.

Research and development. The Roche Group's planned drug launches, filings, pivotal phase III trial readouts and pivotal trial starts are largely on track. The Group is continuously monitoring all ongoing studies, both in terms of missed doses and overall data integrity. The Group's development teams are taking significant efforts to protect these studies with continued support from health authorities, but the ultimate impact will also depend on the length and severity of the pandemic. Should the pandemic have a prolonged duration then the launch of new clinical trials and the progress of ongoing clinical trials may be delayed by restrictions at medical facilities and by patients deferring visits or simply not volunteering.

Operating results. The major impact on the operating profit came from the above-mentioned factors for revenues. Overall operating expenses were impacted to some extent by the COVID-19 pandemic, but the various impacts were partly offsetting. While some additional costs were incurred for areas such as IT infrastructure and distribution costs, there was less spending on travel and congresses. In particular, the 6% decline in marketing and distribution costs was driven by a general slowdown in marketing activities, including lower travel costs and reduced attendance at congresses. There were no significant costs for idle manufacturing capacity or inventory write-offs that could be attributed directly to the pandemic, and construction projects incurred only minor costs for delays during restrictions.

Core results. The Group has not made any changes to its core results concept as a result of the COVID-19 pandemic. The specific COVID-19-related impacts referred to above are included in both the IFRS and core results. It should be noted that the core results exclude non-core items such as global restructuring plans and amortisation and impairment of goodwill and intangible assets, regardless of the cause.

Liquidity and financial position

The liquidity and financial position of the Roche Group remained sound during this exceptional period.

Liquidity. The Group continues to show strong cash generation ability with free cash flow of CHF 10.9 billion. The 26% decrease at CER in free cash flow compared to 2019 was partly due to investments in in-licensing and alliance arrangements, which resulted in a cash outflow of CHF 3.6 billion. Roche continues to enjoy strong long-term investment-grade credit ratings of AA by Standard & Poor's and Aa3 by Moody's. The Group has committed credit lines with various financial institutions totalling USD 7.5 billion available as back-stop lines for the commercial paper program. As at 31 December 2020 no debt has been drawn under these credit lines. The Group did not renegotiate any major contracts for liquidity reasons. The Group did not observe a significant increase in credit risk in 2020 due to the COVID-19 pandemic. Bad debt expenses and overdue receivables remained at relatively low levels.

Financial position as at 31 December 2020. As described previously, there were no significant bad debts or write-offs of inventories that could be directly attributed to COVID-19 factors. Intangible asset impairment charges of CHF 0.3 billion were incurred as a result of a delay in clinical trials, partly caused by COVID-19, for the Spark Therapeutics' haemophilia A programme. No other impairment issues were noted for goodwill and intangible assets that can be directly attributed to the pandemic.

No impairment issues that can be directly attributed to the pandemic were noted for financial assets, although the volatility in global markets had a corresponding impact on the carrying value of investments held at fair value. Similarly, there was a certain volatility in the fair value of pension assets and discount rates during the first half of 2020, but the situation had largely stabilised by the end of the year, and no exceptional funding payments to the Group's pension plans are currently foreseen.

Group results (continued)

Mergers and acquisitions

Spark Therapeutics. On 17 December 2019 the Group acquired a 100% controlling interest in Spark Therapeutics, Inc. ('Spark Therapeutics'), a publicly owned US company based in Philadelphia, Pennsylvania, that had been listed on Nasdaq Stock Market. Spark Therapeutics is a fully integrated commercial company committed to discovering, developing and delivering gene therapies. Spark Therapeutics is reported in the Pharmaceuticals Division. The cash purchase consideration was USD 4.8 billion (equivalent to CHF 4.7 billion). In the 2019 Annual Financial Statements, the allocation of the purchase price recorded in the balance sheet was provisional. During the first half of 2020 the identification and valuation of intangible assets and other assets and liabilities was completed. Accordingly, the provisional amounts recorded in the balance sheet at 31 December 2019 were restated as set out in Note 6 to the Annual Financial Statements. As a result, the values for intangible assets were increased by CHF 2.4 billion, deferred tax assets by CHF 0.3 billion and deferred tax liabilities by CHF 0.5 billion, with a consequent decrease in goodwill of CHF 2.2 billion.

Asset acquisitions. In 2020 Roche Group acquired a 100% controlling interest in Promedior, Inc. ('Promedior'), Inflazome Ltd. ('Inflazome'), TMEM16A Ltd. ('TMEM16A'), and Lexent Bio, Inc. ('Lexent Bio') for the Pharmaceuticals Division and Stratos Genomics, Inc. ('Stratos Genomics') for the Diagnostics Division. The total initial cash consideration was CHF 1.2 billion and additional contingent payments may be made based upon the achievement of performance-related milestones. Of this CHF 0.4 billion related to the Promedior asset acquisition, by which the Group obtained rights to Promedior's entire portfolio including phase III-ready asset PRM-151, a recombinant human pentraxin-2 molecule for the treatment of idiopathic pulmonary fibrosis (IPF). A further CHF 0.4 billion related to the Inflazome asset acquisition, by which the Group obtained full rights to Inflazome's entire portfolio which is composed of clinical and preclinical orally available small molecule NLRP3 inhibitors. These transactions did not qualify as business combinations under IFRS 3 and have been accounted for as additions to intangible assets. The cash flows from business combinations and asset acquisitions, including the settlement of contingent consideration arrangements, do not form part of the free cash flow.

Further details are given in Note 6 to the Annual Financial Statements.

Alliance transactions

During 2020 the Group completed the licensing agreement with Sarepta Therapeutics, Inc. ('Sarepta') that was announced on 23 December 2019 and under which the Group acquired the exclusive rights to launch and commercialise SRP-9001, Sarepta's investigational micro-dystrophin gene therapy for Duchenne muscular dystrophy (DMD) outside the US. The initial payments resulted in the recognition of CHF 0.8 billion of intangible assets and CHF 0.3 billion of equity investments.

On 14 July 2020 the Group announced a collaboration with Blueprint Medicines Corporation ('Blueprint Medicines') for the co-development and co-commercialisation rights for pralsetinib (Gavreto), an investigational, precision therapy in late-stage development for people with RET-altered non-small cell lung cancer (NSCLC), various types of thyroid cancer and other solid tumours. Under the terms of the agreement, the Group made initial payments of CHF 0.8 billion, of which CHF 0.7 billion were recognised as intangible assets and CHF 0.1 billion as an equity investment. The parties will co-commercialise pralsetinib in the US while the Group will be responsible for commercial activities outside the US. Gavreto was approved in the US for the treatment of adults with metastatic RET-fusion-positive NSCLC in September 2020 and for the treatment of people with advanced or metastatic RET-mutant and RET-fusion-positive thyroid cancers in December 2020.

On 19 August 2020 the Group entered into a licensing agreement with Regeneron Pharmaceuticals, Inc. ('Regeneron'). The parties will collaborate on developing and manufacturing Regeneron's investigational COVID-19 antibody combination of casirivimab and imdevimab, which is in late-stage clinical trials for the treatment and prevention of SARS-CoV-2 infection. Under the terms of the agreement, each company has committed to dedicate a certain manufacturing capacity to casirivimab and imdevimab each year. Regeneron will distribute casirivimab and imdevimab in the US and the Group will be responsible for distribution outside the US. There were no initial payments. In November 2020 Regeneron announced that its antibody combination of casirivimab and imdevimab received Emergency Use Authorization in the US.

On 22 October 2020 the Group entered into a licensing agreement with Atea Pharmaceuticals, Inc. ('Atea') under which the parties will co-develop AT-527, Atea's orally administered direct-acting small molecule antiviral for COVID-19 patients. An initial payment of CHF 0.3 billion was recognised as intangible asset. If approved, Atea will distribute AT-527 in the US, with the option to request the Group's support, and the Group will be responsible for global manufacturing and distribution outside the US.

Other significant transactions included an upfront payment of CHF 0.2 billion to Arrakis Therapeutics for a strategic collaboration and licensing agreement for the discovery of RNA-targeted small molecule (rSM) drugs against a broad set of targets across all of the Pharmaceutical Division's research and development areas. There was also an upfront payment of CHF 0.2 billion to Vaccibody AS for a worldwide collaboration and licensing agreement to develop DNA-based individualised neoantigen cancer vaccines based on VB10.NEO across multiple tumour types. In addition there was also an upfront payment of CHF 0.1 billion to Vividion Therapeutics for rights to Vividion's proteomics screening platform and proprietary small molecule library to target novel E3 ligases, as well as a range of oncology and immunology therapeutic targets. An upfront payment of CHF 0.1 billion was to UCB for rights to UCB's investigational monoclonal antibody drug being developed as a potential treatment for patients with Alzheimer's Disease.

In total in-licensing and alliance transactions completed in 2020 resulted in intangible assets of CHF 3.1 billion being recognised (2019: CHF 1.6 billion). The total cash outflow of CHF 3.6 billion included the Sarepta and Blueprint Medicines equity investments as well as a payment of CHF 0.2 billion relating to the 2019 Dicerna Pharmaceuticals transaction for treatments of chronic hepatitis B virus infection. Of this total amount, CHF 3.1 billion was included in the Pharmaceuticals Division's operating free cash flow, CHF 0.1 billion in the Diagnostics Division's operating free cash flow and the CHF 0.4 billion Sarepta and Blueprint Medicines equity investments was included in the free cash flow from treasury activities.

For all the above transactions, additional payments may be made based upon the achievement of performance-related milestones and from profit-sharing and royalty arrangements.

Global restructuring plans

During 2020 the Group continued with the implementation of various global restructuring plans initiated in prior years.

Global restructuring plans: costs incurred in 2020 in millions of CHF

	Diagnostics	Site consolidation	Other plans	Total
Global restructuring costs				
– Employee-related costs	83	143	427	653
– Site closure costs	46	(34)	44	56
– Divestment of products and businesses	(3)	0	0	(3)
– Other reorganisation expenses	56	20	127	203
Total global restructuring costs	**182**	**129**	**598**	**909**
Additional costs				
– Impairment of goodwill	0	0	0	0
– Impairment of intangible assets	0	0	0	0
– Legal and environmental cases	0	0	0	0
Total costs	**182**	**129**	**598**	**909**

Diagnostics Division. Strategy plans in the Diagnostics Division incurred costs of CHF 100 million, mainly for employee-related costs.

Site consolidation. Employee-related costs were mainly for the optimisation of enabling functions within the drug product network. Other site closure costs included an impairment reversal of CHF 42 million.

Other global restructuring plans. Major items included employee-related costs of CHF 427 million, mainly for the outsourcing of operational activities to the global shared service centres and external providers as well as to driving business transformation and efficiency gains.

In 2019 total global restructuring costs were CHF 1.2 billion. Further details are given in Note 7 to the Annual Financial Statements.

Impairment of goodwill and intangible assets

Pharmaceuticals Division. The Pharmaceuticals Division recorded impairment charges to intangible assets of CHF 0.4 billion. The major part was an impairment charge of CHF 0.3 billion coming from the partial impairment of the intangible asset for SPK-8011, a novel gene therapy for the treatment of haemophilia A, acquired as part of the Spark Therapeutics acquisition. The impairment was a result of a delay in clinical trials, partly impacted by the COVID-19 pandemic, leading to reduced sales expectations. In addition, there was a charge of CHF 0.1 billion related to the partial impairment of the product intangible asset for Luxturna, a marketed gene therapy for the treatment of patients with inherited retinal disease due to mutations in both copies of the RPE65 gene, which was acquired as part of the Spark Therapeutics acquisition. This impairment was a result of reduced sales expectations.

Diagnostics Division. There were impairment charges of CHF 0.2 billion relating to the goodwill from the AVL Medical Instruments and GeneWeave acquisitions as detailed in Note 9 to the Annual Financial Statements. There were no other impairments of intangible assets in the Diagnostics Division.

In 2019 there were impairment charges of CHF 0.6 billion in the Pharmaceuticals Division. The Diagnostics Division recorded impairment charges of CHF 1.1 billion. The major part of this was a charge of CHF 0.8 billion for the partial write-off of goodwill related to the Diabetes Care business.

Further details are given in Notes 9 and 10 to the Annual Financial Statements.

Legal and environmental cases

Based on the development of the various litigations, notably the Accutane case in the US, some of the provisions previously held were released which resulted in an income of CHF 0.4 billion. There were no other significant developments affecting the 2020 financial results. Further details are given in Note 20 to the Annual Financial Statements.

Net income and earnings per share

IFRS net income increased by 7% in CHF terms and by 17% at CER while Core EPS increased by 4% at CER and decreased by 5% in CHF. The core basis excludes non-core items such as global restructuring costs, amortisation and impairment of goodwill and intangible assets, and mergers and acquisitions and alliance arrangements. The amount of net income attributable to non-controlling interests increased by 29% on an IFRS basis, and by 27% on a core basis, due to the increased contribution of Chugai to the overall Group results.

Net income

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
IFRS net income	**15,068**	**14,108**	**+7**	**+17**
Reconciling items (net of tax)				
– Global restructuring plans	741	970	–24	–21
– Intangible asset amortisation	1,268	1,380	–8	–4
– Goodwill and intangible asset impairment	578	1,570	–63	–61
– Mergers and acquisitions and alliance transactions	4	(52)	–	–
– Legal and environmental cases	(271)	417	–	–
– Pension plan settlements	(2)	(1)	–	–
– Transitional effect of Swiss tax reform	0	(236)	–100	–100
– Normalisation of equity compensation plan tax benefit	(8)	(94)	–91	–91
Core net income	**17,378**	**18,062**	**–4**	**+5**

Supplementary net income and EPS information is given on pages 168 to 171. This includes calculations of Core EPS and reconciles the core results to the Group's published IFRS results.

Financial position

Financial position

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
Pharmaceuticals				
Net working capital	2,454	1,441	+70	+87
Long-term net operating assets[a)]	31,017	29,348	+6	+12
Diagnostics				
Net working capital	2,977	2,742	+9	+15
Long-term net operating assets	10,787	11,036	–2	+3
Corporate				
Net working capital	(229)	(240)	–5	–2
Long-term net operating assets	43	(5)	–	–
Net operating assets[a)]	**47,049**	**44,322**	**+6**	**+13**
Net debt	(1,882)	(2,505)	–25	–2
Lease liabilities	(1,195)	(1,219)	–2	+5
Pensions	(6,864)	(6,535)	+5	+7
Income taxes[a)]	1,576	1,080	+46	+55
Other non-operating assets, net	1,089	724	+50	+50
Total net assets	**39,773**	**35,867**	**+11**	**+17**

a) Provisional 2019 balance sheet amounts restated for final accounting of Spark Therapeutics acquisition (see Note 6 to the Annual Financial Statements).

Compared to the start of the year the Swiss franc appreciated against almost all currencies, with the US dollar having a strong effect and, additionally, the Japanese yen and the Brazilian real having a significant effect on the Group's net operating assets. This had a negative translation impact, which was partly offset at Group level by the natural hedge from the Group's US dollar-denominated debt. The exchange rates used are given on page 36.

Net working capital increased significantly in both divisions. In the Pharmaceuticals Division inventories increased driven by active management to ensure product availability and by launch supply. The net liability position for other receivables/payables decreased due to the settlement of accruals recorded at the end of 2019. In the Diagnostics Division inventories increased due to the ongoing rollout of COVID-19-related products, notably the recently launched SARS-CoV-2 Rapid Antigen test, while trade receivables increased due to the sales growth. Overall long-term net operating assets increased due to in-licensing and alliance arrangements, and also due to asset acquisitions. These added CHF 3.9 billion in the Pharmaceuticals Division and CHF 0.4 billion in the Diagnostics Division to intangible assets, partly offset by impairments of goodwill and intangible assets.

The decrease in net debt was driven by the free cash flow of CHF 10.9 billion, offset by the annual dividend payments of CHF 8.0 billion and outflows on transactions in own equity instruments of CHF 2.1 billion. The net pension liability was 7% higher following a decrease in discount rates in most regions. The net tax assets increased mainly due to taxes paid exceeding the income tax expenses and the deferred tax effects of the pension plans. Lease liabilities of CHF 1.2 billion increased by 5% mainly due to additional office space rented by Flatiron Health.

Free cash flow

Free cash flow

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
Pharmaceuticals	13,853	20,536	–33	–26
Diagnostics	1,571	963	+63	+96
Corporate	(609)	(578)	+5	+13
Operating free cash flow	**14,815**	**20,921**	**–29**	**–21**
Treasury activities	(636)	(614)	+4	+9
Taxes paid	(3,236)	(3,543)	–9	–4
Free cash flow	**10,943**	**16,764**	**–35**	**–26**

See pages 171–173 for the definition of free cash flow and a detailed breakdown.

The Group's operating free cash flow for 2020 was CHF 14.8 billion, a decrease of 21% at CER. This was due to increased net working capital and higher investments in in-licensing and alliance arrangements. In the Pharmaceuticals Division the lower sales and the increased research and development spending had a negative impact on the operating free cash flow, partly offset by lower spending on marketing and distribution. In the Diagnostics Division the sales growth had a positive impact on the operating free cash flow. The free cash flow in 2020 was CHF 10.9 billion, a decrease of 26% at CER, due to the lower operating free cash flow and higher financial long-term investments, partly offset by lower interest paid and lower taxes paid.

Pharmaceuticals Division operating results

Pharmaceuticals Division operating results

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
IFRS results				
Sales	44,532	48,516	–8	–2
Royalties and other operating income	1,959	2,198	–11	–7
Revenue	**46,491**	**50,714**	**–8**	**–3**
Cost of sales	(9,483)	(11,593)	–18	–14
Marketing and distribution	(6,796)	(7,905)	–14	–10
Research and development	(11,421)	(11,221)	+2	+6
General and administration	(1,639)	(2,049)	–20	–17
Operating profit	**17,152**	**17,946**	**–4**	**+4**
– margin, % of sales	38.5	37.0	+1.5	+2.4
Core results[a]				
Sales	44,532	48,516	–8	–2
Royalties and other operating income	1,959	2,198	–11	–7
Revenue	**46,491**	**50,714**	**–8**	**–3**
Cost of sales	(8,070)	(10,180)	–21	–16
Marketing and distribution	(6,633)	(7,604)	–13	–8
Research and development	(10,597)	(10,228)	+4	+8
General and administration	(1,714)	(1,687)	+2	+6
Core operating profit	**19,477**	**21,015**	**–7**	**0**
– margin, % of sales	43.7	43.3	+0.4	+1.1
Financial position				
Net working capital	2,454	1,441	+70	+87
Long-term net operating assets[c]	31,017	29,348	+6	+12
Net operating assets[c]	**33,471**	**30,789**	**+9**	**+16**
Free cash flow[b]				
Operating free cash flow	13,853	20,536	–33	–26
– margin, % of sales	31.1	42.3	–11.2	–10.2

a) See pages 168–171 for the definition of core results.
b) See pages 171–173 for the definition of free cash flow.
c) Provisional 2019 balance sheet amounts restated for final accounting of Spark Therapeutics acquisition (see Note 6 to the Annual Financial Statements).

Sales overview

Pharmaceuticals Division – Sales by therapeutic area

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Oncology	23,323	27,571	–10	52.4	56.8
Immunology	8,228	8,514	+3	18.5	17.5
Neuroscience	4,937	4,358	+21	11.1	9.0
Haemophilia A	2,190	1,380	+68	4.9	2.8
Ophthalmology	1,444	1,826	–16	3.2	3.8
Infectious diseases	861	1,089	–15	1.9	2.2
Other therapeutic areas	3,549	3,778	–1	8.0	7.9
Total sales	**44,532**	**48,516**	**–2**	**100**	**100**

Biosimilar competition and the COVID-19 pandemic had an overall negative impact on the division's sales in 2020. There was a general dampening on sales from the COVID-19-related restrictions beginning with the second quarter. Hospitalisations and outpatient visits decreased, which particularly impacted sales of Ocrevus, Hemlibra, Lucentis and MabThera/Rituxan. New product sales continued to partly compensate for the increasing competition from biosimilars, notably MabThera/Rituxan, Herceptin and Avastin in the US, and the COVID-19 impacts. Actemra/RoActemra sales increased by 32% driven by the adoption in treatment guidelines for patients with severe COVID-19 pneumonia.

The sales growth of new products was driven by the continuing rollout of Tecentriq, Hemlibra, Ocrevus, Perjeta and Kadcyla, which together contributed an additional CHF 3.9 billion (CER) of new sales. Tecentriq sales grew by 55% to CHF 2.7 billion, mostly due to higher demand in the US and major EU markets. The launch and rollout of Hemlibra continued across the US, Japan and major EU markets with sales reaching CHF 2.2 billion, an increase of 68%, while Ocrevus continued its growth development, with a 24% sales increase to CHF 4.3 billion. The sales and uptake of both Ocrevus and Hemlibra were especially adversely affected by the COVID-19 pandemic. Perjeta sales were up by 18%, with China being a major driver of growth. Kadcyla sales grew by 34% mainly due to higher demand in the US and Europe with further patients switched to the new standard of care following the positive readout of the KATHERINE study in October 2018.

Biosimilar competition had a negative impact, with continuing erosion for Herceptin, MabThera/Rituxan and Avastin, mostly in the US. Global sales of these three products fell by CHF 5.8 billion (CER) to total sales of CHF 12.9 billion, a decrease of 30% in 2020. The COVID-19 pandemic also had an impact on sales of these three products, notably in China and for MabThera/Rituxan in the US. Sales in China were also affected following price updates since the inclusion in the National Reimbursement Drug List (NRDL). The first biosimilar versions of Herceptin, Avastin and MabThera/Rituxan entered the market in the US in the second half of 2019 and combined US sales on these three products were CHF 3.8 billion (CER) lower in 2020. Sales of Herceptin and MabThera/Rituxan in Europe declined by CHF 0.5 billion (CER). Sales of Avastin in Europe declined by CHF 0.4 billion (CER) in the second half of 2020 since the first biosimilar version of Avastin entered the market.

Sales in the oncology therapeutic area decreased by 10%, due to the biosimilar competition for Herceptin, Avastin and MabThera/Rituxan described above, partially compensated by growth of Tecentriq and Perjeta. Tecentriq sales grew in all regions, mostly due to higher demand in the US and major EU markets and the rollout in Japan. Perjeta sales increased mostly due to growth in China. Kadcyla and Alecensa both showed continuing post-launch growth across all regions.

Sales in immunology grew by 3%, with Actemra/RoActemra and Xolair increasing by 32% and 2%, respectively. The increase in Actemra/RoActemra sales was mainly driven by the adoption of this medicine by many countries in their guidelines to treat patients with severe COVID-19 pneumonia. MabThera/Rituxan sales in immunology decreased by 32% driven by the US, due to the impacts of the COVID-19 pandemic and biosimilar entry. Lucentis sales declined by 16% in the US and were affected by COVID-19 restrictions disrupting ophthalmology practices and limiting patient access. Infectious diseases sales were 15% lower due to lower sales of Tamiflu and Rocephin.

Product sales

Pharmaceuticals Division – Sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Oncology					
Avastin	4,992	7,073	–25	11.2	14.6
Perjeta	3,883	3,522	+18	8.7	7.3
Herceptin	3,732	6,039	–34	8.4	12.4
MabThera/Rituxan[a)]	3,206	4,890	–30	7.2	10.1
Tecentriq	2,738	1,875	+55	6.1	3.9
Kadcyla	1,745	1,393	+34	3.9	2.9
Alecensa	1,160	876	+40	2.6	1.8
Gazyva/Gazyvaro	632	552	+21	1.4	1.1
Xeloda	301	406	–21	0.7	0.8
Polivy	169	51	+248	0.4	0.1
Tarceva	160	298	–43	0.4	0.6
Others	605	596	+8	1.4	1.2
Total Oncology	**23,323**	**27,571**	**–10**	**52.4**	**56.8**
Immunology					
Actemra/RoActemra	2,858	2,311	+32	6.4	4.8
Xolair	1,904	1,969	+2	4.3	4.1
Esbriet	1,108	1,129	+4	2.5	2.3
MabThera/Rituxan[a)]	1,017	1,587	–32	2.3	3.3
Pulmozyme	642	751	–9	1.4	1.5
CellCept	606	656	–2	1.4	1.4
Others	93	111	–13	0.2	0.1
Total Immunology	**8,228**	**8,514**	**+3**	**18.5**	**17.5**
Neuroscience					
Ocrevus	4,326	3,708	+24	9.7	7.6
Madopar	361	367	+8	0.8	0.8
Others	250	283	–2	0.6	0.6
Total Neuroscience	**4,937**	**4,358**	**+21**	**11.1**	**9.0**
Haemophilia A					
Hemlibra	2,190	1,380	+68	4.9	2.8
Total Haemophilia A	**2,190**	**1,380**	**+68**	**4.9**	**2.8**
Ophthalmology					
Lucentis	1,444	1,826	–16	3.2	3.8
Total Ophthalmology	**1,444**	**1,826**	**–16**	**3.2**	**3.8**
Infectious diseases					
Tamiflu	272	377	–22	0.6	0.8
Rocephin	252	342	–21	0.6	0.7
Others	337	370	–3	0.7	0.7
Total Infectious diseases	**861**	**1,089**	**–15**	**1.9**	**2.2**
Other therapeutic areas					
Activase/TNKase	1,321	1,332	+5	3.0	2.7
Mircera	470	591	–17	1.1	1.2
NeoRecormon/Epogin	239	262	–4	0.5	0.5
Others	1,519	1,593	0	3.4	3.5
Total other therapeutic areas	**3,549**	**3,778**	**–1**	**8.0**	**7.9**
Total sales	**44,532**	**48,516**	**–2**	**100**	**100**

a) Total MabThera/Rituxan sales of CHF 4,223 million (2019: CHF 6,477 million) split between oncology and immunology therapeutic areas.

Avastin. For advanced colorectal, breast, lung, kidney, cervical and ovarian cancer, relapsed glioblastoma and liver cancer in combination with Tecentriq.

Avastin regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,795	3,019	–37	36.0	42.7
Europe	1,252	1,794	–27	25.1	25.4
Japan	717	871	–15	14.4	12.3
International	1,228	1,389	–2	24.5	19.6
Total sales	**4,992**	**7,073**	**–25**	**100**	**100**

US sales decreased by 37% due to the launch of biosimilars. In Europe the sales decrease was due to biosimilar competition in the second half of the year and competitive pressure, notably in Germany, France and Italy. In Japan sales decreased due to the government price cut and biosimilar competition. In the International region, the main driver in the sales decline was Canada.

Ocrevus. For relapsing forms of multiple sclerosis (RMS) and primary progressive multiple sclerosis (PPMS).

Ocrevus regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	3,408	3,049	+18	78.8	82.2
Europe	674	495	+41	15.6	13.3
International	244	164	+68	5.6	4.5
Total sales	**4,326**	**3,708**	**+24**	**100**	**100**

There was continuously growing demand in both indications in the US, with growth driven both by new and returning patients, with a higher proportion of sales coming from returning patients. In Europe and the International region Ocrevus continues to show strong uptake where launched, notably in France, Germany, Canada and Spain. Sales of Ocrevus were impacted by COVID-19 as the treatment is administered by intravenous infusion and requires hospital visits, which in many cases were cancelled or delayed during the pandemic restrictions.

MabThera/Rituxan. For non-Hodgkin lymphoma (NHL), chronic lymphocytic leukaemia (CLL), follicular lymphoma (FL) and pemphigus vulgaris (PV), rheumatoid arthritis (RA) as well as certain types of antineutrophil cytoplasmic antibody (ANCA)-associated vasculitis.

MabThera/Rituxan regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	2,864	4,488	–32	67.8	69.3
Europe	379	590	–33	9.0	9.1
Japan	64	109	–39	1.5	1.7
International	916	1,290	–22	21.7	19.9
Total sales	**4,223**	**6,477**	**–31**	**100**	**100**

Sales were 31% lower due to biosimilar erosion as well as market contraction from the COVID-19 pandemic restrictions. US sales decreased by 32%, with a decline in both the oncology and immunology segments, and in part driven by COVID-19. Sales in the International region were lower with a 23% decline in China following price updates since the inclusion in the National Reimbursement Drug List (NRDL) and a 47% decline in Brazil. In Japan sales decreased due to biosimilar competition.

HER2 franchise (Herceptin, Perjeta, Kadcyla and Phesgo). For HER2-positive breast cancer and HER2-positive metastatic (advanced) gastric cancer (Herceptin only).

Herceptin regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,356	2,707	–47	36.3	44.8
Europe	665	1,013	–32	17.8	16.8
Japan	140	243	–40	3.8	4.0
International	1,571	2,076	–17	42.1	34.4
Total sales	**3,732**	**6,039**	**–34**	**100**	**100**

Perjeta regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,476	1,528	+2	38.0	43.4
Europe	1,150	1,092	+10	29.6	31.0
Japan	294	280	+9	7.6	8.0
International	963	622	+75	24.8	17.6
Total sales	**3,883**	**3,522**	**+18**	**100**	**100**

Kadcyla regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	807	635	+34	46.2	45.6
Europe	560	432	+35	32.1	31.0
Japan	90	82	+13	5.2	5.9
International	288	244	+37	16.5	17.5
Total sales	**1,745**	**1,393**	**+34**	**100**	**100**

Phesgo regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	23	0	–	100	0
Total sales	**23**	**0**	**–**	**100**	**0**

Sales in the HER2 franchise decreased by 8% to CHF 9.4 billion. Herceptin sales were 34% lower, driven by biosimilar launches which started in the second half of 2019 in the US and in mid-2018 in Japan and Europe. Sales of Perjeta grew by 18% with increases mostly driven by China in both the early breast cancer and metastatic breast cancer settings. In the US, sales of Perjeta grew by 2% due to growth in the early breast cancer setting, partly offset by COVID-19 restrictions. Kadcyla sales increased by 34%, notably in the early breast cancer setting. Kadcyla sales benefited from the positive readout from the KATHERINE study and by patients switching to the new standard of care.

Actemra/RoActemra. For rheumatoid arthritis (RA), systemic juvenile idiopathic arthritis, polyarticular juvenile idiopathic arthritis and giant cell arteritis.

Actemra/RoActemra regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,212	944	+36	42.4	40.8
Europe	783	705	+16	27.4	30.5
Japan	366	398	–5	12.8	17.2
International	497	264	+116	17.4	11.5
Total sales	**2,858**	**2,311**	**+32**	**100**	**100**

Sales increased by 32%, with growth driven by the adoption of Actemra/RoActemra by many countries in their treatment guidelines to treat patients with severe COVID-19 pneumonia. The US was the major contributor to the sales increase, along with Russia, India and Spain. Various clinical studies (COVACTA and EMPACTA) to evaluate the safety and efficacy of Actemra/RoActemra in patients with severe COVID-19 pneumonia have been carried out and the results made available to healthcare authorities.

Tecentriq. For advanced bladder cancer, advanced lung cancer, initial therapy of non-squamous non-small cell lung cancer (NSCLC), extensive-stage small cell lung cancer, PD-L1-positive triple-negative breast cancer and unresectable or metastatic hepatocellular carcinoma.

Tecentriq regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,566	1,180	+40	57.2	62.9
Europe	576	349	+72	21.0	18.6
Japan	330	188	+82	12.1	10.0
International	266	158	+93	9.7	8.5
Total sales	**2,738**	**1,875**	**+55**	**100**	**100**

Sales grew by 55% with growth in all regions, notably in the US where higher sales were driven by the new indications for extensive-stage small cell lung cancer, PD-L1-positive triple-negative breast cancer and unresectable or metastatic hepatocellular carcinoma. In Europe, sales grew mainly driven by Germany.

Hemlibra. For haemophilia A.

Hemlibra regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,388	943	+56	63.4	68.3
Europe	373	165	+135	17.0	12.0
Japan	313	232	+40	14.3	16.8
International	116	40	+233	5.3	2.9
Total sales	**2,190**	**1,380**	**+68**	**100**	**100**

The global rollout of Hemlibra continued throughout 2020. Sales continued to show a strong uptake, especially in the US and Europe, with strong demand in the non-inhibitor segment. COVID-19 restrictions caused a slowdown in growth due to missed patient visits affecting potential new patients, whereas existing patients remained on their treatment.

Xolair. For moderate to severe persistent allergic asthma (AA) and chronic idiopathic urticaria (CIU).

Xolair regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,904	1,969	+2	100	100
Total sales	**1,904**	**1,969**	**+2**	**100**	**100**

Sales increased by 2%, driven by both indications. Xolair remains the market leader in the larger allergic asthma indication.

Lucentis. For wet age-related macular degeneration (wAMD), macular oedema following retinal vein occlusion (RVO), diabetic macular oedema (DME) and diabetic retinopathy (DR).

Lucentis regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,444	1,826	−16	100	100
Total sales	**1,444**	**1,826**	**−16**	**100**	**100**

US sales decreased by 16% in all approved indications. The COVID-19 pandemic caused some disruption in hospitals and ophthalmology practices, and many patients delayed treatment during the restrictions.

Activase/TNKase. For acute ischaemic stroke (AIS) and acute myocardial infarction (AMI).

Activase/TNKase regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	1,268	1,278	+5	96.0	95.9
International	53	54	+6	4.0	4.1
Total sales	**1,321**	**1,332**	**+5**	**100**	**100**

Sales were 5% higher, with increased demand for TNKase during the COVID-19 pandemic due to the injection administration method being easier to use.

Alecensa. For ALK-positive non-small cell lung cancer (NSCLC).

Alecensa regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	343	329	+10	29.6	37.6
Europe	264	212	+29	22.8	24.2
Japan	240	217	+15	20.7	24.8
International	313	118	+189	26.9	13.4
Total sales	**1,160**	**876**	**+40**	**100**	**100**

The global uptake continued with a 40% increase in sales across all regions. In International the main growth driver was China where sales benefitted from the NRDL listing.

Esbriet. For idiopathic pulmonary fibrosis (IPF).

Esbriet regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	788	806	+3	71.1	71.4
Europe	266	263	+6	24.0	23.3
International	54	60	+5	4.9	5.3
Total sales	**1,108**	**1,129**	**+4**	**100**	**100**

Sales grew by 4% driven by increased use in the US in indications other than IPF.

Pharmaceuticals Division – Sales by region

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
United States	23,647	26,711	–6	53.1	55.1
Europe	8,198	8,453	+1	18.4	17.4
Japan	3,765	4,143	–6	8.5	8.5
International	8,922	9,209	+7	20.0	19.0
Total sales	**44,532**	**48,516**	**–2**	**100**	**100**

United States. Sales decreased by 6% driven by the combined 38% fall in Herceptin, Avastin and MabThera/Rituxan sales due to the launches of biosimilars as well as market contractions due to COVID-19 particularly for MabThera/Rituxan. Hemlibra continued to show strong uptake since being launched in November 2017. Actemra/RoActemra sales increased by 36% mostly due to the use for hospitalised patients with severe COVID-19 pneumonia. Tecentriq sales increased by 40% due to growth in the new indications. Ocrevus sales increased by 18% and were driven by both new and returning patient demand, partly dampened by COVID-19 effects. Sales in the HER2 franchise decreased by 20%, driven by lower Herceptin sales, partially offset by a 34% sales increase for Kadcyla, notably in the early breast cancer setting. Lucentis sales decreased due to COVID-19 impacts.

Europe. Sales grew by 1% with new product sales more than compensating for the biosimilar competition to Herceptin (–32%), MabThera/Rituxan (–33%) and Avastin (–27%) and impacts of the COVID-19 pandemic. Tecentriq sales continued to grow and increased by 72% following successful launches, notably in Germany, and continued uptake across Europe. Hemlibra (+135%) and Ocrevus (+41%) showed strong uptake, in particular in France and Germany.

Japan. Sales decreased by 6%, driven by lower sales of Avastin (–15%), Herceptin (–40%) and MabThera/Rituxan (–39%) which were negatively affected by biosimilar competition and government price cuts. This decline was partially compensated for by recently launched products including Tecentriq and Hemlibra. Perjeta grew by 9% due to the launch of an additional indication for early breast cancer.

International. Sales increased by 7%, mostly driven by China and Russia. There was a strong uptake in China of Perjeta and Alecensa, partially offset by the NRDL price update and the COVID-19 impacts. Most of the 8% sales increase in China was due to the base effect of the reduction in the level of channel inventory in 2019. Sales in the rest of the International region increased by 7% with growth in new products (Perjeta, Ocrevus, Tecentriq, Hemlibra, Kadcyla and Alecensa) and Actemra/RoActemra more than offsetting a decline in Herceptin and MabThera/Rituxan. Sales in Russia grew due to the inclusion of Tecentriq, Kadcyla, Perjeta and Herceptin in the National Oncology Program, the adoption of Actemra/RoActemra in the country's COVID-19 treatment guidelines as well as the launches of Hemlibra and Ocrevus.

Pharmaceuticals Division – Sales for E7 leading emerging markets

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Brazil	620	889	–4	1.4	1.8
China	3,143	3,062	+8	7.2	6.4
India	105	64	+82	0.2	0.1
Mexico	238	259	+8	0.5	0.5
Russia	378	244	+79	0.8	0.5
South Korea	357	373	+2	0.8	0.8
Turkey	230	250	+19	0.5	0.5
Total sales	**5,071**	**5,141**	**+11**	**11.4**	**10.6**

Competition from generic medicines and biosimilars

The Group's pharmaceutical products are generally protected by patent rights, which are intended to provide the Group with exclusive marketing rights in various countries. However, patent rights are of varying scope and duration, and the Group may be required to enter into costly litigation to enforce its patent and other intellectual property rights. Loss of market exclusivity for one or more major products – either due to patent expiration, challenges from generic medicines, biosimilars and non-comparable biologics or other reasons – could have a material adverse effect on the Group's business, results of operations or financial condition. The introduction of a generic, biosimilar or non-comparable biologic version of the same or a similar medicine typically results in a significant reduction in net sales for the relevant product, as other manufacturers typically offer their versions at lower prices.

Patents and their expiry are, and always have been, an integral part of the Group's business model and future growth will remain driven by innovation. The latest information from clinical studies is included in the Annual Report and details of the Group's Product Development Portfolio are available for download at:
http://www.roche.com/research_and_development/who_we_are_how_we_work/pipeline.htm

The intellectual property for biologics can involve multiple patents and patent timelines for each individual product and therefore it is more difficult to give an exact date for patent expiry for biologic medicines. The Group's basic, primary patents for MabThera/Rituxan, Herceptin and Avastin have expired in the US and the EU. The secondary patent rights for subcutaneous formulations of MabThera/Rituxan and Herceptin expire beyond 2025. In addition there are recent and approaching patent expiries in the US for Lucentis which may have an impact on 2021 sales for this product.

Biosimilar competition for MabThera/Rituxan, Herceptin and Avastin in the US, Europe and Japan had an estimated negative impact of CHF 5.1 billion (CER) in 2020, with the main impact being sales in the US which fell by CHF 3.8 billion (CER).
The COVID-19 pandemic had a negative impact on the overall market in 2020, notably for MabThera/Rituxan in the US.

United States. The first biosimilar versions of Herceptin and Avastin were launched in the US from mid-2019 and the first biosimilar versions of MabThera/Rituxan in late 2019. Sales in 2020 for these three products were CHF 3.8 billion lower (CER) than in the prior period, a decline of 38%. US sales of these three products were also affected by the COVID-19 pandemic which had a certain impact on the overall market, particularly for MabThera/Rituxan.

Europe. The first biosimilar versions of MabThera/Rituxan and Herceptin were launched in Europe from mid-2017 and from mid-2018, respectively. They are now marketed in most EU countries and were the major factor in the continuing sales decline of CHF 0.5 billion (CER) for these two products in Europe in 2020. The first biosimilar versions of Avastin came to market in Europe from mid-2020 and were a significant factor in the decline in sales of CHF 0.4 billion (CER) for Avastin in Europe in the second half of 2020.

Japan. In Japan, the first biosimilar versions of MabThera/Rituxan and Herceptin were launched in 2018. Sales were impacted by this and by government price cuts. Biosimilar versions of Avastin were launched in late 2019 in the colorectal cancer indication and in 2020 in the non-small cell lung cancer indication. Sales of these three products combined in 2020 were 22% lower and were impacted by competition and by government price cuts.

2020 product sales affected by biosimilar launches

	2020 (CHF m)	2019 (CHF m)	% change (CER)	Comment
MabThera/Rituxan – US	2,864	4,488	–32	First biosimilar launches from late 2019
Herceptin – US	1,356	2,707	–47	First biosimilar launches from mid-2019
Avastin – US	1,795	3,019	–37	First biosimilar launches from mid-2019
MabThera/Rituxan – Europe	379	590	–33	First biosimilar launches from mid-2017
Herceptin – Europe	665	1,013	–32	First biosimilar launches from mid-2018
Avastin – Europe	1,252	1,794	–27	First biosimilar launches from mid-2020
MabThera/Rituxan – Japan	64	109	–39	First biosimilar launches from early 2018
Herceptin – Japan	140	243	–40	First biosimilar launches from mid-2018
Avastin – Japan	717	871	–15	First biosimilar launches from late 2019[a)]

a) Colorectal and non-small cell lung cancer indications.

Sales in 2020 and 2019 for MabThera/Rituxan, Herceptin and Avastin are disclosed above in the previous sections, including regional breakdowns. These are summarised in the table below. As noted in the previous sections, the year-on-year movements are also driven by regular price and volume changes, as well as by the impacts of the COVID-19 pandemic. Biosimilar competition is only one factor in the overall picture.

Total MabThera/Rituxan, Herceptin and Avastin sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% division sales (2020)	% division sales (2019)
United States	6,015	10,214	–38	13.5	21.1
Europe	2,296	3,397	–30	5.2	7.0
Japan	921	1,223	–22	2.1	2.5
International	3,715	4,755	–14	8.3	9.8
Total sales	**12,947**	**19,589**	**–30**	**29.1**	**40.4**

Operating results

Pharmaceuticals Division – Royalties and other operating income

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Royalty income	1,012	1,039	+2
Income from out-licensing agreements	163	198	–14
Income from disposal of products and other	784	961	–15
Total – IFRS and Core basis	**1,959**	**2,198**	**–7**

Royalties and other operating income decreased by 7% at CER. Royalty income increased by 2%, as a settlement gain of CHF 128 million more than compensated for the lower income from the expired Cabilly patent. Royalty income from Venclexta/Venclyxto sales outside the US increased, while royalty income from Lucentis sales outside the US was lower. The decrease of out-licensing income was due to lower milestone income. Income from product disposals and other decreased due to an income in 2019 of CHF 446 million from sale of rights for Lexotan, Bactrim and Dormicum. This was partially compensated by an income in 2020 of CHF 202 million from the sale of the global rights for Rocaltrol, excluding China and Japan, and Valium, as well as higher profit-share income due to increased sales of Venclexta/Venclyxto in the US.

Pharmaceuticals Division – Cost of sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Manufacturing cost of goods sold and period costs	(5,021)	(6,086)	–13
Royalty expenses	(1,177)	(1,456)	–14
Collaboration and profit-sharing agreements	(1,864)	(2,397)	–18
Impairment of property, plant and equipment	(8)	(241)	–96
Cost of sales – Core basis	**(8,070)**	**(10,180)**	**–16**
Global restructuring plans	(122)	(260)	–51
Amortisation of intangible assets	(1,210)	(1,153)	+10
Impairment of intangible assets	(81)	0	–
Total – IFRS basis	**(9,483)**	**(11,593)**	**–14**

Core costs decreased by 16% at CER. As a percentage of sales, cost of sales decreased by 2.7 percentage points to 18.2%. Manufacturing cost of sales decreased by 13%, while sales declined by 2%. This was due to inventory write-offs in 2019, product mix factors and productivity improvements. Royalty expenses were 14% lower with a decrease in royalty expenses related to the expired Cabilly patent, partially offset by increased sales for certain royalty-bearing products, notably Ocrevus. Collaboration and profit-sharing expenses decreased by 18% driven by lower US sales of MabThera/Rituxan. In 2019 an impairment of property, plant and equipment for idle plant was recognised. Restructuring costs mainly related to resourcing flexibility initiatives. Amortisation charges went up by 10% due to the Rozlytrek product intangible assets, which started being amortised after the product launch in the second half of 2019, and the Luxturna product intangible assets from the Spark Therapeutics acquisition. Impairment charges in 2020 relate to Luxturna due to reduced sales expectations.

Pharmaceuticals Division – Marketing and distribution

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Marketing and distribution – Core basis	**(6,633)**	**(7,604)**	**–8**
Global restructuring plans	(139)	(267)	–45
Amortisation of intangible assets	(24)	(33)	–24
Impairment of intangible assets	0	(1)	–100
Total – IFRS basis	**(6,796)**	**(7,905)**	**–10**

Core costs decreased by 8% at CER. As a percentage of sales, they decreased to 14.9% from 15.7% in the comparative period. Major marketing and distribution activities included supporting the rollouts of Tecentriq, Ocrevus and Perjeta and supporting the launch activities in 2020. The cost decrease was mainly due to a general slowdown in marketing activities in 2020, including lower expenses for congresses due to COVID-19 restrictions. The cost decrease was also associated with lower personnel expenses in 2020, including lower headcount costs in the field force. Restructuring costs were related to transformation initiatives.

Pharmaceuticals Division – Research and development

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Research and development – Core basis	**(10,597)**	**(10,228)**	**+8**
Global restructuring plans	(75)	(141)	–45
Amortisation of intangible assets	(405)	(220)	+92
Impairment of intangible assets	(344)	(632)	–43
Total – IFRS basis	**(11,421)**	**(11,221)**	**+6**

Core costs increased by 8% at CER and, as a percentage of sales, increased by 2.7 percentage points to 23.8%. The oncology franchise remained the primary area of research and development with the cancer immunotherapy portfolio being a key driver. Neuroscience and immunology also represent significant areas of spending. Growth in spend is mostly driven by late-stage investments in ophthalmology, personalised healthcare and neuroscience, as well as spending at Spark Therapeutics and Flatiron Health. Amortisation charges were higher notably due to the exercise of a priority review voucher. Impairment charges in 2020 were mainly a result of a delay in clinical trials for the Spark Therapeutics' haemophilia A intangible asset.

In addition, the Pharmaceuticals Division acquired various product intangibles under development and technologies through in-licensing transactions and asset acquisitions, which in total added CHF 3.9 billion to intangible assets. The major items were payments of CHF 0.8 billion to Sarepta for the exclusive right to launch and commercialise SRP-9001, Sarepta's investigational micro-dystrophin gene therapy for Duchenne muscular dystrophy (DMD) outside the US and CHF 0.7 billion to Blueprint Medicines, where, as part of a licensing and collaboration agreement, the Group obtained co-development and co-commercialisation rights for pralsetinib (Gavreto), Blueprint Medicines' investigational, precision therapy in late-stage development for people with RET-altered non-small cell lung cancer (NSCLC), various types of thyroid cancer and other solid tumours. Other investments include payments of CHF 0.3 billion to Atea, CHF 0.4 billion for the Inflazome asset acquisition and CHF 0.4 billion for the Promedior asset acquisition. See the above sections on 'Mergers and acquisitions' and 'Alliance transactions' for further details.

Pharmaceuticals Division – General and administration

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Administration	(1,513)	(1,496)	+6
Pensions – past service costs	(1)	(10)	–91
Gains (losses) on disposal of property, plant and equipment and right-of-use assets	(6)	(9)	–26
Business taxes and capital taxes	(231)	(195)	+24
Other general items	37	23	+127
General and administration – Core basis	**(1,714)**	**(1,687)**	**+6**
Global restructuring plans	(237)	(68)	+261
Mergers and acquisitions and alliance transactions	(34)	(80)	–55
Legal and environmental cases	344	(215)	–
Pensions plan settlements	2	1	–
Total – IFRS basis	**(1,639)**	**(2,049)**	**–17**

Core costs increased by 6% at CER and, as a percentage of sales, increased to 3.8% from 3.5% in 2019. Administration costs were higher mainly due to the recently acquired Spark Therapeutics and also Flatiron Health and Foundation Medicine. Business taxes and capital taxes increased by 24% primarily due to the relatively lower costs for the US Branded Prescription Drug Fee in 2019. Other general items increased due to lower personnel costs. Restructuring costs were related to business transformation initiatives. The income from legal and environmental cases was related to the release of the Accutane US litigation provision.

Roche Pharmaceuticals and Chugai subdivisional operating results

Pharmaceuticals subdivisional operating results in millions of CHF

	Roche Pharmaceuticals 2020	Roche Pharmaceuticals 2019	Chugai 2020	Chugai 2019	Pharmaceuticals Division 2020	Pharmaceuticals Division 2019
Sales						
– External customers	40,767	44,373	3,765	4,143	44,532	48,516
– Within division	1,660	1,646	1,804	1,224	3,464	2,870
Core operating profit	17,029	19,217	2,715	2,056	19,477	21,015
– margin, % of sales to external customers	41.8	43.3	72.1	49.6	43.7	43.3
Operating profit	14,765	16,264	2,654	1,940	17,152	17,946
– margin, % of sales to external customers	36.2	36.7	70.5	46.8	38.5	37.0
Operating free cash flow	12,066	18,882	1,783	1,654	13,853	20,536
– margin, % of sales to external customers	29.6	42.6	47.4	39.9	31.1	42.3

Pharmaceuticals Division total core operating profit and operating profit both include the elimination of CHF minus 267 million of unrealised intercompany gains between Roche Pharmaceuticals and Chugai (2019: CHF minus 258 million).

At CER (as reported in Japanese yen), sales by Chugai to external customers decreased by 6% while sales within the division increased by 53%. Chugai core operating profit increased by 35% due to higher royalty income from Roche Pharmaceuticals as well as higher gross profit from sales within the division. This was partially offset by higher research and development costs. Operating free cash flow at Chugai increased by 10% at CER mainly as a result of the strong operating performance partially offset by an increase in net working capital. The appreciation of the Swiss franc against the Japanese yen had an adverse impact of approximately 3 percentage points on the Chugai core operating profit in the Group's consolidated results expressed in Swiss francs.

Financial position

Pharmaceuticals Division – Net operating assets

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)	Movement: Transactions (CHF m)	Movement: CTA and other (CHF m)
Trade receivables	6,992	7,418	–6	+2	110	(536)
Inventories	4,208	3,696	+14	+19	702	(190)
Trade payables	(1,958)	(2,007)	–2	+3	(52)	101
Net trade working capital	**9,242**	**9,107**	**+1**	**+8**	**760**	**(625)**
Other receivables (payables)	(6,788)	(7,666)	–11	–7	496	382
Net working capital	**2,454**	**1,441**	**+70**	**+87**	**1,256**	**(243)**
Property, plant and equipment	15,270	15,306	0	+4	639	(675)
Right-of-use assets	801	801	0	+7	51	(51)
Goodwill and intangible assets[a)]	16,539	16,016	+3	+11	1,834	(1,311)
Provisions	(2,108)	(3,140)	–33	–30	907	125
Other long-term assets, net	515	365	+41	+50	180	(30)
Long-term net operating assets[a)]	**31,017**	**29,348**	**+6**	**+12**	**3,611**	**(1,942)**
Net operating assets[a)]	**33,471**	**30,789**	**+9**	**+16**	**4,867**	**(2,185)**

a) Provisional 2019 balance sheet amounts restated for final accounting of Spark Therapeutics acquisition (see Note 6 to the Annual Financial Statements).

The absolute amount of the movement between the 2020 and 2019 consolidated balances reported in Swiss francs is split between actual 2020 transactions (translated at average rates for 2019) and the currency translation adjustment (CTA) that arises on consolidation. The 2020 transactions include non-cash movements and therefore the movements in this table are not the same as the amounts shown in the operating free cash flow (which only includes the cash movements). A full consolidated balance sheet is given on page 51 of the Annual Financial Statements, and a reconciliation between that balance sheet and the information given above is on page 175.

Currency translation effects on balance sheet amounts. Compared to the start of the year the Swiss franc appreciated against almost all currencies, with the US dollar having a strong effect and, additionally, the Japanese yen and Brazilian real having a significant effect on the net operating assets of the Pharmaceuticals Division. This resulted in a net negative translation impact. The exchange rates used are given on page 36.

Net working capital. Net working capital increased by 87%, while net trade working capital was 8% higher. Inventory was higher by 19% and driven by active management to ensure product availability and by launch supply. Trade receivables increased by 2% compared to the start of the year, with the 21% increase due to temporarily extended payment terms in the US noted in the interim results at 30 June 2020 being settled in the second half of 2020. The net liability position for other receivables/payables decreased following the settlement of the accruals recorded at the end of 2019.

Long-term net operating assets. Overall long-term net operating assets increased by 12%, due to increased intangible assets and lower provisions. Intangible asset additions from in-licensing transactions and asset acquisitions in the Pharmaceuticals Division were CHF 3.9 billion, and include the CHF 0.8 billion paid to Sarepta for the exclusive rights to launch and commercialise Sarepta's investigational micro-dystrophin gene therapy for Duchenne muscular dystrophy (DMD) outside the US. Furthermore Roche paid CHF 0.7 billion to Blueprint Medicines for the co-development and co-commercialisation rights for pralsetinib (Gavreto), an investigational, precision therapy in late-stage development for people with RET-altered non-small cell lung cancer (NSCLC), various types of thyroid cancer and other solid tumours. Additional intangible assets purchases were for the asset acquisitions of Inflazome and Promedior and upfront payments to Atea, Arrakis Therapeutics, Vaccibody, Vividion Therapeutics and UCB (see the above section on 'Alliance transactions'). Capital expenditure includes manufacturing investments in the US, Japan, Switzerland and Germany, site developments in Switzerland and the US, and Chugai's research facilities at Yokohama in Japan. In total the additional capital expenditure for COVID-19-related projects in the Pharmaceuticals Division was CHF 90 million. Provisions decreased due to the release of the Accutane US litigation provision and the cash settlement for past royalties related to the PDL-1 inhibitor litigation.

Free cash flow

Pharmaceuticals Division – Operating free cash flow

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
Operating profit	**17,152**	**17,946**	**–4**	**+4**
– Depreciation, amortisation and impairment	3,535	3,729	–5	–1
– Provisions	(867)	779	–	–
– Equity compensation plans	559	464	+20	+27
– Other	86	495	–83	–83
Operating profit cash adjustments	**3,313**	**5,467**	**–39**	**–37**
Operating profit, net of operating cash adjustments	**20,465**	**23,413**	**–13**	**–6**
(Increase) decrease in net working capital	(1,296)	385	–	–
Investments in property, plant and equipment	(1,981)	(1,889)	+5	+8
Principal portion of lease liabilities paid	(250)	(248)	+1	+5
Investments in intangible assets	(3,085)	(1,125)	+174	+180
Operating free cash flow	**13,853**	**20,536**	**–33**	**–26**
– as % of sales	31.1	42.3	–11.2	–10.2

See pages 171–173 for the definition of free cash flow and a detailed breakdown.

The Pharmaceuticals Division's operating free cash flow decreased by 26% at CER to CHF 13.9 billion. The cash generation of the business, measured by the operating profit, net of operating cash adjustments, was down 6%. The lower sales and the increased research and development spending had a negative impact on the operating free cash flow, partly offset by lower spending on marketing and distribution. Net working capital absorbed an additional CHF 1.3 billion of cash, largely driven by higher inventory and the settlement of payables, for the reasons described above in the 'Financial position' section. Capital expenditure was higher than in the prior year, in part due to the response to the COVID-19 pandemic. Investments in intangible assets were significantly higher than in 2019 and include payments to Sarepta of CHF 0.8 billion, to Blueprint Medicines of CHF 0.7 billion and the new in-licensing and alliance transactions with Atea, Arrakis Therapeutics, Vaccibody, Vividion Therapeutics and UCB as well as the payment for the 2019 Dicerna Pharmaceuticals transaction (see the above section on 'Alliance transactions'). The appreciation of the Swiss franc had a significant negative impact on the free cash flows measures expressed in CHF terms.

Diagnostics Division operating results

Diagnostics Division operating results

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
IFRS results				
Sales	13,791	12,950	+6	+14
Royalties and other operating income	61	87	–30	–26
Revenue	**13,852**	**13,037**	**+6**	**+14**
Cost of sales	(6,694)	(6,758)	–1	+4
Marketing and distribution	(2,776)	(3,055)	–9	–3
Research and development	(1,588)	(1,553)	+2	+6
General and administration	(793)	(1,429)	–45	–42
Operating profit	**2,001**	**242**	**Over +500**	**Over +500**
– margin, % of sales	14.5	1.9	+12.6	+14.2
Core results[a)]				
Sales	13,791	12,950	+6	+14
Royalties and other operating income	61	87	–30	–26
Revenue	**13,852**	**13,037**	**+6**	**+14**
Cost of sales	(6,497)	(6,183)	+5	+10
Marketing and distribution	(2,728)	(2,909)	–6	0
Research and development	(1,556)	(1,468)	+6	+10
General and administration	(507)	(511)	–1	+3
Core operating profit	**2,564**	**1,966**	**+30**	**+50**
– margin, % of sales	18.6	15.2	+3.4	+4.8
Financial position				
Net working capital	2,977	2,742	+9	+15
Long-term net operating assets	10,787	11,036	–2	+3
Net operating assets	**13,764**	**13,778**	**0**	**+6**
Free cash flow[b)]				
Operating free cash flow	1,571	963	+63	+96
– margin, % of sales	11.4	7.4	+4.0	+5.4

a) See pages 168–171 for the definition of core results.
b) See pages 171–173 for the definition of free cash flow.

Sales overview

Diagnostics Division – Sales by business area

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Centralised and Point of Care Solutions	7,273	7,819	–1	52.7	60.4
Molecular Diagnostics	3,760	2,109	+90	27.3	16.3
Diabetes Care	1,670	1,918	–5	12.1	14.8
Tissue Diagnostics	1,088	1,104	+5	7.9	8.5
Total sales	**13,791**	**12,950**	**+14**	**100**	**100**

The Diagnostics Division reported overall sales growth of 14% at CER to CHF 13.8 billion. The COVID-19 pandemic had contrasting impacts in the different parts of the business. Molecular Diagnostics reported a sales growth of 90% due to the launch of the cobas SARS-CoV-2 PCR test, while Centralised and Point of Care Solutions sales decreased by 1% due to the reduction in routine testing volume, partially offset by the launch of COVID-19 testing products in the second half of 2020. Diabetes Care sales declined by 5% due to the continued overall contraction of the blood glucose monitoring market and the impact of the COVID-19 pandemic.

The sales of the various COVID-19-related tests was CHF 2.6 billion (CER), offsetting the decline in routine testing, and driving the Diagnostics Division annual growth of 14%. Sales of COVID-19-related tests in Molecular Diagnostics were CHF 2.1 billion (CER), consisting mainly of the cobas SARS-CoV-2 PCR tests launched in March 2020, while the remaining CHF 0.5 billion (CER) of COVID-19-related test sales were in Centralised and Point of Care Solutions, mostly for the SARS-CoV-2 Rapid Antigen test launched in September 2020.

Centralised and Point of Care Solutions regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Europe, Middle East and Africa (EMEA)	2,846	2,714	+11	39.1	34.7
North America	1,463	1,523	+2	20.1	19.5
Rest of the World	2,964	3,582	−10	40.8	45.8
Total sales	**7,273**	**7,819**	**−1**	**100**	**100**

Overall sales decreased by 1% due to the combined effects of healthcare centres deprioritising routine care to allocate more resources to COVID-19 preparedness efforts and patients avoiding healthcare centres for fear of exposure to COVID-19. In EMEA, the decline of routine testing business has been more than compensated by the sales growth of the point-of-care COVID-19 testing products, while in North America, this decline was offset by the CustomBiotech business. In the Rest of World sales were lower, notably in China where lower immunodiagnostic reagent sales were not compensated by point-of-care COVID-19 testing sales.

Molecular Diagnostics regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Europe, Middle East and Africa (EMEA)	1,423	783	+93	37.8	37.1
North America	1,522	807	+100	40.5	38.3
Rest of the World	815	519	+70	21.7	24.6
Total sales	**3,760**	**2,109**	**+90**	**100**	**100**

Overall sales rose by 90%, with the sales growth being driven by the launch of the cobas SARS-CoV-2 PCR test in March 2020 and the cobas SARS-CoV-2 & Influenza A/B test in September 2020. Instrument sales have increased by 211%, with an installed base at the end of 2020 of over 1,000 units for the high-throughput cobas 6800/8800 systems.

Diabetes Care regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Europe, Middle East and Africa (EMEA)	945	1,120	−11	56.6	58.4
North America	288	309	−1	17.2	16.1
Rest of the World	437	489	+4	26.2	25.5
Total sales	**1,670**	**1,918**	**−5**	**100**	**100**

Sales decreased by 5% in line with the continued contracting of the blood glucose monitoring market due to patients switching to continuous glucose monitoring systems. The COVID-19 pandemic also had an impact. The decrease was reflected mainly in the EMEA region with an 11% decline, notably in Germany, Italy and the UK.

Tissue Diagnostics regional sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Europe, Middle East and Africa (EMEA)	277	280	+4	25.5	25.4
North America	594	614	+2	54.6	55.6
Rest of the World	217	210	+11	19.9	19.0
Total sales	**1,088**	**1,104**	**+5**	**100**	**100**

Sales increased by 5% due to growth in advanced staining instruments sales and recovery from manufacturing delays in the prior year in North America as well as increased sales in companion diagnostics. Sales were partially offset by lower testing volume due to the COVID-19 pandemic mostly in North America. Regionally, Asia-Pacific grew by 14% due to higher reagent sales.

Diagnostics Division – Sales by region

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Europe, Middle East and Africa (EMEA)	5,491	4,897	+19	39.5	37.9
North America	3,867	3,253	+26	28.4	25.1
Asia-Pacific	3,128	3,437	–3	22.7	26.5
Latin America	788	854	+14	5.7	6.6
Japan	517	509	+5	3.7	3.9
Total sales	**13,791**	**12,950**	**+14**	**100**	**100**

Molecular Diagnostics was the global driver of sales growth, mainly in North America and EMEA, offsetting the reductions in the routine testing business in the rest of the portfolio. Furthermore sales in EMEA were positively impacted by the Centralised and Point of Care Solutions business due to sales of SARS-CoV-2 Rapid Antigen test allowing fast triage decisions at point of care. The sales decrease in Asia-Pacific was driven by China (–11%) due to the decrease in routine testing following the COVID-19 pandemic restrictions. The Diagnostics Division continued to reduce channel inventory in China.

Diagnostics Division – Sales for E7 leading emerging markets

	2020 (CHF m)	2019 (CHF m)	% change (CER)	% of sales (2020)	% of sales (2019)
Brazil	179	241	+3	1.3	1.9
China	1,914	2,263	–11	14.0	17.3
India	184	192	+6	1.3	1.5
Mexico	152	143	+26	1.1	1.1
Russia	171	180	+12	1.2	1.4
South Korea	241	241	+7	1.7	1.9
Turkey	118	126	+22	0.9	1.0
Total sales	**2,959**	**3,386**	**–3**	**21.5**	**26.1**

Operating results

Diagnostics Division – Royalties and other operating income

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Royalty income	35	65	–44
Income from out-licensing agreements	8	0	–
Income from disposal of products and other	18	22	–13
Total – IFRS and Core basis	**61**	**87**	**–26**

Core royalties and other operating income decreased by 26% at CER driven by the base effect of the settlement of a royalty dispute in 2019 and due to lower royalty income in 2020 following lower immunodiagnostics sales by partner companies.

Diagnostics Division – Cost of sales

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Manufacturing cost of goods sold and period costs	(6,395)	(6,079)	+11
Royalty expenses	(100)	(103)	–2
Impairment of property, plant and equipment	(2)	(1)	+42
Cost of sales – Core basis	**(6,497)**	**(6,183)**	**+10**
Global restructuring plans	(103)	(120)	–10
Amortisation of intangible assets	(94)	(111)	–13
Impairment of intangible assets	0	(344)	–100
Total – IFRS basis	**(6,694)**	**(6,758)**	**+4**

Core costs increased by 10% at CER due to the higher sales and because of increased costs for the global supply chain due to the additional product volume and higher shipping rates. This increase was below the sales growth of 14% due to a favourable product mix. The core cost-of-sales ratio decreased by 0.8 percentage points to 47.0%. Global restructuring costs related to strategy plans. Impairment charges in 2019 related to intangible assets in Molecular Diagnostics and sequencing businesses.

Diagnostics Division – Marketing and distribution

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Marketing and distribution – Core basis	**(2,728)**	**(2,909)**	**0**
Global restructuring plans	(39)	(138)	–70
Amortisation of intangible assets	(9)	(8)	+25
Total – IFRS basis	**(2,776)**	**(3,055)**	**–3**

Core costs remained stable at CER, due to lower spending on congresses and travelling following the COVID-19 restrictions as well as cost containment measures offset by higher personnel expenses and inventory write-offs. On a core basis, marketing and distribution costs as a percentage of sales decreased to 19.8% compared to 22.5% in 2019. Global restructuring costs decreased due to significant projects related to the sales force in the prior year.

Diagnostics Division – Research and development

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Research and development – Core basis	**(1,556)**	**(1,468)**	**+10**
Global restructuring plans	(24)	(78)	–68
Amortisation of intangible assets	(8)	(7)	+23
Total – IFRS basis	**(1,588)**	**(1,553)**	**+6**

Core costs increased by 10% at CER, due to spending on COVID-19 products development and projects in cardiac disease within the Centralised and Point of Care Solutions portfolio as well as increased spending on digital solutions. As a percentage of sales, research and development core costs were stable at 11.3%. Global restructuring costs decreased due to costs for strategy plans in the previous year.

Diagnostics Division – General and administration

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Administration	(520)	(540)	+2
Pensions – past service costs	0	(1)	–100
Gains (losses) on disposal of property, plant and equipment and right-of-use assets	4	12	–62
Gains (losses) on disposal of divestment of subsidiaries	8	1	Over +500
Business taxes and capital taxes	(16)	(19)	–8
Other general items	17	36	–34
General and administration – Core basis	**(507)**	**(511)**	**+3**
Global restructuring plans	(56)	(5)	Over +500
Impairment of goodwill and intangible assets	(247)	(779)	–67
Mergers and acquisitions and alliance transactions	25	123	–79
Legal and environmental cases	(8)	(257)	–97
Total – IFRS basis	**(793)**	**(1,429)**	**–42**

Core costs increased by 3% at CER, and, as a percentage of sales, core costs decreased to 3.7% from 3.9% in 2019. Administration costs were 2% higher due to legal expenses in the US. The global restructuring plan costs in 2020 relate mainly to employee expenses for strategy plans. The impairment charges of CHF 247 million in 2020 are due to the goodwill impairment related to the AVL Medical Instruments and GeneWeave acquisitions. Mergers and acquisitions and alliance transactions in both 2020 and 2019 included income from the reversal of contingent consideration provisions. Legal and environmental costs in 2019 included litigation costs for the Meso case.

Financial position

Diagnostics Division – Net operating assets

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)	Movement: Transactions (CHF m)	Movement: CTA and other (CHF m)
Trade receivables	3,279	3,143	+4	+13	387	(251)
Inventories	2,986	2,359	+27	+29	684	(57)
Trade payables	(1,233)	(1,065)	+16	+20	(210)	42
Net trade working capital	**5,032**	**4,437**	**+13**	**+20**	**861**	**(266)**
Other receivables (payables)	(2,055)	(1,695)	+21	+27	(446)	86
Net working capital	**2,977**	**2,742**	**+9**	**+15**	**415**	**(180)**
Property, plant and equipment	6,640	6,598	+1	+5	314	(272)
Right-of-use assets	276	303	–9	–4	(11)	(16)
Goodwill and intangible assets	4,727	5,030	–6	+1	41	(344)
Provisions	(932)	(958)	–3	+3	(29)	55
Other long-term assets, net	76	63	+21	+35	22	(9)
Long-term net operating assets	**10,787**	**11,036**	**–2**	**+3**	**337**	**(586)**
Net operating assets	**13,764**	**13,778**	**0**	**+6**	**752**	**(766)**

The absolute amount of the movement between the 2020 and 2019 consolidated balances reported in Swiss francs is split between actual 2020 transactions (translated at average rates for 2019) and the currency translation adjustment (CTA) that arises on consolidation. The 2020 transactions include non-cash movements and therefore the movements in this table are not the same as the amounts shown in the operating free cash flow (which only includes the cash movements). A full consolidated balance sheet is given on page 51 of the Annual Financial Statements, and a reconciliation between that balance sheet and the information given above is on page 175.

Currency translation effects on balance sheet amounts. Compared to the start of the year the Swiss franc appreciated against almost all currencies, with the US dollar having a strong effect and, additionally, the Brazilian real and the Turkish lira having a significant effect on the net operating assets of the Diagnostics Division. This resulted in a negative translation impact. The exchange rates used are given on page 36.

Net working capital. Net working capital increased by 15% due to higher inventories and trade receivables partially offset by a higher net liability for other receivables/payables. Inventory increased by 29% due to the ongoing rollout of COVID-19-related products, including the recently launched SARS-CoV-2 Rapid Antigen test. The 13% increase in trade receivables is due to the sales growth of 14%. The increase in net liability for other receivables/payables came from higher product accruals and employee-related accruals in 2020.

Long-term net operating assets. Overall long-term net operating assets increased by 3% at CER, which was mainly attributable to the increase in property, plant and equipment from site investments in Germany, the US and Switzerland. This included COVID-19-related manufacturing expansion of CHF 137 million. Intangible assets were lower due to the goodwill impairment relating to the AVL Medical Instruments and GeneWeave acquisitions. This was partly offset by intangible asset additions from in-licensing transactions and asset acquisitions, in the Diagnostics Division of CHF 0.4 billion, mainly from the Stratos Genomics asset acquisition.

Free cash flow

Diagnostics Division – Operating free cash flow

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
Operating profit	**2,001**	**242**	**Over +500**	**Over +500**
– Depreciation, amortisation and impairment	1,604	2,483	–35	–31
– Provisions	22	169	–87	–87
– Equity compensation plans	102	92	+11	+15
– Other	264	187	+41	+47
Operating profit cash adjustments	**1,992**	**2,931**	**–32**	**–28**
Operating profit, net of operating cash adjustments	**3,993**	**3,173**	**+26**	**+41**
(Increase) decrease in net working capital	(738)	(276)	+167	+185
Investments in property, plant and equipment	(1,497)	(1,551)	–3	+3
Principal portion of lease liabilities paid	(110)	(115)	–4	+3
Investments in intangible assets	(77)	(268)	–71	–70
Operating free cash flow	**1,571**	**963**	**+63**	**+96**
– as % of sales	11.4	7.4	+4.0	+5.4

For the definition of free cash flow and a detailed breakdown see pages 171–173.

The operating free cash flow of the Diagnostics Division was CHF 1.6 billion, an increase of 96% compared to 2019. The cash generation of the business, measured by the operating profit, net of operating cash adjustments, increased by CHF 820 million (+41%) with the sales growth having a positive impact on the operating free cash flow. Net working capital increased and absorbed CHF 738 million of cash in 2020, which was attributable to increases in inventories and receivables offset by higher payables and accruals for the reasons described above in the 'Financial position' section. Capital expenditure was slightly higher due to site investments. The decline in investments in intangible assets was related to an in-licensing transaction in 2019. The appreciation of the Swiss franc had a significant negative impact on the free cash flows measures expressed in CHF terms.

Corporate operating results

Corporate operating results summary

	2020 (CHF m)	2019 (CHF m)	% change (CER)
Administration	(506)	(470)	+8
Business taxes and capital taxes	(18)	(13)	+39
Other general items	19	(19)	–
General and administration costs – Core basis [a]	**(505)**	**(502)**	**+8**
Global restructuring plans	(114)	(129)	–9
Legal and environmental cases	9	(9)	–
Total costs – IFRS basis	**(610)**	**(640)**	**+2**
Financial position			
Net working capital	(229)	(240)	–2
Long-term net operating assets	43	(5)	–
Net operating assets	**(186)**	**(245)**	**–24**
Free cash flow [b]			
Operating free cash flow	(609)	(578)	+13

a) See pages 168–171 for the definition of core results.
b) See pages 171–173 for the definition of free cash flow and a detailed breakdown.

General and administration costs increased by 8% at CER on a core basis with administration costs also higher by 8%. This increase is due to the build-up of the shared service centre network which provides services to both divisions. Total costs on an IFRS basis were affected by a lower level of restructuring activities in corporate functions. Corporate operating free cash flow showed a higher outflow due to higher administration costs and the settlement of payables.

Foreign exchange impact on operating results

The Group's exposure to movements in foreign currencies affecting its operating results, as expressed in Swiss francs, is summarised by the following key figures and comments.

Growth (reported at CER and in CHF)

	% change (CER) 2020	% change (CER) 2019	% change (CHF) 2020	% change (CHF) 2019
Pharmaceuticals Division				
Sales	–2	+11	–8	+10
Core operating profit	0	+12	–7	+11
Diagnostics Division				
Sales	+14	+3	+6	+1
Core operating profit	+50	+1	+30	–4
Group				
Sales	+1	+9	–5	+8
Core operating profit	+4	+11	–4	+10

Exchange rates against the Swiss franc

	31 December 2020	Average 2020	31 December 2019	Average 2019
1 USD	0.88	0.94	0.97	0.99
1 EUR	1.08	1.07	1.09	1.11
100 JPY	0.85	0.88	0.89	0.91

The results expressed in Swiss francs were negatively impacted by the appreciation of the Swiss franc against almost all currencies. The impact expressed in Swiss francs compared to constant exchange rates was 6 percentage points on sales, 8 percentage points on core operating profit and 9 percentage points on Core EPS. The sensitivity of Group sales and core operating profit to a 1% change in average foreign currency exchange rates against the Swiss franc during 2020 is shown in the table below.

Currency sensitivities

Impact of 1% increase in average exchange rate versus the Swiss franc	Sales (CHF m)	Core operating profit (CHF m)
US dollar	280	124
Euro	95	39
Japanese yen	43	35
All other currencies	148	78

The Group's revenues are primarily generated from sales of products to customers. Such revenues are mainly received in the local currency of the customer's home market, although in certain emerging markets invoicing is made in major international currencies such as the US dollar and euro. Cost of sales, marketing and some administration costs follow the same currency pattern as sales. The majority of research and development activities are incurred at the Group's global research facilities, and therefore the costs are mainly concentrated in US dollars, Swiss francs and euros. General and administration costs tend to be incurred mainly at central locations in the US, Switzerland and Germany. Chugai's revenues and costs are denominated in Japanese yen.

Treasury and taxation results

Treasury and taxation results

	2020 (CHF m)	2019 (CHF m)	% change (CHF)	% change (CER)
IFRS results				
Operating profit	18,543	17,548	+6	+16
Financing costs	(553)	(993)	–44	–41
Other financial income (expense)	(25)	59	–	–
Profit before taxes	**17,965**	**16,614**	**+8**	**+19**
Income taxes	(2,897)	(2,506)	+16	+26
Net income	**15,068**	**14,108**	**+7**	**+17**
Attributable to				
– Roche shareholders	14,295	13,497	+6	+17
– Non-controlling interests	773	611	+27	+29
Core results[a]				
Operating profit	21,536	22,479	–4	+4
Financing costs	(539)	(962)	–44	–41
Other financial income (expense)	(25)	59	–	–
Profit before taxes	**20,972**	**21,576**	**–3**	**+6**
Income taxes	(3,594)	(3,514)	+2	+10
Net income	**17,378**	**18,062**	**–4**	**+5**
Attributable to				
– Roche shareholders	16,577	17,416	–5	+4
– Non-controlling interests	801	646	+24	+27
Financial position				
Net debt	(1,882)	(2,505)	–25	–2
Lease liabilities	(1,195)	(1,219)	–2	+5
Pensions	(6,864)	(6,535)	+5	+7
Income taxes[c]	1,576	1,080	+46	+55
Equity investments	1,274	737	+73	+75
Derivatives, net	112	(88)	–	–
Collateral, net	(161)	148	–	–
Interest payable	(160)	(176)	–9	–1
Other non-operating assets, net	24	103	–77	–77
Total net assets (liabilities)[c]	**(7,276)**	**(8,455)**	**–14**	**–5**
Free cash flow[b]				
Treasury activities	(636)	(614)	+4	+9
Taxes paid	(3,236)	(3,543)	–9	–4
Total	**(3,872)**	**(4,157)**	**–7**	**–2**

a) See pages 168–171 for the definition of core results.
b) See pages 171–173 for the definition of free cash flow.
c) Provisional 2019 balance sheet amounts restated for final accounting of Spark Therapeutics acquisition (see Note 6 to the Annual Financial Statements).

Financing costs

Core financing costs were CHF 539 million, a decrease of 41% at CER compared to 2019. Interest expenses on debt decreased by 26% at CER to CHF 411 million mainly due to early repayment of debt in the second half of 2019. There were no losses on early debt redemption in 2020 (2019: CHF 202 million). The net interest cost of defined benefit pension plans decreased by 24% at CER due to lower discount rates in Germany and the US at the end of 2019. A full analysis of financing costs is given in Note 4 to the Annual Financial Statements.

Other financial income (expense)

Core other financial income (expense) was a net expense of CHF 25 million compared to a net income of CHF 59 million in 2019. Income from equity securities, which predominantly reflects the fair value changes and realised gains and losses in the Roche Venture Fund investments, notably the investment in Allakos, reported a net gain of CHF 170 million compared to a net gain of CHF 185 million in 2019. The net interest income decreased by 81% at CER to CHF 17 million due to lower liquid funds levels available for investments at lower interest rates compared to 2019. The net foreign exchange results, which reflect hedging costs and losses on unhedged positions, were losses of CHF 206 million compared to net losses of CHF 205 million in 2019. A full analysis of other financial income (expense) is given in Note 4 to the Annual Financial Statements.

Income taxes

The Group's effective core tax rate increased by 0.8 percentage points to 17.1% in 2020. This was mainly due to the impact of the resolution of several tax disputes which reduced the Group's effective core tax rate by 1.5 percentage points in 2020 and 2.1 percentage points in 2019.

The IFRS results saw the effective tax rate increase by 1.0 percentage points. In addition to the core impacts mentioned above, the non-core impacts from the 2019 Swiss tax reform and the impairments of goodwill that are not tax deductible also impacted the IFRS tax rate. The IFRS results also include the releases of contingent consideration provisions that are not taxable, hence the net effect in the 'Mergers and acquisitions and alliance transactions' line in the table below.

Further details of the Group's income tax expenses and related balance sheet positions are given in Note 5 to the Annual Financial Statements.

Analysis of the Group's effective tax rate

	2020			2019		
	Profit before tax (CHF m)	Income taxes (CHF m)	Tax rate (%)	Profit before tax (CHF m)	Income taxes (CHF m)	Tax rate (%)
Group's effective tax rate – Core basis	**20,972**	**(3,594)**	**17.1**	**21,576**	**(3,514)**	**16.3**
Global restructuring plans	(909)	168	18.5	(1,206)	236	19.6
Goodwill and intangible assets	(2,422)	576	23.8	(3,288)	338	10.3
Mergers and acquisitions and alliance transactions	(16)	12	75.0	29	23	–
Legal and environmental cases	338	(67)	19.8	(498)	81	16.3
Pension plan settlements	2	0	–	1	0	–
Transitional effect of Swiss tax reform	0	0	–	0	236	–
Normalisation of equity compensation plan tax benefit	0	8	–	0	94	–
Group's effective tax rate – IFRS basis	**17,965**	**(2,897)**	**16.1**	**16,614**	**(2,506)**	**15.1**

Financial position

The decrease in net debt was driven by the free cash flow of CHF 10.9 billion, offset by the annual dividend payments of CHF 8.0 billion and outflows on transactions in own equity instruments of CHF 2.1 billion. The net pension liability was higher due to a decrease in discount rates in most regions. The net tax assets increased mainly due to taxes paid exceeding the income tax expenses and the deferred tax effects of the pension plans. At 31 December 2020 the Group held equity investments with a market value of CHF 1.3 billion, which consist mostly of holdings in biotechnology and other pharmaceuticals companies which were acquired as part of licensing transactions and scientific collaborations or as investments of the Roche Venture Fund.

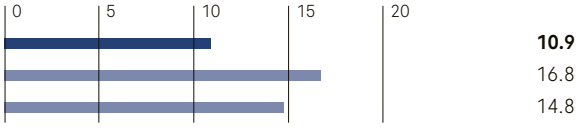
Free cash flow

The net cash outflow from treasury activities remained stable at CHF 0.6 billion. The lower interest payments were offset by investments in financial long-term assets, notably CHF 0.3 billion of equity in Sarepta. Total taxes paid in 2020 decreased to CHF 3.2 billion in line with the lower pre-tax profits.

Cash flows and net debt

Operating free cash flow in billions of CHF

Free cash flow in billions of CHF



Free cash flow in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Group
2020				
Operating profit – IFRS basis	17,152	2,001	(610)	18,543
Operating profit cash adjustments	3,313	1,992	86	5,391
Operating profit, net of operating cash adjustments	**20,465**	**3,993**	**(524)**	**23,934**
(Increase) decrease in net working capital	(1,296)	(738)	(26)	(2,060)
Investments in property, plant and equipment	(1,981)	(1,497)	(50)	(3,528)
Principal portion of lease liabilities paid	(250)	(110)	(9)	(369)
Investments in intangible assets	(3,085)	(77)	0	(3,162)
Operating free cash flow	**13,853**	**1,571**	**(609)**	**14,815**
Treasury activities				(636)
Taxes paid				(3,236)
Free cash flow				**10,943**
2019				
Operating profit – IFRS basis	17,946	242	(640)	17,548
Operating profit cash adjustments	5,467	2,931	94	8,492
Operating profit, net of operating cash adjustments	**23,413**	**3,173**	**(546)**	**26,040**
(Increase) decrease in net working capital	385	(276)	40	149
Investments in property, plant and equipment	(1,889)	(1,551)	(63)	(3,503)
Principal portion of lease liabilities paid	(248)	(115)	(9)	(372)
Investments in intangible assets	(1,125)	(268)	0	(1,393)
Operating free cash flow	**20,536**	**963**	**(578)**	**20,921**
Treasury activities				(614)
Taxes paid				(3,543)
Free cash flow				**16,764**

For the definition of free cash flow and a detailed breakdown see pages 171–173.

Operating free cash flow decreased by 21% at CER to CHF 14.8 billion (29% lower in CHF terms). This was due to increased net working capital, where the delivery of COVID-19-related tests led to a certain build-up in inventories as at 31 December 2020. There were also higher investments in in-licensing and alliance arrangements. In the Pharmaceuticals Division the lower sales and the increased research and development spending had a negative impact on the operating free cash flow, partly offset by lower spending on marketing and distribution. In the Diagnostics Division the sales growth had a positive impact on the operating free cash flow. The free cash flow of CHF 10.9 billion was 26% lower than in 2019 at CER (35% lower in CHF), as a result of lower operating free cash flow and higher financial long-term investments, partly offset by lower interest paid and lower taxes paid. The appreciation of the Swiss franc had a significant negative impact on the free cash flows measures expressed in CHF terms.

Net debt in millions of CHF

At 1 January 2020	
Cash and cash equivalents	6,075
Marketable securities	5,783
Long-term debt	(12,668)
Short-term debt	(1,695)
Net debt at beginning of period	**(2,505)**
Change in net debt during 2020	
Free cash flow	10,943
Dividend payments	(7,964)
Transactions in own equity instruments	(2,126)
Mergers and acquisitions, net of divestments of subsidiaries	(1,234)
Hedging and collateral arrangements	557
Currency translation, fair value and other movements	447
Change in net debt	**623**
At 31 December 2020	
Cash and cash equivalents	5,727
Marketable securities	6,607
Long-term debt	(10,220)
Short-term debt	(3,996)
Net debt at end of period	**(1,882)**

For the definition of net debt see page 176.

Net debt – currency profile in millions of CHF

	Cash and marketable securities 2020	2019	2020	Debt 2019
US dollar[a)]	1,848	1,159	(9,221)	(9,686)
Euro	2,642	3,452	(1,787)	(1,789)
Swiss franc	4,046	3,653	(2,503)	(2,503)
Japanese yen	3,165	2,967	0	0
Pound sterling	48	57	(92)	(97)
Other	585	570	(613)	(288)
Total	**12,334**	**11,858**	**(14,216)**	**(14,363)**

a) US dollar-denominated debt includes those bonds and notes denominated in euros that were swapped into US dollars, and therefore in the consolidated results they have economic characteristics equivalent to US dollar-denominated bonds and notes.

The net debt position of the Group at 31 December 2020 was CHF 1.9 billion, a decrease of CHF 0.6 billion from 31 December 2019. This was driven by the free cash flow of CHF 10.9 billion, offset by the annual dividend payments of CHF 8.0 billion and outflows on transactions in own equity instruments of CHF 2.1 billion. Transactions in own equity instruments relate to purchases in connection with the Group's equity compensation plans.

Contractual obligations and commitments

The Group has obligations and commitments, as set out in the table below. Carrying values are as shown in the consolidated balance sheet. The potential obligations shown are not discounted and are not risk-adjusted, unless otherwise noted below. Any amounts denominated in foreign currencies are translated into Swiss francs at the 31 December 2020 exchange rates. Provisions for legal and environmental matters are not included as the timing and amount of any cash outflow is uncertain and contingent on the development of the matters in question.

Contractual obligations and commitments as at 31 December 2020 in millions of CHF

	Potential obligation (undiscounted)					
	Less than 1 year	1–2 years	2–5 years	Over 5 years	Total	Carrying value
On-balance sheet						
Debt [21]						
– Bonds and notes	2,194	1,319	5,081	6,383	14,977	12,024
– Other debt	2,192	0	0	0	2,192	2,192
Contingent consideration [20, 31]	53	0	275	40	368	150
Accounts payable [17]	4,121	0	0	0	4,121	4,121
Other non-current liabilities [18]	0	455	372	320	1,147	1,107
– *of which lease liabilities*	*0*	*252*	*362*	*302*	*916*	*876*
Other current liabilities [19]	11,766	19	0	0	11,785	11,769
– *of which lease liabilities*	*335*	*0*	*0*	*0*	*335*	*319*
Unfunded defined benefit plans [26]	189	195	606	5,846	6,836	5,902
Total on-balance sheet commitments	**20,515**	**1,988**	**6,334**	**12,589**	**41,426**	**37,265**
Off-balance sheet						
Capital commitments for property, plant and equipment [8]	1,243	354	531	0	2,128	0
Leasing commitments [28]	0	15	112	521	648	0
Contract manufacturing commitments [31]	638	396	423	0	1,457	0
Alliance collaboration commitments [10]	1,218	1,114	1,198	774	4,304	0
Total off-balance sheet commitments	**3,099**	**1,879**	**2,264**	**1,295**	**8,537**	**0**
Total contractual commitments	**23,614**	**3,867**	**8,598**	**13,884**	**49,963**	**37,265**

References are to the Notes in the Annual Financial Statements.

Debt. This consists mainly of bonds and notes and includes the principal and interest on the Group's debt instruments. Other debt is mainly commercial paper. The carrying values are discounted based on the interest rates inherent in the instruments.

Contingent consideration. These are potential payments arising from mergers and acquisitions. The carrying values are risk-adjusted and discounted.

Lease liabilities. These are the future obligations under non-cancellable lease contracts.

Unfunded defined benefit plans. These are mainly the pension plans in the Group's German affiliates, where the fully reserved pension obligations are used for self-financing of the local affiliates' operations. The carrying values are discounted. Future company contributions to the Group's funded plans are not shown in the above table.

Capital commitments for property, plant and equipment. These are non-cancellable commitments for the purchase and construction mainly at the Roche sites in Basel, Switzerland, South San Francisco, US, and Mannheim, Germany, and also at the Chugai research and development site in Yokohama, Japan.

Leasing commitments. These are the major non-cancellable commitments for signed lease agreements where the lease term has not yet started. These mainly relate to Foundation Medicine's site in Boston, US.

Contract manufacturing commitments. These are the future minimum take-or-pay commitments to purchase inventories arising from the Group's major long-term agreements with external Contract Manufacturing Organisations ('CMOs').

Alliance collaboration commitments. These are potential upfront and milestone payments that may become due from the Group's in-licensing and alliance arrangements and intangible asset purchase agreements, including asset acquisitions. Potential payments to alliance partners and for asset purchase agreements within the next three years are included assuming all projects currently in development are successful. Potential payments beyond three years are only included for asset purchase agreements.

Pensions and other post-employment benefits

Post-employment benefit plans are classified for IFRS as 'defined contribution plans' if the Group pays fixed contributions into a separate fund or to a third-party financial institution and will have no further legal or constructive obligation to pay further contributions. In 2020 expenses for the Group's defined contribution plans were CHF 409 million (2019: CHF 410 million). All other plans are classified as 'defined benefit plans', even if the Group's potential obligation is minor or has a relatively remote possibility of arising. Plans are usually established as trusts which are independent of the Group and are funded by payments from the Group and by employees, but in some cases the plan is unfunded and the Group pays pensions to retired employees directly from its own financial resources. In 2020 expenses for the Group's defined benefit plans were CHF 757 million (2019: CHF 738 million).

Defined benefit plans

Funding status and balance sheet position

	2020 (CHF m)	2019 (CHF m)
Funded plans		
– Fair value of plan assets	17,967	17,187
– Defined benefit obligation	(19,047)	(18,586)
Over (under) funding	**(1,080)**	**(1,399)**
Unfunded plans		
– Defined benefit obligation	(5,902)	(5,269)
Total funding status	**(6,982)**	**(6,668)**
Limit on asset recognition	0	0
Reimbursement rights	118	133
Net recognised asset (liability)	**(6,864)**	**(6,535)**

Overall the funding status on an IFRS basis of the Group's funded defined benefit plans increased to 94% compared to 92% at the start of the year. This came from an increase in the fair value of plan assets partly offset by a higher defined benefit obligation due to a decrease in discount rates in most regions. The funding status of the pension funds is monitored by the local pension fund governance bodies as well as being closely reviewed at a Group level. The total cash outflow from the Group's defined benefit plans in 2020 was CHF 0.6 billion compared to CHF 0.7 billion in 2019. There were higher additional contributions paid into the Group's pension plans in Japan in 2020 and 2019.

The unfunded plans are mainly those in the Group's German affiliates, where the fully reserved pension obligations are invested in the local affiliate's operations. The unfunded liabilities for these plans increased during 2020 due to a decrease in the eurozone discount rate.

Full details of the Group's pensions and other post-employment benefits are given in Note 26 to the Annual Financial Statements.

Roche shares

Share price and market capitalisation (at 31 December)

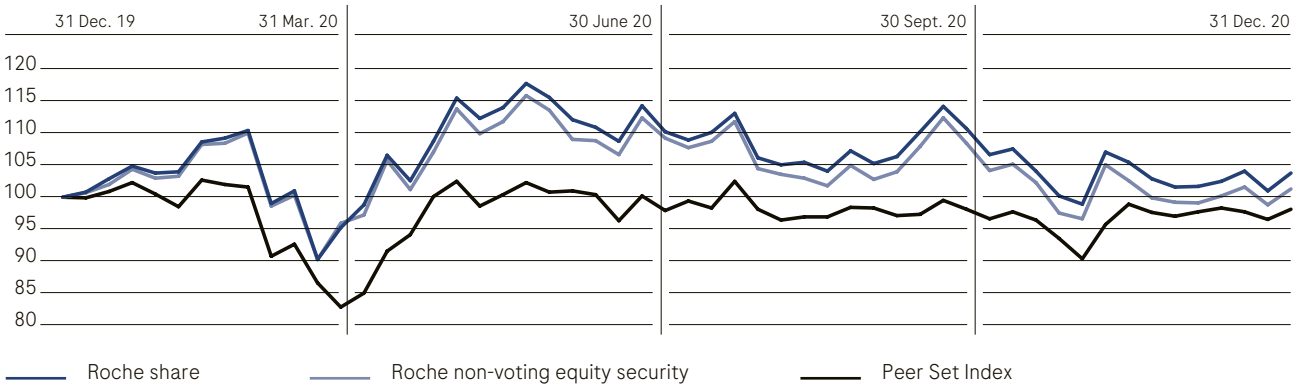
	2020	2019	% change (CHF)
Share price (CHF)	310.00	307.60	+1
Non-voting equity security *(Genussschein)* price (CHF)	309.00	314.00	–2
Market capitalisation (billions of CHF)	264	268	–1

In 2020 Roche ranked number 4 among a peer group consisting of Roche and 15 other healthcare companies[a)] for Total Shareholder Return (TSR), defined as share price growth plus dividends, measured in Swiss francs at actual exchange rates. At constant exchange rates (CER) Roche ranked number 6, with the year-end return being +3.8% for Roche shares and +1.3% for Roche non-voting equity securities. The combined performance of share and non-voting equity security was +1.8% compared to a weighted average return for the peer group of –1.9% in CHF terms and +4.7% at CER.

2020 was a year with very high volatility at the stock markets. Most equity markets recovered after heavy losses in the first quarter of 2020. The Swiss Market Index (SMI) stayed stable, outperforming most European indices but trailing major US indices. The global healthcare sector grew. Roche outperformed most peers, in CHF terms, with strong sales growth in Diagnostics and launches of new products.

a) Peer group for 2020: Abbott, AbbVie, Amgen, Astellas, AstraZeneca, Bayer, Bristol-Myers Squibb, GlaxoSmithKline, Johnson & Johnson, Lilly, Merck & Co., Novartis, Pfizer, Roche, Sanofi and Takeda.

Total Shareholder Return development



Source: Refinitiv Eikon. Data for Roche and the peer index has been re-based to 100 at 1 January 2020. The Peer Index was converted into Swiss francs at daily actual exchange rates. Currency fluctuations have an influence on the representation of the relative performance of Roche versus the peer index.

Proposed dividend

The Board of Directors is proposing an increase of 1% in the dividend for 2020 to CHF 9.10 per share and non-voting equity security (2019: CHF 9.00) for approval at the Annual General Meeting. This would be the 34th consecutive increase in the dividend. If the dividend proposal is approved by shareholders, dividend payments on the total shares and non-voting equity securities will amount to CHF 7.8 billion (2019: CHF 7.8 billion), resulting in a pay-out ratio (based on core net income) of 47.5% (2019: 44.6%). Based on the prices at year-end 2020, the dividend yield on the Roche share was 2.9% (2019: 2.9%) and the yield on the non-voting equity security was also 2.9% (2019: 2.9%). Further information on the Roche securities is given on pages 177 to 178.

Information per share and non-voting equity security

	2020 (CHF)	2019 (CHF)	% change (CHF)
EPS – Basic	16.73	15.77	+6
EPS – Diluted	16.52	15.62	+6
Core EPS – Basic	19.40	20.35	–5
Core EPS – Diluted	19.16	20.16	–5
Equity attributable to Roche shareholders per share	42.60	38.27	+11
Dividend per share	9.10	9.00	+1

For further details please refer to Notes 22 and 29 of the Annual Financial Statements and page 171. The pay-out ratio is calculated as dividend per share divided by core earnings per share.

Debt

During 2020 there were no scheduled debt repayments or debt redemptions. No new debt was issued.

The maturity schedule of the Group's bonds and notes outstanding at 31 December 2020 is shown in the table below.

Bonds and notes: nominal amounts at 31 December 2020 by contractual maturity

	US dollar (USD m)	Euro (EUR m)	Pound sterling (GBP m)	Swiss franc (CHF m)	Total[a] (USD m)	Total[a] (CHF m)
2021	644	1,140[b]	0	0	2,046	1,803
2022	650	0	0	500	1,217	1,073
2023	390	650	77	0	1,294	1,140
2024	589	0	0	750	1,440	1,269
2025	506	1,000	0	500	2,303	2,030
2026–2030	2,500	0	0	750	3,351	2,953
2031 and beyond	2,054	0	0	0	2,054	1,810
Total	**7,333**	**2,790**	**77**	**2,500**	**13,705**	**12,078**

a) Total translated at 31 December 2020 exchange rates.
b) Of the proceeds from these bonds and notes, EUR 850 million have been swapped into US dollars, and therefore in the consolidated results these bonds and notes have economic characteristics equivalent to US dollar-denominated bonds and notes.

The Group plans to meet its debt obligations using existing liquid funds as well as cash generated from business operations. In the full year 2020 the free cash flow was CHF 10.9 billion, which included the cash generated from operations, as well as payment of interest and tax.

For short-term financing requirements, the Group has a commercial paper program in the US under which it can issue up to USD 7.5 billion of unsecured commercial paper notes and has committed credit lines of USD 7.5 billion available as back-stop lines. As at 31 December 2020 commercial paper notes totalling USD 1.8 billion were outstanding (2019: USD 1.4 billion). For longer-term financing the Group maintains strong long-term investment-grade credit ratings of AA by Standard & Poor's and Aa3 by Moody's which should facilitate efficient access to international capital markets.

Further information on the Group's debt is given in Note 21 to the Annual Financial Statements.

Financial risks

At 31 December 2020 the Group had a net debt position of CHF 1.9 billion (2019: CHF 2.5 billion). The financial assets of the Group are managed in a conservative way with the objective to meet the Group's financial obligations at all times.

Asset allocation. A considerable portion of the cash and marketable securities the Group currently holds is being used for debt repayment. Liquid funds are either held as cash or are invested in high-quality, investment-grade fixed income securities with an investment horizon to meet those liquidity requirements.

Cash and marketable securities

	2020 (CHF m)	2020 (% of total)	2019 (CHF m)	2019 (% of total)
Cash and cash equivalents	5,727	46	6,075	51
Money market instruments	6,006	49	4,963	42
Debt securities	590	5	807	7
Equity securities	11	0	13	0
Total cash and marketable securities	**12,334**	**100**	**11,858**	**100**

Credit risk. Credit risk arises from the possibility that counterparties to transactions may default on their obligations causing financial losses for the Group. The rating profile of the Group's CHF 12.3 billion of cash and fixed income marketable securities remained strong with 94% being invested in the A-AAA range. The Group has signed netting and collateral agreements with the counterparties in order to mitigate counterparty risk on derivative positions.

The Group has trade receivables of CHF 11.0 billion. Since the beginning of 2010 there have been financial difficulties in Southern European countries, notably Spain, Italy, Greece and Portugal. The Group is a leading supplier to the healthcare sectors in these countries and at 31 December 2020 has trade receivables of EUR 0.5 billion (CHF 0.5 billion) with public customers in these countries. This is a decrease of 13% compared to 31 December 2019 in euro terms. The Group uses different measures to improve collections in these countries, including intense communication with customers, factoring, negotiations of payment plans, charging of interest for late payments, and legal actions. Since 2011 the Group's trade receivables balance in Southern Europe has decreased by 67% in euro terms.

Liquidity risk. Liquidity risk arises through a surplus of financial obligations over available financial assets due at any point in time. The Group's approach to liquidity risk is to maintain sufficient readily available reserves in order to meet its liquidity requirements at any point in time. In addition to the current liquidity position, the Group has strong cash generation ability. Those future cash flows will be used to repay debt instruments in the coming years.

Roche enjoys strong long-term investment-grade credit ratings of AA by Standard & Poor's and Aa3 by Moody's. At the same time Roche is rated at the highest available short-term ratings by those agencies. In the event of financing requirements, the ratings and the strong credit of Roche should permit efficient access to international capital markets, including the commercial paper market. The Group has committed credit lines with various financial institutions totalling USD 7.5 billion available as back-stop lines for the commercial paper program. As at 31 December 2020 no debt has been drawn under these credit lines.

Market risk. Market risk arises from changing market prices of the Group's financial assets or financial liabilities. The exposures are predominantly related to changes in interest rates, foreign exchange rates and equity prices. The Group uses Value-at-Risk (VaR) to assess the impact of market risk on its financial instruments. VaR data indicates the value range within which a given financial instrument will fluctuate with a pre-set probability as a result of movements in market prices. The Group's VaR decreased since 31 December 2019 reflecting the reduction in US interest rates during 2020.

Interest rate risk. Interest rate risk arises from movements in interest rates which could affect the Group's financial result or the value of the Group equity. The Group may use interest rate derivatives to manage its interest rate-related exposure and financial result.

Further information on financial risk management and financial risks and the VaR methodology is included in Note 31 to the Annual Financial Statements.

International Financial Reporting Standards

The Roche Group has been using International Financial Reporting Standards (IFRS) to report its consolidated results since 1990.

New and revised standards applied in 2020

In 2020 the Group has implemented various minor amendments to existing standards and interpretations, which have no material impact on the Group's overall results and financial position. The amendments to IFRS 3 'Business Combinations' on the definition of a business, which are mandatorily applicable in 2020, were early adopted by the Group in 2018.

Roche Group Consolidated Financial Statements

Roche Group consolidated income statement for the year ended 31 December 2020 in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Group
Sales [2, 3]	44,532	13,791	–	58,323
Royalties and other operating income [2, 3]	1,959	61	–	2,020
Revenue [2, 3]	**46,491**	**13,852**	**–**	**60,343**
Cost of sales	(9,483)	(6,694)	–	(16,177)
Marketing and distribution	(6,796)	(2,776)	–	(9,572)
Research and development [2]	(11,421)	(1,588)	–	(13,009)
General and administration	(1,639)	(793)	(610)	(3,042)
Operating profit [2]	**17,152**	**2,001**	**(610)**	**18,543**
Financing costs [4]				(553)
Other financial income (expense) [4]				(25)
Profit before taxes				**17,965**
Income taxes [5]				(2,897)
Net income				**15,068**
Attributable to				
– Roche shareholders [22]				14,295
– Non-controlling interests [24]				773
Earnings per share and non-voting equity security [29]				
Basic (CHF)				16.73
Diluted (CHF)				16.52

Roche Group consolidated income statement for the year ended 31 December 2019 in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Group
Sales [2, 3]	48,516	12,950	–	61,466
Royalties and other operating income [2, 3]	2,198	87	–	2,285
Revenue [2, 3]	**50,714**	**13,037**	**–**	**63,751**
Cost of sales	(11,593)	(6,758)	–	(18,351)
Marketing and distribution	(7,905)	(3,055)	–	(10,960)
Research and development [2]	(11,221)	(1,553)	–	(12,774)
General and administration	(2,049)	(1,429)	(640)	(4,118)
Operating profit [2]	**17,946**	**242**	**(640)**	**17,548**
Financing costs [4]				(993)
Other financial income (expense) [4]				59
Profit before taxes				**16,614**
Income taxes [5]				(2,506)
Net income				**14,108**
Attributable to				
– Roche shareholders [22]				13,497
– Non-controlling interests [24]				611
Earnings per share and non-voting equity security [29]				
Basic (CHF)				15.77
Diluted (CHF)				15.62

Roche Group consolidated statement of comprehensive income in millions of CHF

	Year ended 31 December 2020	2019
Net income recognised in income statement	**15,068**	**14,108**
Other comprehensive income (OCI)		
Remeasurements of defined benefit plans [22]	(187)	(414)
Fair value changes on equity investments at fair value through OCI [22]	99	(3)
Items that will never be reclassified to the income statement	**(88)**	**(417)**
Fair value changes on debt securities at fair value through OCI [22]	7	12
Cash flow hedges [22]	(39)	(39)
Currency translation of foreign operations [22]	(1,657)	(442)
Items that are or may be reclassified to the income statement	**(1,689)**	**(469)**
Other comprehensive income, net of tax	**(1,777)**	**(886)**
Total comprehensive income	**13,291**	**13,222**
Attributable to		
– Roche shareholders [22]	12,656	12,641
– Non-controlling interests [24]	635	581
Total	**13,291**	**13,222**

Roche Group consolidated balance sheet in millions of CHF

	31 December 2020	31 December 2019	31 December 2018
Non-current assets			
Property, plant and equipment [8]	22,158	22,173	21,818
Right-of-use assets [28]	1,112	1,145	–
Goodwill [9]	9,249	10,295	8,948
Intangible assets [10]	12,017	10,751	9,346
Deferred tax assets [5]	5,459	4,979	3,895
Defined benefit plan assets [26]	967	945	877
Other non-current assets [15]	2,234	1,549	1,389
Total non-current assets	**53,196**	**51,837**	**46,273**
Current assets			
Inventories [11]	7,194	6,055	6,621
Accounts receivable [12]	10,154	10,440	9,776
Current income tax assets [5]	149	237	208
Other current assets [16]	3,111	2,664	2,521
Marketable securities [13]	6,607	5,783	6,437
Cash and cash equivalents [14]	5,727	6,075	6,681
Total current assets	**32,942**	**31,254**	**32,244**
Total assets	**86,138**	**83,091**	**78,517**
Non-current liabilities			
Long-term debt [21]	(10,220)	(12,668)	(16,077)
Deferred tax liabilities [5]	(353)	(298)	(384)
Defined benefit plan liabilities [26]	(7,831)	(7,480)	(7,017)
Provisions [20]	(1,453)	(1,515)	(1,452)
Other non-current liabilities [18]	(1,107)	(1,144)	(188)
Total non-current liabilities	**(20,964)**	**(23,105)**	**(25,118)**
Current liabilities			
Short-term debt [21]	(3,996)	(1,695)	(2,693)
Current income tax liabilities [5]	(3,679)	(3,838)	(3,808)
Provisions [20]	(1,836)	(2,885)	(2,329)
Accounts payable [17]	(4,121)	(3,822)	(3,526)
Other current liabilities [19]	(11,769)	(11,879)	(10,677)
Total current liabilities	**(25,401)**	**(24,119)**	**(23,033)**
Total liabilities	**(46,365)**	**(47,224)**	**(48,151)**
Total net assets	**39,773**	**35,867**	**30,366**
Equity			
Capital and reserves attributable to Roche shareholders [22]	36,341	32,747	27,622
Equity attributable to non-controlling interests [24]	3,432	3,120	2,744
Total equity	**39,773**	**35,867**	**30,366**

As disclosed in Note 6, the balance sheet at 31 December 2019 has been restated following the finalisation of the valuation of the net assets acquired related to the Spark Therapeutics acquisition in 2019. A reconciliation to the previously published balance sheet is provided in Note 6. As disclosed in Note 28, the Group changed its accounting policies for leases following the implementation of IFRS 16 'Leases', effective 1 January 2019. The Group applied the cumulative catch-up method for the transition, meaning that the comparative balance sheet as at 31 December 2018 was not restated.

Roche Group consolidated statement of cash flows in millions of CHF

	Year ended 31 December 2020	2019
Cash flows from operating activities		
Cash generated from operations [30]	25,614	26,793
(Increase) decrease in net working capital	(2,060)	149
Payments made for defined benefit plans [26]	(601)	(676)
Utilisation of provisions [20]	(1,390)	(828)
Disposal of products	239	490
Income taxes paid [5]	(3,236)	(3,543)
Total cash flows from operating activities	**18,566**	**22,385**
Cash flows from investing activities		
Purchase of property, plant and equipment	(3,528)	(3,503)
Purchase of intangible assets	(3,162)	(1,393)
Disposal of property, plant and equipment	70	71
Disposal of intangible assets	0	2
Business combinations [6]	(11)	(4,706)
Asset acquisitions [6]	(1,168)	0
Divestment of subsidiaries	3	3
Interest and dividends received [30]	16	69
Sales of equity securities and debt securities	353	587
Purchases of equity securities and debt securities	(169)	(221)
Sales (purchases) of money market instruments and time accounts over three months, net	(1,181)	461
Other investing cash flows	(290)	(4)
Total cash flows from investing activities	**(9,067)**	**(8,634)**
Cash flows from financing activities		
Proceeds from issue of bonds and notes [21]	0	0
Redemption and repurchase of bonds and notes [21]	0	(5,414)
Increase (decrease) in commercial paper [21]	318	858
Increase (decrease) in other debt [21]	341	153
Hedging and collateral arrangements	557	(137)
Changes in ownership interest in subsidiaries	0	(21)
Equity contribution by non-controlling interests	0	13
Interest paid	(422)	(624)
Principal portion of lease liabilities paid [30]	(369)	(372)
Dividends paid [30]	(7,964)	(7,682)
Equity-settled equity compensation plans, net of transactions in own equity [27]	(2,126)	(947)
Other financing cash flows	(1)	0
Total cash flows from financing activities	**(9,666)**	**(14,173)**
Net effect of currency translation on cash and cash equivalents	(181)	(184)
Increase (decrease) in cash and cash equivalents	**(348)**	**(606)**
Cash and cash equivalents at 1 January	6,075	6,681
Cash and cash equivalents at 31 December [14]	**5,727**	**6,075**

Roche Group consolidated statement of changes in equity in millions of CHF

	Share capital	Retained earnings	Fair value reserves	Hedging reserves	Translation reserves	Total	Non-controlling interests	Total equity
Year ended 31 December 2019								
At 1 January 2019	160	34,935	28	47	(7,548)	27,622	2,744	30,366
Implementation of IFRS 16 'Leases' [28]	–	(4)	–	–	–	(4)	0	(4)
At 1 January 2019 (revised)	**160**	**34,931**	**28**	**47**	**(7,548)**	**27,618**	**2,744**	**30,362**
Net income recognised in income statement	–	13,497	–	–	–	13,497	611	14,108
Net change in fair value – financial assets at fair value through OCI	–	23	(13)	–	–	10	(1)	9
Cash flow hedges	–	–	–	(34)	–	(34)	(5)	(39)
Currency translation of foreign operations	–	–	0	0	(417)	(417)	(25)	(442)
Remeasurements of defined benefit plans	–	(415)	-	–	–	(415)	1	(414)
Total comprehensive income	**–**	**13,105**	**(13)**	**(34)**	**(417)**	**12,641**	**581**	**13,222**
Dividends	–	(7,449)	–	–	–	(7,449)	(213)	(7,662)
Equity compensation plans, net of transactions in own equity	–	(52)	–	–	–	(52)	5	(47)
Changes in ownership interest in subsidiaries	–	(9)	–	–	–	(9)	(12)	(21)
Changes in non-controlling interests [24]	–	(2)	–	–	–	(2)	2	–
Equity contribution by non-controlling interests [24]	–	–	–	–	–	–	13	13
At 31 December 2019	**160**	**40,524**	**15**	**13**	**(7,965)**	**32,747**	**3,120**	**35,867**
Year ended 31 December 2020								
At 1 January 2020	160	40,524	15	13	(7,965)	32,747	3,120	35,867
Net income recognised in income statement	–	14,295	–	–	–	14,295	773	15,068
Net change in fair value – financial assets at fair value through OCI	–	13	93	–	–	106	0	106
Cash flow hedges	–	–	–	(29)	–	(29)	(10)	(39)
Currency translation of foreign operations	–	–	(2)	0	(1,515)	(1,517)	(140)	(1,657)
Remeasurements of defined benefit plans	–	(199)	–	–	–	(199)	12	(187)
Total comprehensive income	**–**	**14,109**	**91**	**(29)**	**(1,515)**	**12,656**	**635**	**13,291**
Dividends	–	(7,700)	–	–	–	(7,700)	(330)	(8,030)
Equity compensation plans, net of transactions in own equity	–	(1,360)	–	–	–	(1,360)	5	(1,355)
Changes in ownership interest in subsidiaries	–	0	–	–	–	0	0	0
Changes in non-controlling interests [24]	–	(2)	–	–	–	(2)	2	–
Equity contribution by non-controlling interests [24]	–	–	–	–	–	–	0	0
At 31 December 2020	**160**	**45,571**	**106**	**(16)**	**(9,480)**	**36,341**	**3,432**	**39,773**

As disclosed in Note 28, the Group changed its accounting policies for leases following the implementation of IFRS 16 'Leases', effective 1 January 2019. Details of the additional assets and liabilities reported effective 1 January 2019 are provided in Note 28.

Notes to the Roche Group Consolidated Financial Statements

1. General accounting principles

Basis of preparation

The consolidated financial statements (hereafter 'the Annual Financial Statements') of the Roche Group have been prepared in accordance with International Financial Reporting Standards (IFRS) and comply with Swiss law. They have been prepared using the historical cost convention except for items that are required to be accounted for at fair value. They were approved for issue by the Board of Directors on 1 February 2021 and are subject to approval by the Annual General Meeting of shareholders on 16 March 2021.

These financial statements are the Annual Financial Statements of Roche Holding Ltd, a company registered in Switzerland, and its subsidiaries ('the Group').

The Group's significant accounting policies and changes in accounting policies are disclosed in Note 34.

Key accounting judgements, estimates and assumptions

The preparation of the Annual Financial Statements requires management to make judgements, estimates and assumptions that affect the reported amounts of revenues, expenses, assets, liabilities and contingent amounts. Actual outcomes could differ from those management estimates. The estimates and underlying assumptions are reviewed on an ongoing basis and are based on historical experience and various other factors. Revisions to estimates are recognised in the period in which the estimate is revised. The following are considered to be the key accounting judgements, estimates and assumptions made and are believed to be appropriate based upon currently available information.

Revenue. The nature of the Group's business is such that many sales transactions do not have a simple structure and may consist of various performance obligations that are satisfied at different times. Contracts entered into in the Diagnostics Division typically include performance obligations for instruments (including those provided under leasing arrangements), reagents and other consumables, and services. Instruments may be sold in cash sales transactions at discounted prices. Where instruments are provided under operating lease arrangements, some or the entire lease revenue may be variable and subject to subsequent reagents sales. Sales, net of discounts, are based on estimates regarding the related obligations, including their stand-alone selling prices. It requires judgement to determine when different obligations are satisfied, including whether enforceable purchase commitments for further obligations exist and when they arise. Out-licensing agreements may be entered into with no further obligation or may include commitments to conduct research, late-stage development, regulatory approval, co-marketing or manufacturing. These may be settled by a combination of upfront payments, milestone payments, other licensing fees, and reimbursements for services provided. Whether to consider these commitments as a single performance obligation or separate ones, or even being in scope of IFRS 15 'Revenues from Contracts with Customers', is not straightforward and requires some judgement. Depending on the conclusion, this may result in all revenue being calculated at inception and either being recognised at once or spread over the term of a longer performance obligation.

Sales are recorded net of allowances for estimated rebates, chargebacks, cash discounts and estimates of product returns, all of which are established at the time of sale. All product sales allowances are based on estimates of the amounts earned or to be claimed on the related sales. At 31 December 2020 the Group had CHF 4,165 million in provisions and accruals for expected sales returns, chargebacks and other rebates, including Medicaid in the US and similar rebates in other countries. The provisions and accruals relating to the US Pharmaceuticals business amounted to CHF 1,751 million, of which CHF 416 million were associated with expected sales returns. These estimates take into consideration historical experience, current contractual and statutory requirements, specific known market events and trends such as competitive pricing and new product introductions, estimated inventory levels, and the shelf life of products. If actual future results vary, these estimates need to be adjusted, with an effect on sales and earnings in the period of the adjustment.

Business combinations. The Group initially recognises the fair value of identifiable assets acquired, the liabilities assumed, any non-controlling interest and the consideration transferred in a business combination. Management judgement is particularly involved in the assessment of whether or not the net assets acquired constitute a business and in the recognition and fair value measurement of intellectual property, inventories, contingent liabilities and contingent consideration. In making this assessment, management considers the underlying economic substance of the items concerned in addition to the contractual terms. Management also applies as it considers appropriate the optional 'concentration test' as set out in IFRS 3 'Business Combinations' to aid the assessment of whether a transaction represents a business combination or is simply in substance the purchase of a single asset or group of similar assets.

Impairment of property, plant and equipment, right-of-use assets, goodwill and intangible assets. At 31 December 2020 the Group had CHF 22,158 million in property, plant and equipment (see Note 8), CHF 1,112 million in right-of-use assets (see Note 28), CHF 9,249 million in goodwill (see Note 9) and CHF 12,017 million in intangible assets (see Note 10). Goodwill and intangible assets not yet available for use are reviewed annually for impairment. Property, plant and equipment, right-of-use assets and intangible assets in use are assessed for impairment when there is a triggering event that provides evidence that an asset may be impaired. To assess whether any impairment exists, estimates of expected future cash flows are used. Actual outcomes could vary significantly from such estimates. Factors such as changes in discount rates, the planned use of buildings, machinery or equipment or closure of facilities, the presence of competition, technical obsolescence and lower-than-anticipated product sales could lead to shorter useful lives or impairment.

Impairment of financial assets. At 31 December 2020 the Group had CHF 515 million in allowance for doubtful accounts for trade and lease receivables (see Note 12). The allowance for doubtful accounts is based on assumptions about risk of default and expected loss rates. The Group uses judgement in making these assumptions and selecting the inputs to the calculation of the allowance for doubtful accounts, based on the company's past experience, existing market conditions as well as forward-looking estimates at the end of each reporting period.

Pensions and other post-employment benefits. The Group operates a number of defined benefit plans, and the fair values of the recognised plan assets and liabilities are based upon statistical and actuarial calculations. The measurement of the net defined benefit obligation is particularly sensitive to changes in the discount rate, inflation rate, expected mortality and medical cost trend rate assumptions. At 31 December 2020 the present value of the Group's defined benefit obligation is CHF 24,949 million (see Note 26). The actuarial assumptions used may differ materially from actual results due to changes in market and economic conditions, longer or shorter lifespans of participants, and other changes in the factors being assessed. These differences could impact the defined benefit plan assets and liabilities recognised in the balance sheet in future periods.

Legal provisions. The Group provides for anticipated legal settlement costs when there is a probable outflow of resources that can be reliably estimated. Where no reliable estimate can be made, no provision is recorded and contingent liabilities are disclosed where material. At 31 December 2020 the Group had CHF 395 million in legal provisions. The status of significant legal cases is disclosed in Note 20. These estimates consider the specific circumstances of each legal case, relevant legal advice and are inherently judgemental due to the highly complex nature of legal cases. The estimates could change substantially over time as new facts emerge and each legal case progresses.

Environmental provisions. The Group provides for anticipated environmental remediation costs when there is a probable outflow of resources that can be reasonably estimated. At 31 December 2020 the Group had CHF 443 million in environmental provisions (see Note 20). Environmental provisions consist primarily of costs to fully clean and refurbish contaminated sites, including landfills, and to treat and contain contamination at certain other sites. These estimates are inherently judgemental due to uncertainties related to the detection of previously unknown contamination, the method and extent of remediation, the percentage of the problematic materials attributable to the Group at the remediation sites, and the financial capabilities of other potentially responsible parties. The estimates could change substantially over time as new facts emerge and each environmental remediation progresses.

Contingent consideration provisions. The Group makes provision for the estimated fair value of contingent consideration arrangements arising from business combinations. At 31 December 2020 the Group had CHF 150 million in contingent consideration provisions (see Note 20) and the total potential payments under contingent consideration arrangements from business combinations could be up to CHF 368 million (see Note 31). The estimated amounts provided are the expected payments, determined by considering the possible scenarios of forecast sales and other performance criteria, the amount to be paid under each scenario, and the probability of each scenario, which is then discounted to a net present value. The estimates could change substantially over time as new facts emerge and each scenario develops.

Income taxes. At 31 December 2020 the Group had a current income tax net liability of CHF 3,530 million and a deferred tax net asset of CHF 5,106 million (see Note 5). Significant estimates are required to determine the current and deferred tax assets and liabilities. Some of these estimates are based on interpretations of existing tax laws or regulations. Where tax positions are uncertain, accruals are recorded within income tax liabilities for management's best estimate of the ultimate liability that is expected to arise based on the specific circumstances and the Group's historical experience. Factors that may have an impact on current and deferred taxes include changes in tax laws, regulations or rates, changing interpretations of existing tax laws or regulations, future levels of research and development spending and changes in pre-tax earnings.

Leases. Where the Group is the lessee, key judgements include assessing whether arrangements contain a lease and determining the lease term. To assess whether a contract contains a lease requires judgement about whether it depends on a specified asset, whether the Group obtains substantially all the economic benefits from the use of that asset, and whether the Group has a right to direct the use of the asset. In order to determine the lease term judgement is required as extension and termination options have to be assessed along with all facts and circumstances that may create an economic incentive to exercise an extension option, or not exercise a termination option. Estimates include calculating the discount rate which is based on the incremental borrowing rate. At 31 December 2020 the Group has CHF 1,112 million in right-of-use assets and CHF 1,195 million in lease liabilities (see Note 28).

Where the Group is the lessor, the treatment of leasing transactions is mainly determined by whether the lease is considered to be an operating or finance lease. In making this assessment, management looks at the substance of the lease, as well as the legal form, and makes a judgement about whether substantially all of the risks and rewards of ownership are transferred. Arrangements which do not take the legal form of a lease but that nevertheless convey the right to use an asset are also covered by such assessments.

Consolidation. The Group periodically undertakes transactions that may involve obtaining control or significant influence over other companies. These transactions include equity acquisitions, asset purchases and alliance agreements. In all such cases management makes an assessment as to whether the Group has control or significant influence over the other company, and whether it should be consolidated as a subsidiary or accounted for as an associated company. In making this assessment, management considers the underlying economic substance of the transaction in addition to the contractual terms.

Impact of the COVID-19 pandemic

The Group has assessed certain accounting matters that generally require consideration of forecast financial information taking into account the potential future impacts of the COVID-19 pandemic. The accounting matters assessed included, but were not limited to, the Group's provisions for product returns, allowances for doubtful accounts for trade and lease receivables, inventory allowances, the carrying value of goodwill, intangible assets, property, plant and equipment and defined benefit pension plan assets and liabilities. Any continued negative impacts from the pandemic in 2021 may have an impact on these, or other, matters.

Bad debt expenses and overdue receivables remained at relatively low levels. There were no significant costs for idle manufacturing capacity or inventory write-offs that could be directly attributed to COVID-19 factors, and only minor additional COVID-19-related costs were incurred on construction projects.

Intangible asset impairment charges of CHF 342 million were incurred as a result of a delay in clinical trials, partly caused by COVID-19, for the Spark Therapeutics' haemophilia A programme (see Note 10). No other impairment issues were noted for goodwill and intangible assets that can be directly attributed to the pandemic.

No impairment issues that can be directly attributed to the pandemic were noted for financial assets, although the volatility in global markets had a corresponding impact on the carrying value of equity investments held at fair value. Similarly, there was a certain volatility in the fair value of pension assets and discount rates during the first half of 2020, but the situation had largely stabilised by the end of the year, and no exceptional funding payments to the Group's pension plans are currently foreseen.

While there was no significant impact from the areas assessed on the Group's Annual Financial Statements, the Group will continue to monitor these areas of increased judgements and risk for material changes.

2. Operating segment information

The Group has two divisions, Pharmaceuticals and Diagnostics. Revenues are primarily generated from the sale of prescription pharmaceutical products and diagnostic instruments, reagents and consumables, respectively. Both divisions also derive revenues from the sale or licensing of products or technology to third parties. Residual operating activities from divested businesses and certain global activities are reported as 'Corporate'. These include the Corporate Executive Committee and global Group functions for communications, human resources, finance (including treasury and taxes), legal, safety and environmental services. Subdivisional information is also presented for the Roche Pharmaceuticals and Chugai operating segments within the Pharmaceuticals Division.

Divisional information in millions of CHF

	Pharmaceuticals		Diagnostics		Corporate		Group	
	2020	2019	2020	2019	2020	2019	2020	2019
Revenues from external customers								
Sales	44,532	48,516	13,791	12,950	–	–	58,323	61,466
Royalties and other operating income	1,959	2,198	61	87	–	–	2,020	2,285
Total	**46,491**	**50,714**	**13,852**	**13,037**	**–**	**–**	**60,343**	**63,751**
Revenues from other operating segments								
Sales	–	–	17	14	–	–	17	14
Royalties and other operating income	–	–	–	–	–	–	–	–
Elimination of interdivisional revenue							(17)	(14)
Total	**–**	**–**	**17**	**14**	**–**	**–**	**–**	**–**
Segment results								
Operating profit	17,152	17,946	2,001	242	(610)	(640)	18,543	17,548
Capital expenditure								
Business combinations	0	4,872	0	0	0	0	0	4,872
Asset acquisitions	914	0	322	0	0	0	1,236	0
Additions to property, plant and equipment	2,141	1,864	1,502	1,552	50	63	3,693	3,479
Additions to right-of-use assets	344	264	119	134	7	10	470	408
Additions to intangible assets	3,002	1,358	77	258	–	–	3,079	1,616
Total	**6,401**	**8,358**	**2,020**	**1,944**	**57**	**73**	**8,478**	**10,375**
Research and development								
Research and development costs	11,421	11,221	1,588	1,553	–	–	13,009	12,774
Other segment information								
Depreciation of property, plant and equipment	1,263	1,227	1,127	1,109	61	73	2,451	2,409
Depreciation of right-of-use assets	236	229	112	112	9	10	357	351
Amortisation of intangible assets	1,639	1,406	111	126	–	–	1,750	1,532
Impairment (reversal) of property, plant and equipment	(30)	246	4	13	0	2	(26)	261
Impairment (reversal) of right-of-use assets	2	(12)	3	0	0	0	5	(12)
Impairment of goodwill	0	0	247	779	–	–	247	779
Impairment of intangible assets	425	633	0	344	–	–	425	977
Equity compensation plan expenses	559	464	102	92	52	41	713	597

Pharmaceuticals subdivisional information in millions of CHF

	Roche Pharmaceuticals 2020	Roche Pharmaceuticals 2019	Chugai 2020	Chugai 2019	Pharmaceuticals Division 2020	Pharmaceuticals Division 2019
Revenues from external customers						
Sales	40,767	44,373	3,765	4,143	44,532	48,516
Royalties and other operating income	1,860	2,069	99	129	1,959	2,198
Total	**42,627**	**46,442**	**3,864**	**4,272**	**46,491**	**50,714**
Revenues from other operating segments						
Sales	1,660	1,646	1,804	1,224	3,464	2,870
Royalties and other operating income	47	65	1,267	756	1,314	821
Elimination of income within division					(4,778)	(3,691)
Total	**1,707**	**1,711**	**3,071**	**1,980**	**–**	**–**
Segment results						
Operating profit	14,765	16,264	2,654	1,940	17,419	18,204
Elimination of results within division					(267)	(258)
Operating profit	**14,765**	**16,264**	**2,654**	**1,940**	**17,152**	**17,946**
Capital expenditure						
Business combinations	0	4,872	0	0	0	4,872
Asset acquisitions	914	0	0	0	914	0
Additions to property, plant and equipment	1,479	1,372	662	492	2,141	1,864
Additions to right-of-use assets	275	190	69	74	344	264
Additions to intangible assets	2,988	1,320	14	38	3,002	1,358
Total	**5,656**	**7,754**	**745**	**604**	**6,401**	**8,358**
Research and development						
Research and development costs	10,515	10,327	1,047	973	11,562	11,300
Elimination of costs within division					(141)	(79)
Total	**10,515**	**10,327**	**1,047**	**973**	**11,421**	**11,221**
Other segment information						
Depreciation of property, plant and equipment	1,070	1,070	193	157	1,263	1,227
Depreciation of right-of-use assets	188	174	48	55	236	229
Amortisation of intangible assets	1,620	1,387	19	19	1,639	1,406
Impairment (reversal) of property, plant and equipment	(33)	235	3	11	(30)	246
Impairment (reversal) of right-of-use assets	2	(12)	0	0	2	(12)
Impairment of goodwill	0	0	0	0	0	0
Impairment of intangible assets	425	632	0	1	425	633
Equity compensation plan expenses	556	461	3	3	559	464

Net assets in millions of CHF

At 31 December	Assets 2020	Assets 2019	Assets 2018	Liabilities 2020	Liabilities 2019	Liabilities 2018	Net assets 2020	Net assets 2019	Net assets 2018
Net operating assets									
Pharmaceuticals	46,357	45,215	40,246	(12,886)	(14,426)	(12,559)	33,471	30,789	27,687
Diagnostics	18,751	18,287	18,898	(4,987)	(4,509)	(4,576)	13,764	13,778	14,322
Corporate	381	362	322	(567)	(607)	(580)	(186)	(245)	(258)
Total	**65,489**	**63,864**	**59,466**	**(18,440)**	**(19,542)**	**(17,715)**	**47,049**	**44,322**	**41,751**
Current income tax net assets (liabilities)							(3,530)	(3,601)	(3,600)
Deferred tax net assets (liabilities)							5,106	4,681	3,511
Defined benefit plan net assets (liabilities)							(6,864)	(6,535)	(6,140)
Lease liabilities							(1,195)	(1,219)	–
Marketable securities							6,607	5,783	6,437
Cash and cash equivalents							5,727	6,075	6,681
Debt							(14,216)	(14,363)	(18,770)
Other net assets (liabilities)							1,089	724	496
Total net assets							**39,773**	**35,867**	**30,366**

As disclosed in Note 6, the net operating assets for the Pharmaceuticals Division and the deferred tax net assets (liabilities) for the Group at 31 December 2019 have been restated following the finalisation of the valuation of the net assets acquired related to the Spark Therapeutics acquisition in 2019. A reconciliation to the previously published balance sheet is provided in Note 6.

Net operating assets – Pharmaceuticals subdivisional information in millions of CHF

At 31 December	Assets 2020	Assets 2019	Assets 2018	Liabilities 2020	Liabilities 2019	Liabilities 2018	Net assets 2020	Net assets 2019	Net assets 2018
Roche Pharmaceuticals	42,387	41,333	36,421	(13,224)	(14,462)	(12,524)	29,163	26,871	23,897
Chugai	6,923	6,098	5,627	(1,325)	(1,133)	(1,042)	5,598	4,965	4,585
Elimination within division	(2,953)	(2,216)	(1,802)	1,663	1,169	1,007	(1,290)	(1,047)	(795)
Pharmaceuticals Division	**46,357**	**45,215**	**40,246**	**(12,886)**	**(14,426)**	**(12,559)**	**33,471**	**30,789**	**27,687**

As disclosed in Note 6, the net operating assets of Roche Pharmaceuticals at 31 December 2019 have been restated following the finalisation of the valuation of the net assets acquired related to the Spark Therapeutics acquisition in 2019. A reconciliation to the previously published balance sheet is provided in Note 6.

Information by geographical area in millions of CHF

	Revenues from external customers				Non-current assets
	Sales	Royalties and other operating income	Property, plant and equipment	Right-of-use assets	Goodwill and intangible assets
2020					
Switzerland	670	431	6,125	125	3,030
Germany	3,323	29	4,012	40	916
Rest of Europe	9,780	5	990	220	919
Europe	**13,773**	**465**	**11,127**	**385**	**4,865**
United States	27,187	1,443	6,496	422	16,173
Rest of North America	882	1	74	20	19
North America	**28,069**	**1,444**	**6,570**	**442**	**16,192**
Latin America	2,393	0	268	42	0
Japan	4,156	98	2,587	92	190
Rest of Asia	8,614	13	1,520	110	19
Asia	**12,770**	**111**	**4,107**	**202**	**209**
Africa, Australia and Oceania	1,318	0	86	41	0
Total	**58,323**	**2,020**	**22,158**	**1,112**	**21,266**
2019					
Switzerland	590	647	5,909	144	1,731
Germany	3,050	34	3,918	43	957
Rest of Europe	9,654	18	972	179	423
Europe	**13,294**	**699**	**10,799**	**366**	**3,111**
United States	29,724	1,440	6,819	416	17,703
Rest of North America	985	1	108	25	21
North America	**30,709**	**1,441**	**6,927**	**441**	**17,724**
Latin America	2,858	0	315	43	7
Japan	4,545	129	2,405	104	203
Rest of Asia	8,701	16	1,627	147	0
Asia	**13,246**	**145**	**4,032**	**251**	**203**
Africa, Australia and Oceania	1,359	0	100	44	1
Total	**61,466**	**2,285**	**22,173**	**1,145**	**21,046**

Sales are allocated to geographical areas by destination according to the location of the customer. Royalties and other operating income are allocated according to the location of the Group company that receives the revenue.

As disclosed in Note 28, the Group changed its accounting policies for leases following the implementation of IFRS 16 'Leases', effective 1 January 2019. The Group applied the cumulative catch-up method for the transition, meaning that the comparative balance sheet as at 31 December 2018 was not restated. Details of the additional segment net operating assets reported, which total to CHF 1,186 million, are given below.

Transition impact of IFRS 16 on segment net operating assets in millions of CHF

	Assets	Liabilities	1 January 2019 Net assets
Roche Pharmaceuticals	647	53	700
Chugai	127	1	128
Pharmaceuticals Division	**774**	**54**	**828**
Diagnostics Division	319	(3)	316
Corporate	42	0	42
Total operating	**1,135**	**51**	**1,186**
Lease liabilities	–	(1,190)	(1,190)
Group	**1,135**	**(1,139)**	**(4)**

Major customers

In total three US national wholesale distributors represent approximately a third of the Group's revenues in 2020. The three US national wholesale distributors are McKesson Corp. with CHF 9 billion (2019: CHF 10 billion), AmerisourceBergen Corp. with CHF 7 billion (2019: CHF 8 billion) and Cardinal Health, Inc. with CHF 5 billion (2019: CHF 6 billion). Approximately 96% of these revenues were in the Roche Pharmaceuticals operating segment, with the residual in the Diagnostics operating segment.

3. Revenue

Disaggregated revenue information

Disaggregation of revenue in millions of CHF

	2020			2019		
	Revenue from contracts with customers	Revenue from other sources	Total	Revenue from contracts with customers	Revenue from other sources	Total
Pharmaceuticals Division						
Sales by therapeutic area						
Oncology	23,323	–	23,323	27,571	–	27,571
Immunology	8,228	–	8,228	8,514	–	8,514
Neuroscience	4,937	–	4,937	4,358	–	4,358
Haemophilia A	2,190	–	2,190	1,380	–	1,380
Ophthalmology	1,444	–	1,444	1,826	–	1,826
Infectious diseases	861	–	861	1,089	–	1,089
Other therapeutic areas	3,549	–	3,549	3,778	–	3,778
Sales	**44,532**	**–**	**44,532**	**48,516**	**–**	**48,516**
Royalty income	1,012	–	1,012	1,039	–	1,039
Income from out-licensing agreements	163	–	163	198	–	198
Income from disposal of products and other	244	540	784	504	457	961
Royalties and other operating income	**1,419**	**540**	**1,959**	**1,741**	**457**	**2,198**
Diagnostics Division						
Sales by business area						
Centralised and Point of Care Solutions	6,630	643	7,273	7,176	643	7,819
Molecular Diagnostics	3,643	117	3,760	1,998	111	2,109
Diabetes Care	1,666	4	1,670	1,915	3	1,918
Tissue Diagnostics	1,011	77	1,088	1,053	51	1,104
Sales	**12,950**	**841**	**13,791**	**12,142**	**808**	**12,950**
Royalty income	35	–	35	65	–	65
Income from out-licensing agreements	8	–	8	0	–	0
Income from disposal of products and other	0	18	18	0	22	22
Royalties and other operating income	**43**	**18**	**61**	**65**	**22**	**87**
Total	**58,944**	**1,399**	**60,343**	**62,464**	**1,287**	**63,751**

Revenue from other sources primarily relates to lease revenue and collaboration income for which the counterparty is not considered a customer, such as income from profit-sharing arrangements.

Gross-to-net sales reconciliation for the Pharmaceuticals Division

The gross-to-net sales reconciliation for the Pharmaceuticals Division is shown in the table below. The companies in the Diagnostics Division have similar reconciling items, but at much lower amounts.

Pharmaceuticals Division sales gross-to-net reconciliation in millions of CHF

	2020	2019
Gross sales	55,105	59,209
Government and regulatory mandatory price reductions	(6,159)	(6,640)
Contractual price reductions	(3,478)	(3,046)
Cash discounts	(304)	(353)
Customer returns reserves	(266)	(283)
Others	(366)	(371)
Net sales	**44,532**	**48,516**

Government and regulatory mandatory price reductions. These consist of mandatory price reductions. The major elements are the 340B Drug Discount Program, Medicaid, and other plans in the US, which totalled USD 5.5 billion, equivalent to CHF 5.2 billion (2019: USD 5.7 billion, equivalent to CHF 5.7 billion).

Contractual price reductions. These include rebates and chargebacks that are the result of contractual agreements that are primarily volume based and performance based.

Cash discounts. These include credits offered to wholesalers for remitting payment on their purchases within contractually defined incentive periods.

Customer returns reserves. These are allowances established for expected product returns.

Sales reductions that are expected to be withheld by the customer upon settlement, such as contractual price reductions and cash discounts, are recorded in the balance sheet as a deduction from trade receivables (see Note 12). Sales reductions that are separately payable to customers, governmental health authorities or healthcare regulatory authorities are recorded in the balance sheet as accrued liabilities (see Note 19). Provisions for sales returns are recorded in the balance sheet as other provisions (see Note 20).

Contract balances

Receivables in millions of CHF

	2020	2019	2018
Accounts receivable [12]	10,154	10,440	9,776
Other current receivables – contracts with customers [16]	492	541	604
Other non-current receivables – contracts with customers [15]	37	38	25
Total receivables	**10,683**	**11,019**	**10,405**

Other current receivables mainly include royalty and licensing receivables. At 31 December 2020 total receivables include lease receivables of 2% (2019: 2%) which are not considered receivables from contracts with customers.

Contract assets in millions of CHF

	2020	2019	2018
Accrued income	144	114	73
Total contract assets	**144**	**114**	**73**

Contract liabilities in millions of CHF

	2020	2019	2018
Deferred income – non-current	146	162	21
Deferred income – current	439	487	290
Total contract liabilities	**585**	**649**	**311**

Movement in contract liabilities in millions of CHF

	2020	2019
At 1 January	649	311
Business combinations	0	142
Revenue recognised that was included in the contract liability balance at the beginning of the year	(567)	(332)
Increases due to cash received or receivable, excluding amounts recognised as revenue during the year	538	540
Currency translation effects	(35)	(12)
At 31 December	**585**	**649**

Revenue recognised in relation to performance obligations satisfied in previous years

In 2020 there was an increase in revenue recognised of CHF 94 million (2019: increase of CHF 199 million) relating to performance obligations that were satisfied in previous periods, mainly due to adjustments of sales deduction provisions and accruals for expected sales returns, chargebacks and other allowances in respect of previous years.

Remaining performance obligations in (partially) unsatisfied long-term contracts

Remaining performance obligations in (partially) unsatisfied long-term contracts are either included in deferred income or are related to amounts the Group expects to receive for goods and services that have not yet been transferred to customers under existing, non-cancellable or otherwise enforceable contracts. These are mainly associated with contracts in the Diagnostics Division that have minimum purchase commitments related to reagents and consumables for previously sold instruments as well as monitoring and maintenance services. For contracts that have an original duration of one year or less, the Group has elected the practical expedient to not disclose the transaction price for remaining performance obligations at the end of each reporting period and at which point in time the Group expects to recognise these sales.

Transaction price allocated to contracts with (partially) unsatisfied performance obligations in millions of CHF

	2020	2019
No contract liability held	2,519	2,451
Contract liability held	585	649
Total	**3,104**	**3,100**
Thereof expected to be recognised as revenue		
– Within one year	1,497	1,534
– Between one and five years	1,529	1,468
– More than five years	78	98
Total	**3,104**	**3,100**

4. Net financial expense

Financing costs in millions of CHF

	2020	2019
Interest expense	(411)	(590)
Amortisation of debt discount [21]	(9)	(12)
Net gains (losses) on redemption and repurchase of bonds and notes	0	(202)
Discount unwind [20]	(14)	(31)
Net interest cost of defined benefit plans [26]	(101)	(140)
Interest expense on lease liabilities [28]	(18)	(18)
Total financing costs	**(553)**	**(993)**

Other financial income (expense) in millions of CHF

	2020	2019
Net gains (losses) on equity investments / securities at fair value through profit or loss	170	184
Dividend income from equity investments / securities at fair value through profit or loss	0	0
Dividend income from equity investments / securities at fair value through OCI	0	1
Net income from equity investments / securities	**170**	**185**
Interest income from debt securities at fair value through OCI and at amortised cost	16	99
Net gains (losses) on sale of debt securities at fair value through OCI	1	5
Net interest income and income from debt securities	**17**	**104**
Net foreign exchange gains (losses)	(624)	(193)
Net gains (losses) on foreign currency derivatives	418	(12)
Foreign exchange gains (losses)	**(206)**	**(205)**
Gains (losses) on net monetary position in hyperinflationary economies	(14)	(17)
Net other financial income (expense)	9	7
Associates	(1)	(15)
Total other financial income (expense)	**(25)**	**59**

Net financial expense in millions of CHF

	2020	2019
Financing costs	(553)	(993)
Other financial income (expense)	(25)	59
Net financial expense	**(578)**	**(934)**
Financial result from Treasury management	(476)	(779)
Financial result from Pension management	(101)	(140)
Associates	(1)	(15)
Net financial expense	**(578)**	**(934)**

Hyperinflationary economies

Since 1 July 2018 the Group has considered Argentina to be a hyperinflationary economy, in the context of IAS 29 'Financial Reporting in Hyperinflationary Economies'. The cumulative inflation index over the last three years exceeds 100%, as measured by the National Wholesaler Price Index (Sistema de Índices de Precios Mayoristas).

Accordingly the Group has reviewed the reporting from its affiliates in Argentina, and where necessary restated them in line with IAS 29. The potential adjustments resulting from the application of IAS 29 do not have a significant impact on the Group's operating results and balance sheet. An adjustment is recorded for the gains (losses) on the net monetary position, which is a loss of CHF 14 million resulting from the loss in purchasing power of the positive net monetary position during 2020 of the Group's Argentinian affiliates (2019: loss of CHF 17 million).

5. Income taxes

Income tax expenses in millions of CHF

	2020	2019
Current income taxes	(3,507)	(3,685)
Deferred taxes	610	1,179
Total income tax (expense)	**(2,897)**	**(2,506)**

Since the Group operates internationally, it is subject to income taxes in many different tax jurisdictions. The Group calculates its average expected tax rate as a weighted average of the tax rates in the tax jurisdictions in which the Group operates. This rate changes from year to year due to changes in the mix of the Group's taxable income and changes in local tax rates.

The Group's average expected tax rate was stable at 18.8% in 2020 (2019: 18.9%). During 2020 there were no significant changes to local tax rates in the tax jurisdictions in which the Group operates.

The Group's effective tax rate increased to 16.1% in 2020 (2019: 15.1%). This was mainly due to the lower effect from the resolution of several tax disputes in 2020 compared to 2019. The transitional effect in 2019 of the Swiss tax reform and the impairments of goodwill that are not tax deductible also impacted the effective tax rate.

The Group's effective tax rate can be reconciled to the Group's average expected tax rate as follows:

Reconciliation of the Group's effective tax rate

	2020	2019
Average expected tax rate	18.8%	18.9%
Tax effect of		
– Non-taxable income/non-deductible expenses	+0.8%	+0.5%
– Equity compensation plans	0.0%	–0.6%
– Research and development tax credits and other deductions	–2.1%	–2.4%
– US state tax impacts	+0.5%	+0.4%
– Tax on unremitted earnings	+0.6%	+1.9%
– Transitional effect of Swiss tax reform	–	–1.4%
– Resolution of several tax disputes	–1.8%	–2.7%
– Prior year and other differences	–0.7%	+0.5%
Group's effective tax rate	**16.1%**	**15.1%**

The income tax benefit recorded in respect of equity compensation plans, which varies according to the price of the underlying equity, was CHF 132 million (2019: CHF 193 million). Had the income tax benefits been recorded solely on the basis of the IFRS 2 expense multiplied by the applicable tax rate, then a benefit of approximately CHF 124 million (2019: CHF 99 million) would have been recorded.

Tax effects of other comprehensive income in millions of CHF

	2020			2019		
	Pre-tax amount	Tax	After-tax amount	Pre-tax amount	Tax	After-tax amount
Remeasurements of defined benefit plans	(315)	128	(187)	(516)	102	(414)
Equity investments at fair value through OCI	113	(14)	99	(5)	2	(3)
Debt securities at fair value through OCI	7	0	7	12	0	12
Cash flow hedges	(54)	15	(39)	(52)	13	(39)
Currency translation of foreign operations	(1,657)	–	(1,657)	(442)	–	(442)
Other comprehensive income	**(1,906)**	**129**	**(1,777)**	**(1,003)**	**117**	**(886)**

Income tax assets (liabilities) in millions of CHF

	2020	2019	2018
Current income taxes			
– Assets	149	237	208
– Liabilities	(3,679)	(3,838)	(3,808)
Net current income tax assets (liabilities)	**(3,530)**	**(3,601)**	**(3,600)**
Deferred taxes			
– Assets	5,459	4,979	3,895
– Liabilities	(353)	(298)	(384)
Net deferred tax assets (liabilities)	**5,106**	**4,681**	**3,511**

As disclosed in Note 6, the deferred tax assets at 31 December 2019 have been restated following the finalisation of the valuation of the net assets acquired related to the Spark Therapeutics acquisition in 2019. A reconciliation to the previously published deferred tax assets is provided in Note 6.

Current income tax liabilities include accruals for uncertain tax positions.

Current income taxes: movements in recognised net assets (liabilities) in millions of CHF

	2020	2019
Net current income tax asset (liability) at 1 January	(3,601)	(3,600)
Income taxes paid	3,236	3,543
Business combinations	0	0
(Charged) credited to the income statement	(3,507)	(3,685)
(Charged) credited to equity from equity compensation plans and other transactions with shareholders	103	96
Currency translation effects and other movements	239	45
Net current income tax asset (liability) at 31 December	**(3,530)**	**(3,601)**

Deferred taxes: movements in recognised net assets (liabilities) in millions of CHF

	Property, plant and equipment and right-of-use assets	Intangible assets	Defined benefit plans	Other temporary differences	Total
Year ended 31 December 2019					
At 1 January 2019	(954)	(590)	1,101	3,954	3,511
Business combinations [6]	0	(533)	0	299	(234)
Asset acquisitions	0	0	0	0	0
(Charged) credited to the income statement	91	363	(36)	761	1,179
(Charged) credited to other comprehensive income [22]	–	–	102	15	117
(Charged) credited to equity from equity compensation plans and other transactions with shareholders	–	–	–	208	208
Currency translation effects and other movements	9	6	(31)	(84)	(100)
At 31 December 2019	**(854)**	**(754)**	**1,136**	**5,153**	**4,681**
Year ended 31 December 2020					
At 1 January 2020	(854)	(754)	1,136	5,153	4,681
Business combinations	0	0	0	0	0
Asset acquisitions [6]	0	0	0	40	40
(Charged) credited to the income statement	(4)	442	23	149	610
(Charged) credited to other comprehensive income [22]	–	–	128	1	129
(Charged) credited to equity from equity compensation plans and other transactions with shareholders	–	–	–	(45)	(45)
Currency translation effects and other movements	42	54	(22)	(383)	(309)
At 31 December 2020	**(816)**	**(258)**	**1,265**	**4,915**	**5,106**

As disclosed in Note 6, the net deferred tax assets (liabilities) at 31 December 2019 have been restated following the finalisation of the valuation of the net assets acquired related to the Spark Therapeutics acquisition in 2019. A reconciliation to the previously published net deferred tax assets (liabilities) is provided in Note 6.

The deferred tax net assets for other temporary differences mainly relate to accrued and other liabilities, including lease liabilities, provisions and unrealised profit in inventory.

Deferred tax assets are recognised for tax losses carried forward only to the extent that realisation of the related tax benefit is probable. The Group has unrecognised tax losses, including valuation allowances, as follows:

Unrecognised tax losses: expiry

	Amount (CHF m)	2020 Applicable tax rate	Amount (CHF m)	2019 Applicable tax rate
Within one year	1,871	12%	1,654	12%
Between one and five years	1,350	12%	1,227	12%
More than five years	7,802	7%	14,763	6%
Total unrecognised tax losses	**11,023**	**9%**	**17,644**	**7%**

The 'More than five years' category includes losses that cannot be used for US state income tax purposes in those states which only permit tax reporting on a separate entity basis.

Deferred tax liabilities have not been established for the withholding tax and other taxes that would be payable on the remittance of earnings of foreign subsidiaries, where such amounts are currently regarded as permanently reinvested for the purpose of these financial statements. The total unremitted earnings of the Group, regarded as permanently reinvested for the purpose of these financial statements, were CHF 40.6 billion at 31 December 2020 (2019: CHF 38.1 billion).

6. Mergers and acquisitions

This note includes both transactions accounted for as business combinations and asset acquisitions. Asset acquisitions are acquisitions of legal entities that do not qualify as business combinations under IFRS 3 and include those acquisitions where the value in these acquired companies largely consists of the rights to a single product or technology. Cash consideration paid for asset acquisitions at the transaction date and subsequent additional contingent payments made upon the achievement of performance-related development milestones are presented in the line 'Asset acquisitions' as disclosed separately below. Subsequent consideration for performance-related development milestones for transactions treated as asset acquisitions is recognised as intangible assets when the specific milestones have been achieved.

Business combinations – 2020

The Group did not complete any business combinations in 2020.

Business combinations – 2019

Spark Therapeutics, Inc. On 17 December 2019 the Group acquired a 100% controlling interest in Spark Therapeutics, Inc. ('Spark Therapeutics'), a publicly owned US company based in Philadelphia, Pennsylvania, that had been listed on Nasdaq. Spark Therapeutics is a fully integrated commercial company committed to discovering, developing and delivering gene therapies. Spark Therapeutics is reported in the Pharmaceuticals Division as part of the Roche Pharmaceuticals operating segment. The total consideration was USD 4,772 million, which was paid in cash.

In the 2019 Annual Financial Statements the accounting for the Spark Therapeutics acquisition was provisional based on preliminary information because the transaction closed shortly before 31 December 2019. The identification and valuation of intangible assets, other assets and liabilities were finalised in 2020. The identifiable assets acquired and liabilities assumed are set out in the table below.

Business combinations – 2019: net assets acquired in millions of CHF

	Spark Therapeutics
Property, plant and equipment [8]	77
Right-of-use assets [28]	65
Intangible assets	
– Product intangibles: in use [10]	457
– Product intangibles: not available for use [10]	1,967
Deferred tax assets [5]	299
Cash and cash equivalents	157
Marketable securities	133
Deferred tax liabilities [5]	(533)
Other non-current liabilities	
– Deferred income	(133)
– Lease liabilities	(77)
– Other long-term liabilities	(2)
Other net assets (liabilities)	(28)
Net identifiable assets	**2,382**
Goodwill [9]	2,306
Total consideration	**4,688**
Cash	4,688
Total consideration	**4,688**

Intangible assets include Spark Therapeutics' lead clinical asset SPK-8011, a novel gene therapy for the treatment of haemophilia A, and Luxturna, Spark Therapeutics' marketed gene therapy for the treatment of patients with confirmed biallelic RPE65 mutation-associated retinal dystrophy (an inherited retinal disease). Luxturna was the first gene therapy to receive an FDA approval in 2017. The European Commission granted marketing authorisation for Luxturna in 2018. Intangible assets also include Spark Therapeutics' other clinical and pre-clinical assets. The fair value of the intangible assets was determined using an excess earning method that is based on management forecasts and observable market data for discount rates, tax rates and foreign exchange rates. The present value was calculated using a risk-adjusted discount rate of 10.0%. The valuation was performed by an independent valuer.

Goodwill represents Spark Therapeutics' technological capabilities in gene therapy, such as gene therapy manufacturing, adeno-associated viral vector engineering and immunology. Furthermore, goodwill represents a control premium, the acquired work force and the expected synergies, notably in the areas of research and development as well as commercialisation of gene therapies. None of the goodwill is expected to be deductible for income tax purposes.

The Spark Therapeutics accounts receivable was comprised of gross contractual amounts due of CHF 12 million which were all expected to be collectable at the date of the acquisition.

Directly attributable transaction costs of CHF 25 million were reported in the Roche Pharmaceuticals operating segment within general and administration expenses.

The impact of the acquisition on the 2019 results for the Pharmaceuticals Division and the Group were not material. If the acquisition had occurred on 1 January 2019 management estimates that Spark Therapeutics would have contributed revenue of approximately CHF 80 million and a net loss (after tax) of approximately CHF 450 million in 2019. This information is provided for illustrative purposes only and is not necessarily indicative of the results of the combined Group that would have occurred had Spark Therapeutics actually been acquired at the beginning of the year, or indicative of the future results of the combined Group.

Cash flows from business combinations

Business combinations: net cash outflow in millions of CHF

	2020			2019		
	Pharmaceuticals	Diagnostics	Total	Pharmaceuticals	Diagnostics	Total
Cash consideration paid	0	0	0	(4,688)	0	(4,688)
Deferred consideration paid	0	(2)	(2)	0	(3)	(3)
Contingent consideration paid [20]	(9)	0	(9)	(30)	(142)	(172)
Cash in acquired company	0	0	0	157	0	157
Total net cash outflow	**(9)**	**(2)**	**(11)**	**(4,561)**	**(145)**	**(4,706)**

Asset acquisitions – 2020

Promedior, Inc. On 13 February 2020 the Group acquired a 100% controlling interest in Promedior, Inc. ('Promedior'), a privately owned US company based in Lexington, Massachusetts. With the acquisition, the Group obtained rights to Promedior's entire portfolio including phase III-ready asset PRM-151, a recombinant human pentraxin-2 molecule for the treatment of idiopathic pulmonary fibrosis. Promedior is reported in the Pharmaceuticals Division. The cash consideration paid at the acquisition date was USD 414 million. Additional contingent payments may be made based upon the achievement of performance-related milestones.

Stratos Genomics, Inc. On 20 May 2020 the Group acquired a 100% controlling interest in Stratos Genomics, Inc. ('Stratos Genomics'), a privately owned US company based in Seattle, Washington. Stratos Genomics is an early-stage sequencing technology company, which the Group acquired to advance the development of the Group's nanopore sequencer. The acquisition provides the Group access to Stratos Genomics' unique chemistry, Sequencing by Expansion. Stratos Genomics is reported in the Diagnostics Division. The cash consideration paid at the acquisition date was USD 250 million. Additional contingent payments may be made based upon the achievement of performance-related milestones.

Lexent Bio, Inc. On 12 June 2020 the Group acquired a 100% controlling interest in Lexent Bio, Inc. ('Lexent Bio'), a privately owned US company based in San Francisco and San Diego, California. The acquisition provides the Group access to Lexent Bio's novel multiomics liquid biopsy platforms. Lexent Bio is reported in the Pharmaceuticals Division. The cash consideration paid at the acquisition date was USD 30 million. An additional contingent payment may be made based upon the achievement of a performance-related milestone.

Inflazome Ltd. On 18 September 2020 the Group acquired a 100% controlling interest in Inflazome Ltd. ('Inflazome'), a privately owned company based in Dublin, Ireland. With the acquisition, the Group obtained rights to Inflazome's portfolio of clinical and preclinical orally available small molecule NLRP3 inhibitors. Inflazome is reported in the Pharmaceuticals Division. The cash consideration paid at the acquisition date was EUR 376 million. Additional contingent payments may be made based upon the achievement of performance-related milestones.

TMEM16A Ltd. On 6 October 2020 the Group acquired a 100% controlling interest in TMEM16A Ltd. ('TMEM16A'), a privately owned company based in Brighton, United Kingdom. TMEM16A had been spun off from Enterprise Therapeutics Ltd immediately before the transaction. With the acquisition, the Group gained access to a portfolio of TMEM16A potentiators, including a lead compound in phase I clinical trials. TMEM16A is reported in the Pharmaceuticals Division. The cash consideration paid at the acquisition date was GBP 76 million. Additional contingent payments may be made based upon the achievement of performance-related milestones.

For asset acquisitions previously closed the Group recorded additions to product intangible assets related to the achievement of performance-related milestones of CHF 88 million (2019: nil), of which CHF 22 million were paid in 2020 (2019: nil).

Asset acquisitions – 2020: net assets acquired in millions of CHF

	Promedior	Stratos Genomics	Lexent Bio	Inflazome	TMEM16A	Total
Intangible assets						
– Product intangibles: not available for use	360	255	25	413	93	1,146
Deferred tax assets [5]	25	12	3	0	0	40
Cash and cash equivalents	18	6	0	4	1	29
Other net assets (liabilities)	2	0	0	(12)	0	(10)
Net identifiable assets	**405**	**273**	**28**	**405**	**94**	**1,205**
Fair value of previously held equity interest	–	(25)	–	–	–	(25)
Total consideration	**405**	**248**	**28**	**405**	**94**	**1,180**
Cash	405	243	28	405	94	1,175
Deferred consideration	–	5	–	–	–	5
Total cash consideration	**405**	**248**	**28**	**405**	**94**	**1,180**

Asset acquisitions – 2019

The Group did not complete any asset acquisitions in 2019.

Cash flows from asset acquisitions

Asset acquisitions: net cash outflow in millions of CHF

	Pharmaceuticals	Diagnostics	2020 Total	Pharmaceuticals	Diagnostics	2019 Total
Cash consideration paid	(932)	(243)	(1,175)	0	0	0
Cash in acquired company	23	6	29	0	0	0
Contingent payments related to previous acquisitions	(22)	0	(22)	0	0	0
Total net cash outflow	**(931)**	**(237)**	**(1,168)**	**0**	**0**	**0**

Restated balance sheet – 31 December 2019

In the 2019 Annual Financial Statements the accounting for the Spark Therapeutics acquisition was provisional based on preliminary information because the transaction closed shortly before 31 December 2019. The identification and valuation of intangible assets, other assets and liabilities were finalised in 2020 and as a result the comparative balance sheet information at 31 December 2019 has been restated. The reconciliation between the balance sheet and the net assets acquired published previously for 2019 (using provisional acquisition accounting) and the restated amounts which are reported as comparatives in 2019 (using final acquisition accounting), as required by IFRS 3 'Business Combinations', are presented below.

Restated Roche Group consolidated balance sheet (selected items) in millions of CHF

			31 December 2019
	As originally published	Measurement adjustment	Restated
Goodwill	12,456	(2,161)	10,295
Intangible assets	8,358	2,393	10,751
Deferred tax assets	5,211	(232)	4,979
Other net assets	9,842	0	9,842
Net assets	**35,867**	**0**	**35,867**

The measurement adjustments in the table above are at the closing exchange rate on 31 December 2019.

Restated Spark Therapeutics acquisition – 2019: net assets acquired (selected items) in millions of CHF

			Spark Therapeutics
	As originally published	Measurement adjustment	Restated
Intangible assets			
– Product intangibles: in use	0	457	457
– Product intangibles: not available for use	0	1,967	1,967
Deferred tax assets	0	299	299
Deferred tax liabilities	0	(533)	(533)
Other net assets (liabilities)	192	0	192
Net identifiable assets	**192**	**2,190**	**2,382**
Goodwill	4,496	(2,190)	2,306
Total consideration	**4,688**	**0**	**4,688**

The measurement adjustments in the table above are at the exchange rate on the date of control for the Spark Therapeutics acquisition (17 December 2019).

7. Global restructuring plans

During 2020 the Group continued with the implementation of various global restructuring plans initiated in prior years.

Global restructuring plans: costs incurred in millions of CHF

	Diagnostics	Site consolidation	Other plans	Total
Year ended 31 December 2020				
Global restructuring costs				
– Employee-related costs	83	143	427	653
– Site closure costs	46	(34)	44	56
– Divestment of products and businesses	(3)	0	0	(3)
– Other reorganisation expenses	56	20	127	203
Total global restructuring costs	**182**	**129**	**598**	**909**
Additional costs				
– Impairment of goodwill	0	0	0	0
– Impairment of intangible assets	0	0	0	0
– Legal and environmental cases	0	0	0	0
Total costs	**182**	**129**	**598**	**909**
Year ended 31 December 2019				
Global restructuring costs				
– Employee-related costs	176	171	526	873
– Site closure costs	38	69	28	135
– Divestment of products and businesses	(16)	1	0	(15)
– Other reorganisation expenses	143	15	55	213
Total global restructuring costs	**341**	**256**	**609**	**1,206**
Additional costs				
– Impairment of goodwill	0	0	0	0
– Impairment of intangible assets	0	0	0	0
– Legal and environmental cases	(1)	43	0	42
Total costs	**340**	**299**	**609**	**1,248**

Diagnostics Division

In 2020 strategy plans in the Diagnostics Division incurred costs of CHF 100 million, mainly for employee-related costs.

Site consolidation

In 2020 employee-related costs were mainly for the optimisation of enabling functions within the drug product network. Other site closure costs included an impairment reversal of CHF 42 million.

Other global restructuring plans

In 2020 major items included employee-related costs of CHF 427 million, mainly for the outsourcing of operational activities to the global shared service centres and external providers as well as for driving business transformation and efficiency gains.

Global restructuring plans: summary of costs incurred in millions of CHF

	2020	2019
Employee-related costs		
– Termination costs	517	724
– Defined benefit plans	0	10
– Other employee-related costs	136	139
Total employee-related costs	**653**	**873**
Site closure costs		
– Impairment (reversal) of property, plant and equipment and right-of-use assets	(35)	(4)
– Accelerated depreciation of property, plant and equipment and right-of-use assets	77	73
– (Gains) losses on disposal of property, plant and equipment and right-of-use assets	3	14
– Other site closure costs	11	52
Total site closure costs	**56**	**135**
Divestment of products and businesses		
– (Gains) losses on divestment of subsidiaries	(3)	(15)
– Other (gains) losses on divestment of products and businesses	0	0
Total costs on divestment of products and businesses	**(3)**	**(15)**
Other reorganisation expenses	203	213
Total global restructuring costs	**909**	**1,206**
Additional costs		
– Impairment of goodwill	0	0
– Impairment of intangible assets	0	0
– Legal and environmental cases	0	42
Total costs	**909**	**1,248**

Global restructuring plans: classification of costs in millions of CHF

	2020			2019		
	Depreciation, amortisation and impairment	Other costs	Total	Depreciation, amortisation and impairment	Other costs	Total
Cost of sales						
– Pharmaceuticals	(35)	157	122	41	219	260
– Diagnostics	33	70	103	9	111	120
Marketing and distribution						
– Pharmaceuticals	8	131	139	5	262	267
– Diagnostics	1	38	39	1	137	138
Research and development						
– Pharmaceuticals	31	44	75	18	123	141
– Diagnostics	1	23	24	6	72	78
General and administration						
– Pharmaceuticals	2	235	237	(12)	123	111
– Diagnostics	1	55	56	1	3	4
– Corporate	0	114	114	0	129	129
Total	**42**	**867**	**909**	**69**	**1,179**	**1,248**
Total by operating segment						
– Roche Pharmaceuticals	(33)	565	532	29	678	707
– Chugai	39	2	41	23	49	72
– Diagnostics	36	186	222	17	323	340
– Corporate	0	114	114	0	129	129
Total	**42**	**867**	**909**	**69**	**1,179**	**1,248**

8. Property, plant and equipment

Property, plant and equipment: movements in carrying value of assets in millions of CHF

	Land	Buildings and land improvements	Machinery and equipment	Construction in progress	Total
At 1 January 2019					
Cost	1,384	16,707	20,437	3,294	41,822
Accumulated depreciation and impairment	0	(6,694)	(13,303)	(7)	(20,004)
Net book value	**1,384**	**10,013**	**7,134**	**3,287**	**21,818**
Year ended 31 December 2019					
At 1 January 2019	1,384	10,013	7,134	3,287	21,818
Reclassification to right-of-use assets of previously reported finance leases on implementation of IFRS 16 'Leases' [28]	–	–	(3)	–	(3)
At 1 January 2019 (revised)	**1,384**	**10,013**	**7,131**	**3,287**	**21,815**
Business combinations [6]	0	43	18	16	77
Additions	57	114	1,079	2,229	3,479
Disposals	(1)	(13)	(87)	(5)	(106)
Transfers	0	831	1,031	(1,862)	–
Depreciation charge	–	(764)	(1,645)	–	(2,409)
Impairment reversal (charge)	0	(10)	(24)	(227)	(261)
Other	0	(10)	(62)	(4)	(76)
Currency translation effects	(14)	(144)	(141)	(47)	(346)
At 31 December 2019	**1,426**	**10,060**	**7,300**	**3,387**	**22,173**
Cost	1,426	17,353	21,189	3,604	43,572
Accumulated depreciation and impairment	0	(7,293)	(13,889)	(217)	(21,399)
Net book value	**1,426**	**10,060**	**7,300**	**3,387**	**22,173**
Year ended 31 December 2020					
At 1 January 2020	1,426	10,060	7,300	3,387	22,173
Asset acquisitions	0	0	1	0	1
Additions	0	111	1,047	2,535	3,693
Disposals	0	(11)	(82)	(5)	(98)
Transfers	1	827	1,109	(1,937)	–
Depreciation charge	–	(803)	(1,648)	–	(2,451)
Impairment reversal (charge)	0	0	35	(9)	26
Other	0	0	(229)	0	(229)
Currency translation effects	(77)	(424)	(345)	(111)	(957)
At 31 December 2020	**1,350**	**9,760**	**7,188**	**3,860**	**22,158**
Cost	1,350	17,456	21,127	4,052	43,985
Accumulated depreciation and impairment	0	(7,696)	(13,939)	(192)	(21,827)
Net book value	**1,350**	**9,760**	**7,188**	**3,860**	**22,158**

Classification of impairment of property, plant and equipment in millions of CHF

	2020	2019
Cost of sales	30	(250)
Marketing and distribution	0	0
Research and development	(1)	(6)
General and administration	(3)	(5)
Total impairment reversal (charge)	**26**	**(261)**

In 2020 impairment reversals for property, plant and equipment were mainly related to global restructuring plans (see Note 7). Impairments for property, plant and equipment recorded in 2019 were mainly for an idle plant.

In 2020 no reimbursements were received from insurance companies in respect of impairments to property, plant and equipment (2019: none). In 2020 no borrowing costs were capitalised as property, plant and equipment (2019: none).

At 31 December 2020 machinery and equipment with an original cost of CHF 5.5 billion (2019: CHF 5.5 billion) and a net book value of CHF 1.7 billion (2019: CHF 1.8 billion) was being leased to third parties (see Note 28).

Capital commitments

The Group has non-cancellable capital commitments for the purchase or construction of property, plant and equipment totalling CHF 2.1 billion (2019: CHF 2.3 billion).

9. Goodwill

Goodwill: movements in carrying value of assets in millions of CHF

	2020	2019
At 1 January		
Cost	14,782	12,836
Accumulated impairment	(4,487)	(3,888)
Net book value	**10,295**	**8,948**
Year ended 31 December		
At 1 January	10,295	8,948
Business combinations [6]	0	2,306
Impairment charge recorded within general and administration	(247)	(779)
Currency translation effects	(799)	(180)
At 31 December	**9,249**	**10,295**
Cost	13,390	14,782
Accumulated impairment	(4,141)	(4,487)
Net book value	**9,249**	**10,295**
Allocated to the following cash-generating units		
Roche Pharmaceuticals	5,148	5,641
Roche Pharmaceuticals product transactions	333	358
Chugai	94	98
Total Pharmaceuticals Division	**5,575**	**6,097**
Diagnostics customer areas	2,344	2,831
Diabetes Care customer area	93	93
Divisional goodwill	1,237	1,274
Total Diagnostics Division	**3,674**	**4,198**

As disclosed in Note 6, the goodwill at 31 December 2019 has been restated following the finalisation of the valuation of the net assets acquired related to the Spark Therapeutics acquisition in 2019. A reconciliation to the previously published goodwill is provided in Note 6.

Cash-generating units used for allocating goodwill

Pharmaceuticals Division. The basis for the use of the cash-generating units for allocating goodwill in the Pharmaceuticals Division is as follows:

- Within the Roche Pharmaceuticals operating segment, goodwill arises from three broad types of transactions:
  - Strategic transactions that have a transformative effect across the whole division.
  - Technology transactions, where the acquired technologies can have a range of areas of applications.
  - Product transactions, where the acquired products typically have more limited synergistic benefits outside of the immediate product therapeutic area.
- The cash-generating unit for the goodwill arising from strategic transactions is the Roche Pharmaceuticals operating segment.
- The cash-generating unit for the goodwill arising from technology transactions is also the Roche Pharmaceuticals operating segment. However, if the acquired technologies permanently cease to operate then this will be treated as a disposal of the business; in such cases the goodwill will be deemed to have been disposed of and will be fully impaired.
- The cash-generating unit for the goodwill arising from product transactions is the smallest identifiable group of assets related to the revenues and related costs that arise from the development and commercialisation of the product(s) in question. Where there are synergistic benefits to other products in the same therapeutic area, then the revenues, costs and corresponding assets of these other products are also taken into account. If the acquired products permanently cease to generate economic benefits then this will be treated as a disposal of the business; in such cases the goodwill will be deemed to have been disposed of and will be fully impaired.
- Chugai is a separate operating segment in the Group's financial reporting and a separate cash-generating unit to which goodwill is allocated.

The Group allocated the goodwill in the Roche Pharmaceuticals operating segment as listed below.
- Strategic transactions consist of Genentech (1990/1999), Foundation Medicine (2015), Flatiron Health (2018) and Spark Therapeutics (2019).
- Technology transactions consist of Therapeutic Human Polyclonals (2007), Dutalys (2014) and Santaris (2014).
- Product transactions consist of GlycArt (2005) and Tanox (2007).

Diagnostics Division. During 2020 the Group made a comprehensive reassessment of the cash-generating units used for allocating goodwill in the Diagnostics Division. This reassessment was made in light of the following factors:
- Business transformations within the Diagnostics Division during 2020, notably the organisation changes announced in the second half of 2020.
- Business development activities in the Diagnostics Information Solutions area.
- Ongoing reprioritisation of business activities in light of the COVID-19 pandemic and other developments in the wider diagnostics business.

The conclusions of this reassessment were as follows:
- Within the Diagnostics Division, goodwill arises from three broad types of transactions:
  - Strategic transactions that have a transformative effect across the whole division.
  - Technology transactions, where the acquired technologies can have a range of areas of applications.
  - Product transactions, where the acquired products either have synergistic benefits across the wider business or where they have more limited synergistic benefits outside of the immediate product therapeutic area.
- The cash-generating unit for the goodwill arising from strategic transactions will be the Diagnostics Division.
- The cash-generating unit for the goodwill arising from technology transactions will be either the Diagnostics customer areas or the Diabetes Care customer area. However, if the acquired technologies permanently cease to operate then this will be treated as a disposal of the business; in such cases the goodwill will be deemed to have been disposed of and will be fully impaired.
- The cash-generating unit for the goodwill arising from product transactions will be the smallest identifiable group of assets related to the revenues and related costs that arise from the development and commercialisation of the product(s) in question. Where there are synergistic benefits to other products in the same business, then the revenues, costs and corresponding assets of these other products will also be taken into account and the cash-generating unit will be either the Diagnostics customer areas or the Diabetes Care customer area. If the acquired products permanently cease to generate economic benefits then this will be treated as a disposal of the business; in such cases the goodwill will be deemed to have been disposed of and will be fully impaired.

Based on the above reassessment the Group allocated the remaining goodwill in the Roche Diagnostics operating segment as listed below. The basis for the reallocation were the historical amounts of goodwill that arose from the individual transactions.
- Strategic transactions consist of Corange/Boehringer Mannheim (1997).
- Technology transactions consist of Viewics (2017) in the Diagnostics customer areas and mySugr (2017) in the Diabetes Care customer area.
- Product transactions in the Diagnostics customer areas consist of AVL Medical Instruments (2000), Igen (2004), BioVeris (2007), Ventana (2008), PVT (2011), IQuum (2014) and GeneWeave Biosciences (2015).
- Product transactions in the Diabetes Care customer area consist of Disetronic (2003) and Medingo (2010).

Impairment charge – 2020

Diagnostics Division. The assessment for the potential impairment of goodwill in the Diagnostics Division was carried out using the cash generating units as set out above. During 2020 impairment charges totalling CHF 247 million were recorded in the Diagnostics Division.

AVL Medical Instruments acquisition. A charge of CHF 169 million was recorded for the full write-off of goodwill from the AVL Medical Instruments acquisition made in 2000. When acquired, AVL Medical Instruments was a leading supplier of blood gas and electrolyte analysers for point-of-care testing. The blood gas is currently loss-making and is expected to continue to be loss-making according to the latest business plans. The Diagnostics customer areas business is developing a replacement product and is planning substantial research and development investments in this area. The knowledge around the blood-gas business and the synergies gained from AVL Medical Instruments acquisition, reflected in the current goodwill amount, will only play a very minor incidental role in the future Diagnostics customer areas strategy and the development of the next-generation product. Accordingly the goodwill is deemed to have been disposed of and has been fully impaired. The intangible assets relating to this acquisition have been fully amortised in previous years.

GeneWeave Biosciences acquisition. A charge of CHF 78 million was recorded for the full write-off of goodwill from the GeneWeave Biosciences acquisition made in 2015. When acquired, GeneWeave Biosciences focused on advancing clinical microbiology with diagnostic solutions supporting healthcare providers in the fight against drug-resistant bacteria. At the acquisition date product intangible assets, not available for use, totalling CHF 412 million were recorded. Impairment charges were recorded in 2017 and 2019 to fully write off these intangible assets. The factors leading to these impairments were a decrease in forecasted cash flows following a change in the timelines for future product development, pricing and penetration rate due to updated market size assumptions, and further updated assumptions on timelines, research and development expenses and production costs. During 2020 the timelines have been further delayed, in part due to a reprioritisation of resources to COVID-19-related projects. It is currently unclear when and whether there will be any future revenues to support the carrying value of the goodwill, and any synergistic benefits to other products in the same business would be incidental. Accordingly the goodwill is deemed to have been disposed of and has been fully impaired.

Impairment charge – 2019

A charge of CHF 779 million was recorded in the Diagnostics Division for the partial write-off of goodwill related to the Diabetes Care business. The impairment was a result of revised market assumptions related to the blood glucose monitoring area and a slower than expected growth in other parts of this business.

Value in use

Value in use is calculated using a discounted expected cash flow approach, with a post-tax discount rate applied to the projected risk-adjusted post-tax cash flows and terminal value. The discount rate is the Group's weighted average cost of capital as the cash-generating units have integrated operations across large parts of the Group. It is derived from a capital asset pricing model using data from capital markets, including government twenty-year bonds. For assessing value in use, the cash flow projections are based on the most recent long-term forecasts approved by management. The long-term forecasts include management's latest estimates on sales volume and pricing, as well as production and other operating costs and assume no significant changes in the organisation. Other key assumptions used in the calculations are the period of cash flow projections included in the long-term forecasts, the terminal value growth rate and the discount rate.

Key assumptions used in value-in-use calculations

	2020			2019		
	Period of cash flow projections	Terminal value growth rate	Discount rate (after tax)	Period of cash flow projections	Terminal value growth rate	Discount rate (after tax)
Pharmaceuticals Division	5 years	n/a	6.5%	5 years	n/a	7.4%
Diagnostics Division	5 years	1.5%	6.5%	5 years	1.5%	7.4%

For cash-generating units with a terminal value growth, the respective rate does not exceed the long-term projected growth rate for the relevant market.

Fair value less costs of disposal

For goodwill arising from the Chugai acquisition, the fair value less costs of disposal is determined with reference to the publicly quoted price of Chugai shares.

Sensitivity analysis

Management has performed sensitivity analyses for Roche Pharmaceuticals and the Diagnostics Division, which increased the discount rate by 1% combined with decreasing the forecast cash flows by 5%, and for Chugai, which decreased the publicly quoted share prices by 5%. The results of the sensitivity analyses demonstrated that the above changes in the key assumptions would not cause the carrying values of goodwill to exceed the recoverable amounts at 31 December 2020.

10. Intangible assets

Intangible assets: movements in carrying value of assets in millions of CHF

	Product intangibles: in use	Product intangibles: not available for use	Other intangibles	Total
At 1 January 2019				
Cost	23,594	5,871	1,455	30,920
Accumulated amortisation and impairment	(18,414)	(2,095)	(1,065)	(21,574)
Net book value	**5,180**	**3,776**	**390**	**9,346**
Year ended 31 December 2019				
At 1 January 2019	5,180	3,776	390	9,346
Business combinations [6]	457	1,967	0	2,424
Asset acquisitions	0	0	0	0
Additions	598	661	357	1,616
Disposals	(2)	0	0	(2)
Transfers	2,098	(2,098)	0	–
Amortisation charge	(1,367)	–	(165)	(1,532)
Impairment charge	(351)	(625)	(1)	(977)
Currency translation effects	(90)	(25)	(9)	(124)
At 31 December 2019	**6,523**	**3,656**	**572**	**10,751**
Cost	26,009	6,338	1,783	34,130
Accumulated amortisation and impairment	(19,486)	(2,682)	(1,211)	(23,379)
Net book value	**6,523**	**3,656**	**572**	**10,751**
Allocated by operating segment				
Roche Pharmaceuticals	5,744	3,618	452	9,814
Chugai	15	35	55	105
Diagnostics	764	3	65	832
Total Group	**6,523**	**3,656**	**572**	**10,751**
Year ended 31 December 2020				
At 1 January 2020	6,523	3,656	572	10,751
Business combinations	0	0	0	0
Asset acquisitions	0	1,234	0	1,234
Additions	678	2,336	65	3,079
Disposals	0	0	0	0
Transfers	627	(627)	0	–
Amortisation charge	(1,603)	–	(147)	(1,750)
Impairment charge	(81)	(344)	0	(425)
Currency translation effects	(475)	(357)	(40)	(872)
At 31 December 2020	**5,669**	**5,898**	**450**	**12,017**
Cost	25,544	8,701	1,717	35,962
Accumulated amortisation and impairment	(19,875)	(2,803)	(1,267)	(23,945)
Net book value	**5,669**	**5,898**	**450**	**12,017**
Allocated by operating segment				
Roche Pharmaceuticals	4,984	5,562	322	10,868
Chugai	15	29	52	96
Diagnostics	670	307	76	1,053
Total Group	**5,669**	**5,898**	**450**	**12,017**

As disclosed in Note 6, intangible assets at 31 December 2019 have been restated following the finalisation of the valuation of the net assets acquired related to the Spark Therapeutics acquisition in 2019. A reconciliation to the previously published intangible assets is provided in Note 6. Marketing intangibles and technology intangibles, which were previously presented separately, have been aggregated into 'Other intangibles'. Comparative information was adjusted.

Significant intangible assets at 31 December 2020 in millions of CHF

	Operating segment	Net book value	Remaining amortisation period
Product intangibles in use			
Rozlytrek (Ignyta acquisition)	Roche Pharmaceuticals	1,361	11 years
Esbriet (InterMune acquisition)	Roche Pharmaceuticals	658	1 year
Xofluza (Shionogi licence transaction)	Roche Pharmaceuticals	465	15 years
Flatiron Health acquisition	Roche Pharmaceuticals	435	12 years
Gavreto (Blueprint Medicines licence transaction)	Roche Pharmaceuticals	414	16 years
Luxturna (Spark Therapeutics acquisition)	Roche Pharmaceuticals	287	8 years
Foundation Medicine acquisition	Roche Pharmaceuticals	204	4 years
Brahms licence transaction	Diagnostics	186	10 years
Kapa acquisition	Diagnostics	183	10 years
Product intangibles not available for use			
SPK-8011 haemophilia A gene therapy (Spark Therapeutics acquisition)	Roche Pharmaceuticals	985	n/a
Sarepta licence transaction	Roche Pharmaceuticals	815	n/a
Inflazome acquisition	Roche Pharmaceuticals	416	n/a
Promedior acquisition	Roche Pharmaceuticals	325	n/a
Atea licence transaction	Roche Pharmaceuticals	318	n/a
SPK-9001 haemophilia B gene therapy (Spark Therapeutics acquisition)	Roche Pharmaceuticals	309	n/a
Stratos Genomics acquisition	Diagnostics	297	n/a
Gavreto (Blueprint Medicines licence transaction)	Roche Pharmaceuticals	245	n/a
BioNTech licence transaction	Roche Pharmaceuticals	204	n/a
Dicerna licence transaction	Roche Pharmaceuticals	181	n/a
Other intangibles – Technology intangibles in use			
Adaptive licence transaction	Roche Pharmaceuticals	238	18 years

Classification of intangible asset amortisation and impairment expenses in millions of CHF

	Amortisation 2020	Amortisation 2019	Impairment 2020	Impairment 2019
Cost of sales				
– Pharmaceuticals	(1,210)	(1,153)	(81)	0
– Diagnostics	(94)	(111)	0	(344)
Marketing and distribution				
– Pharmaceuticals	(24)	(33)	0	(1)
– Diagnostics	(9)	(8)	0	0
Research and development				
– Pharmaceuticals	(405)	(220)	(344)	(632)
– Diagnostics	(8)	(7)	0	0
Total	**(1,750)**	**(1,532)**	**(425)**	**(977)**

Internally generated intangible assets

At 31 December 2020 commercial software intangible assets amounted to CHF 6 million (2019: nil) and are included in other intangibles. Other than that the Group has no internally generated intangible assets from development as the criteria for the recognition as an asset are not met.

Intangible assets with indefinite useful lives

The Group currently has no intangible assets with indefinite useful lives.

Intangible assets not available for use

These mostly represent in-process research and development assets acquired either through in-licensing arrangements, business combinations, asset acquisitions or separate purchases. At 31 December 2020 approximately 70% (2019: 70%) of the projects in the Pharmaceuticals Division have known decision points within the next twelve months which in certain circumstances could lead to impairment. Due to the inherent uncertainties in the research and development processes, intangible assets not available for use are particularly at risk of impairment if the project is not expected to result in a commercialised product.

Intangible asset impairment

Impairment charges arise from changes in the estimates of the future cash flows expected to result from the use of the asset and its eventual disposal. Factors such as the presence or absence of competition, technical obsolescence or lower-than-anticipated sales for products with capitalised rights could result in shortened useful lives or impairment.

Impairment charges – 2020

Pharmaceuticals Division. Impairment charges totalling CHF 425 million were recorded. The major items related to:

- A charge of CHF 342 million for the partial impairment of the intangible asset for SPK-8011, a novel gene therapy for the treatment of haemophilia A, acquired as part of the Spark Therapeutics acquisition. This impairment was a result of a delay in clinical trials, partly impacted by the COVID-19 pandemic, leading to reduced sales expectations. The asset concerned, which was not yet being amortised, was written down to its estimated recoverable amount of CHF 985 million.
- A charge of CHF 81 million for the partial impairment of the intangible asset for Luxturna, a marketed gene therapy for the treatment of patients with inherited retinal disease due to mutations in both copies of the RPE65 gene, which was acquired as part of the Spark Therapeutics acquisition. This impairment was a result of reduced sales expectations. The asset concerned was written down to its estimated recoverable amount of CHF 287 million. The intangible asset continues to be amortised over its remaining estimated useful life of 8 years.

Impairment charges – 2019

Pharmaceuticals Division. Impairment charges totalling CHF 633 million were recorded. The major items related to:

- A charge of CHF 168 million for the full impairment of a compound purchased separately, driven by a change in the development plan. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 137 million following clinical data assessment of two compounds. The assets concerned, which were not yet being amortised, were fully written down.
- A charge of CHF 125 million due to the decision to stop the development of a compound with an alliance partner. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 78 million for the partial impairment of a compound developed together with an alliance partner, mainly driven by reduced revenue forecasts. The asset concerned, which was not yet being amortised, was partially written down.
- A charge of CHF 60 million due to the decision to stop the development of a compound and the related collaboration activities with an alliance partner. The asset concerned, which was not yet being amortised, was fully written down.
- A charge of CHF 59 million due to the decision to stop the development of a compound purchased separately. The asset concerned, which was not yet being amortised, was fully written down.

Diagnostics Division. Impairment charges totalling CHF 344 million were recorded which related to:

- A charge of CHF 259 million for the impairment of Molecular Diagnostics product intangibles in use acquired as part of the GeneWeave acquisition. The main factors leading to this were updated assumptions on timelines, research and development expenses and production costs. The asset concerned, which was being amortised, was fully written down.
- A charge of CHF 85 million for the impairment of sequencing business product intangibles in use acquired as part of the Ariosa acquisition mainly due to a change in timelines for the launch of related sequencing products. The asset concerned, which was being amortised, was fully written down.

Potential commitments from alliance collaborations and purchase agreements within the next three years

The Group is party to in-licensing and similar arrangements with its alliance partners and intangible asset purchase agreements with third parties, including asset acquisitions. These arrangements and purchase agreements may require the Group to make certain milestone or other similar payments dependent upon the achievement of agreed objectives or performance targets as defined in the collaboration and purchase agreements.

The Group's current estimate of future third-party commitments for such payments within the next three years is set out in the table below. These figures are undiscounted and are not risk-adjusted, meaning that they include all such potential payments that can arise assuming all projects currently in development are successful. The timing is based on the Group's current best estimate. These figures do not include any potential commitments within the Group, such as may arise between the Roche and Chugai businesses.

Potential future third-party collaboration and purchase payments at 31 December 2020 in millions of CHF

	Pharmaceuticals	Diagnostics	Group
Within one year	1,198	20	1,218
Between one and two years	1,054	60	1,114
Between two and three years	709	4	713
Total	**2,961**	**84**	**3,045**

11. Inventories

Inventories in millions of CHF

	2020	2019	2018
Raw materials and supplies	1,354	1,296	1,206
Work in process	90	105	117
Intermediates	4,369	3,960	4,269
Finished goods	1,956	1,426	1,651
Provision for slow-moving and obsolete inventory	(575)	(732)	(622)
Total inventories	**7,194**	**6,055**	**6,621**

Inventories expensed through cost of sales totalled CHF 11.7 billion (2019: CHF 12.5 billion). Inventory write-downs during the year resulted in an expense of CHF 257 million (2019: CHF 558 million)

12. Accounts receivable

Accounts receivable in millions of CHF

	2020	2019	2018
Trade receivables	11,023	11,349	10,663
Notes receivable	53	51	96
Other receivables	54	64	38
Allowances for doubtful accounts	(515)	(532)	(540)
Chargebacks and other allowances to be withheld upon settlement [3]	(461)	(492)	(481)
Total accounts receivable [3]	**10,154**	**10,440**	**9,776**

Allowances for doubtful accounts: movements in recognised allowance in millions of CHF

	2020	2019
At 1 January	(532)	(540)
Additional allowances created	(113)	(102)
Unused amounts reversed	90	78
Utilised during the year	10	18
Currency translation effects	30	14
At 31 December	**(515)**	**(532)**

Bad debt expenses recorded as marketing and distribution costs totalled CHF 54 million (2019: expense of CHF 33 million).

13. Marketable securities

Marketable securities in millions of CHF

	2020	2019	2018
Equity securities at fair value through profit or loss	11	13	9
Debt securities at fair value through OCI	590	807	1,047
Money market instruments at fair value through OCI	2,734	1,491	3,198
Time accounts over three months at amortised costs	3,272	3,472	2,183
Total marketable securities	**6,607**	**5,783**	**6,437**

Marketable securities are held for fund management purposes and are primarily denominated in US dollars, euros and in Swiss francs. Money market instruments are contracted to mature within one year of 31 December 2020.

Debt securities – contracted maturity in millions of CHF

	2020	2019	2018
Within one year	158	276	170
Between one and five years	403	508	835
More than five years	29	23	42
Total debt securities	**590**	**807**	**1,047**

14. Cash and cash equivalents

Cash and cash equivalents in millions of CHF

	2020	2019	2018
Cash – cash in hand and in current or call accounts	4,536	4,769	4,139
Cash equivalents – time accounts with a maturity of three months or less	1,191	1,306	2,542
Total cash and cash equivalents	**5,727**	**6,075**	**6,681**

15. Other non-current assets

Other non-current assets in millions of CHF

	2020	2019	2018
Equity investments at fair value through OCI [31]	506	41	102
Equity investments at fair value through profit or loss [31]	768	696	458
Loans receivable	8	8	8
Restricted cash	2	2	2
Other receivables – contracts with customers [3]	37	38	25
Other receivables	80	82	99
Total financial non-current assets	**1,401**	**867**	**694**
Long-term employee benefits	214	229	225
Other assets	617	451	428
Total non-financial non-current assets	**831**	**680**	**653**
Associates	2	2	42
Total other non-current assets	**2,234**	**1,549**	**1,389**

Equity investments designated at fair value through OCI are mainly investments in private companies from the pharmaceutical sector, which are held as part of the Group's strategic alliance efforts.

16. Other current assets

Other current assets in millions of CHF

	2020	2019	2018
Accrued interest income	9	18	45
Derivative financial instruments [31]	398	178	138
Restricted cash	0	0	10
Cash collateral receivables	41	186	86
Other receivables – contracts with customers [3]	492	541	604
Other receivables	145	198	196
Total financial current assets	**1,085**	**1,121**	**1,079**
Prepaid expenses and accrued income	1,153	795	683
Other taxes recoverable	750	530	572
Other assets	123	218	187
Total non-financial current assets	**2,026**	**1,543**	**1,442**
Total other current assets	**3,111**	**2,664**	**2,521**

17. Accounts payable

Accounts payable in millions of CHF

	2020	2019	2018
Trade payables	3,317	3,176	2,847
Other taxes payable	480	428	442
Dividends payable	3	3	2
Other payables	321	215	235
Total accounts payable	**4,121**	**3,822**	**3,526**

18. Other non-current liabilities

Other non-current liabilities in millions of CHF

	2020	2019	2018
Deferred income	156	172	31
Lease liabilities [28]	876	879	–
Other long-term liabilities	75	93	157
Total other non-current liabilities	**1,107**	**1,144**	**188**

Other long-term liabilities are mainly related to accrued employee benefits. Following the implementation of IFRS 16 'Leases' (see Note 28), non-current lease liabilities of CHF 865 million were recorded, mainly for leases formerly classified as operating leases where the Group is the lessee, effective 1 January 2019.

19. Other current liabilities

Other current liabilities in millions of CHF

	2020	2019	2018
Deferred income	439	487	290
Lease liabilities [28]	319	340	–
Accrued payroll and related items	2,794	3,316	3,085
Interest payable	160	176	221
Derivative financial instruments [31]	286	266	153
Cash collateral payables	202	38	80
Accrued chargebacks and other allowances separately payable [3]	3,231	3,049	2,807
Accrued royalties and commissions	877	1,106	1,135
Other accrued liabilities	3,461	3,101	2,906
Total other current liabilities	**11,769**	**11,879**	**10,677**

Following the implementation of IFRS 16 'Leases' (see Note 28), current lease liabilities of CHF 329 million were recorded, mainly for leases formerly classified as operating leases where the Group is the lessee, effective 1 January 2019.

20. Provisions and contingent liabilities

Provisions: movements in recognised liabilities in millions of CHF

	Legal provisions	Environmental provisions	Restructuring provisions	Contingent consideration provisions	Other provisions	Total
Year ended 31 December 2019						
At 1 January 2019	578	491	868	511	1,333	3,781
Reclassification to lease liabilities on implementation of IFRS 16 'Leases' [28]	–	–	(22)	–	–	(22)
At 1 January 2019 (revised)	**578**	**491**	**846**	**511**	**1,333**	**3,759**
Additional provisions created	402	65	812	6	801	2,086
Unused amounts reversed	(33)	(5)	(91)	(152)	(111)	(392)
Utilised	(48)	(50)	(350)	(172)	(383)	(1,003)
Discount unwind [4]	0	17	0	14	0	31
Business combinations						
– Acquired companies	0	0	0	0	0	0
– Deferred consideration	–	–	–	–	0	0
– Contingent consideration	–	–	–	0	–	0
Asset acquisitions	0	0	0	–	0	0
Currency translation effects	(17)	(15)	(23)	(2)	(24)	(81)
At 31 December 2019	**882**	**503**	**1,194**	**205**	**1,616**	**4,400**
Current	858	99	668	18	1,242	2,885
Non-current	24	404	526	187	374	1,515
At 31 December 2019	**882**	**503**	**1,194**	**205**	**1,616**	**4,400**
Year ended 31 December 2020						
At 1 January 2020	882	503	1,194	205	1,616	4,400
Additional provisions created	77	10	579	10	699	1,375
Unused amounts reversed	(423)	(9)	(82)	(56)	(345)	(915)
Utilised	(96)	(53)	(489)	(9)	(754)	(1,401)
Discount unwind [4]	0	7	0	7	0	14
Business combinations						
– Acquired companies	0	0	0	0	0	0
– Deferred consideration	–	–	–	–	0	0
– Contingent consideration	–	–	–	0	–	0
Asset acquisitions	0	0	0	–	5	5
Currency translation effects	(45)	(15)	(30)	(7)	(92)	(189)
At 31 December 2020	**395**	**443**	**1,172**	**150**	**1,129**	**3,289**
Current	373	102	531	46	784	1,836
Non-current	22	341	641	104	345	1,453
At 31 December 2020	**395**	**443**	**1,172**	**150**	**1,129**	**3,289**
Expected outflow of resources						
Within one year	373	102	531	46	784	1,836
Between one and two years	18	147	335	1	56	557
Between two and three years	1	86	243	55	65	450
More than three years	3	108	63	48	224	446
At 31 December 2020	**395**	**443**	**1,172**	**150**	**1,129**	**3,289**

In 2020 CHF 1,401 million of provisions were utilised (2019: CHF 1,003 million), of which CHF 1,390 million (2019: CHF 828 million) are included in the cash flows from operating activities and CHF 11 million (2019: CHF 175 million) are included in the cash flows from business combinations for payments made from deferred and contingent consideration arrangements (see Note 6).

Legal provisions

Legal provisions consist of a number of separate legal matters, including claims arising from trade, in various Group companies. By their nature the amounts and timings of any outflows are difficult to predict.

As part of the regular review of litigation matters, management has reassessed the provisions recorded for certain litigation matters. Based on the development of the various litigations, notably the Accutane case in the US, some of the provisions previously held were released which resulted in an income of CHF 423 million. This was a major element in the expenses for legal cases in 2020, which show a net income of CHF 345 million included in general and administration (2019: net expenses of CHF 422 million). Details of the major legal cases outstanding are disclosed below.

Environmental provisions

Provisions for environmental matters include various separate environmental issues in a number of countries. By their nature the amounts and timings of any outflows are difficult to predict. Significant provisions are discounted by between 1% and 3% where the time value of money is material. The significant provisions relate to the US site in Nutley, New Jersey, which was divested in September 2016, the estimated remediation costs for a landfill site near Grenzach, Germany, that was used by manufacturing operations that were closed some years ago and the estimated remediation costs for the manufacturing site at Clarecastle, Ireland. In 2020 the net environmental expenses were nil (2019: net expense of CHF 59 million).

The Group's procedures on environmental protection are included in the Annual Report on pages 94 to 101. These include the actions taken by the Group with regard to climate change, notably the Group's commitment to reduce greenhouse gas emissions.

Restructuring provisions

These arise from planned programmes that materially change the scope of business undertaken by the Group or the manner in which business is conducted. Such provisions include only the costs necessarily entailed by the restructuring which are not associated with the recurring activities of the Group. The timings of these cash outflows are reasonably certain. These provisions are not discounted as the time value of money is not material in these matters.

In the Pharmaceuticals Division the significant provisions relate to the resourcing flexibility plans as well as to the redesign and the strategic realignment of its manufacturing network. In the Diagnostics Division the significant provisions are associated with programmes to address long-term strategy, while in Corporate they relate to initiatives for the outsourcing of operational activities to the global shared service centres and external providers. Further details are given in Note 7.

Contingent consideration provisions

The Group is party to certain contingent consideration arrangements arising from business combinations. Significant provisions are discounted using an average discount rate of 2.1% (2019: 3.0%) where the time value of money is material. Additional details on measurement and on the total potential payments under these arrangements are provided in Note 31.

Other provisions

Other provisions relate to the items shown in the table below. With the exception of employee provisions, the timing of cash outflows is by its nature uncertain.

Other provisions in millions of CHF

	2020	2019	2018
Sales returns [3]	473	616	497
Employee provisions	380	389	398
Other items	276	611	438
Total other provisions	**1,129**	**1,616**	**1,333**

At 31 December 2019 and 2018 other items included provisions that had previously been recorded for the estimated amount of a potential obligation for past royalties relating to the PDL-1 inhibitor litigation described below. In November 2020 a settlement agreement was reached for this dispute and the agreed cash settlement was recorded against these provisions.

Contingent liabilities

The operations and earnings of the Group continue, from time to time and in varying degrees, to be affected by political, legislative, fiscal and regulatory developments, including those relating to environmental protection, in the countries in which it operates. The industries in which the Group operates are also subject to other risks of various kinds. The nature and frequency of these developments and events, not all of which are covered by insurance, as well as their effect on future operations and earnings, are not predictable.

The Group has entered into strategic alliances with various companies in order to gain access to potential new products or to utilise other companies to help develop the Group's own potential new products. Potential future payments may become due to certain collaboration partners achieving certain milestones as defined in the collaboration agreements. The Group's best estimates of future commitments for such payments are given in Note 10.

Legal cases

At 31 December 2020 provisions for legal cases were CHF 317 million (2019: CHF 803 million), mainly related to legal cases in the Pharmaceuticals Division of CHF 53 million (2019: CHF 483 million) and in the Diagnostics Division of CHF 264 million (2019: CHF 314 million). Provisions have been recorded, and in some cases settled, mainly relating to Meso, a Diagnostics legal case, and to the Pharmaceuticals legal matters listed below.

Accutane. Hoffmann-La Roche Inc. ('HLR') and various other Roche affiliates have been named as defendants in numerous legal actions in the US and elsewhere relating to the acne medication Accutane. The litigation alleges that Accutane caused certain serious conditions, including, but not limited to, inflammatory bowel disease ('IBD'), birth defects and psychiatric disorders. In 2009 HLR announced that, following a re-evaluation of the portfolio of medicines that are now available from generic manufacturers, rapidly declining brand sales in the US and high costs from personal-injury lawsuits that it continues to defend vigorously, it had decided to immediately discontinue the manufacture and distribution of the product in the US.

All of the actions pending in federal court alleging IBD were consolidated for pre-trial proceedings in a Multi-District Litigation ('MDL') in the US District Court for the Middle District of Florida, Tampa Division. In August 2015 the MDL was closed. During the pendency of the MDL the District Court granted summary judgment in favour of HLR for all of the federal IBD cases that had proceeded and all were affirmed by the US Court of Appeals for the Eleventh Circuit. All of the actions pending in state court in New Jersey alleging IBD were consolidated for pre-trial proceedings in the Superior Court of New Jersey, Law Division, Atlantic County.

In February 2015 the Superior Court of New Jersey, Law Division, Atlantic County, held an eight-day evidentiary hearing on whether plaintiffs' experts can testify that Accutane causes Crohn's disease. On 20 February 2015 the Superior Court barred plaintiffs' experts because their methods did not meet the requirements for scientific reliability. On 8 May 2015 the Superior Court entered an order dismissing with prejudice an agreed-upon list of 2,076 Crohn's disease cases that were subject to the Superior Court's February 2015 order. On 28 July 2017 the New Jersey Appellate Division reversed the order excluding plaintiffs' experts from testifying that Accutane causes Crohn's disease and reinstated the dismissed cases finding that the trial court wrongfully barred plaintiffs' expert witnesses. HLR filed a petition for review to the New Jersey Supreme Court, which was granted on 8 December 2017. On 1 August 2018 the Supreme Court issued its decision on whether plaintiffs' experts can testify that Accutane causes Crohn's disease. The Supreme Court reversed the judgment of the New Jersey Appellate Division and concluded that the trial court properly had excluded the experts thereby dismissing 2,174 cases alleging that Accutane caused plaintiffs' Crohn's disease. Plaintiffs cannot further appeal. All 2,174 Crohn's disease cases were permanently dismissed.

On 12 May 2015 the Superior Court entered an order granting summary judgment and dismissing 18 cases filed by New Jersey residents on the basis that the drug label was adequate as a matter of law since 2002. In July 2015 the Superior Court granted HLR's motion for summary judgment as to the adequacy of the label for post-2002 ingestion cases in 44 other jurisdictions. The Superior Court applied New Jersey law to all of the jurisdictions and granted HLR's motion dismissing approximately 511 cases. In the alternative, the Superior Court applied the home state law and granted summary judgment in 24 jurisdictions and denied it in 20 jurisdictions; this would have resulted in 389 cases being dismissed. On 25 July 2017 the New Jersey Appellate Division affirmed the dismissal of 197 cases and reinstated judgments in 335 cases based on the strength of HLR's warnings after 2002. HLR and the dismissed plaintiffs filed petitions for review to the New Jersey Supreme Court, which was granted on 8 December 2017. On 3 October 2018 the Supreme Court issued its decision on those cases and reversed the judgment of the New Jersey Appellate Division that had reinstated 335 cases on the basis that the drug label was adequate as a matter of law since 2002. Plaintiffs cannot further appeal. 532 cases were permanently dismissed.

In January and October 2016 the Superior Court entered orders granting summary judgment and dismissing 191 cases for failure to prove Accutane proximately caused their ulcerative colitis. The plaintiffs appealed all of these decisions. During February and March 2017 the Superior Court held an evidentiary hearing on whether plaintiffs' experts can testify that Accutane causes ulcerative colitis. In April 2017 the Superior Court barred plaintiffs' experts because their methods did not meet the requirements for scientific reliability. In May 2017 the Superior Court entered an order dismissing 3,231 ulcerative colitis cases that were subject to the Superior Court's April 2017 order. The plaintiffs appealed these decisions.

At 31 December 2019 HLR was defending no pending actions and there were approximately 3,422 cases on appeal. After a hearing on 7 January 2020, on 17 January 2020 the New Jersey Appellate Division issued its decision on whether plaintiffs' experts can testify that Accutane causes ulcerative colitis. It affirmed the trial court's ruling and concluded that the trial court properly had excluded the experts thereby dismissing cases alleging that Accutane caused plaintiffs' ulcerative colitis. The plaintiffs filed a petition for appeal to the New Jersey Supreme Court. On 8 May 2020 the Supreme Court entered an order denying the petition. Plaintiffs cannot further appeal. All remaining cases were permanently dismissed. The Supreme Court had dismissed previously other cases in 2018. With this the matter in the US is now concluded.

Avastin/Lucentis investigations. On 14 February 2013 the Italian Antitrust Authority ('AGCM') announced an investigation to determine whether Roche, Genentech and Novartis had entered into an agreement to restrict competition in the Italian market for drugs, with reference in particular to Avastin (marketed by Roche) and Lucentis (marketed by Novartis). Avastin and Lucentis are two different drugs that were developed and approved for different therapeutic purposes and contain different active pharmaceutical ingredients. On 5 March 2014 the AGCM issued a verdict that alleges that Roche and Novartis colluded to artificially differentiate Avastin and Lucentis in order to foster the sales of Lucentis in Italy. The AGCM fined Roche EUR 90.5 million and Novartis EUR 92 million. Roche appealed the AGCM verdict to the Tribunale Amministrativo Regionale del Lazio ('TAR'). On 2 December 2014 the TAR upheld the decision by the AGCM. Roche appealed the verdict of the TAR to the Consiglio di Stato. In July 2014 Roche paid the EUR 90.5 million fine under protest to avoid additional penalty fees and recorded an expense within general and administration. On 23 January 2018 the European Court of Justice rendered its decision on five questions which were referred to the European Court of Justice by the Consiglio di Stato. On 15 July 2019 the Consiglio di Stato issued the final verdict on the case and upheld the verdicts of both the AGCM and the TAR. With respect to the fine of the AGCM, this matter is now concluded. The Italian Ministry of Health and some Italian regions notified the Group of their intention to seek damages related to this matter. On 24 January 2019 the French Competition Authority ('FCA') issued a Statement of Objections against Roche, Genentech and Novartis regarding anticompetitive practices concerning the commercialisation of Avastin and Lucentis in France. The FCA alleges that Roche, Genentech and Novartis abused their collective dominant position on the French market for the treatment of wet age-related macular degeneration between 2008 and 2013. On 9 September 2020 the FCA issued a decision finding that Roche, Genentech and Novartis had infringed competition law and imposed a fine of EUR 60 million against Roche and Genentech. Roche and Genentech appealed this decision. At 31 December 2020 a liability was held for the amount of the fine, which is included in accounts payable within the line item other payables (see Note 17). The fine will be paid under protest to avoid additional penalty fees and will be due not later than 15 February 2021. In addition the Group is challenging policies and regulations allowing off-label/unlicensed use and reimbursement for economic reasons in various countries. The Group is vigorously defending itself in these matters. The outcome of these matters cannot be determined at this time.

PDL-1 inhibitor litigation. On 26 July 2017 Bristol-Myers Squibb Co. ('BMS') filed a lawsuit against Genentech, Inc. ('Genentech') in Delaware, US. BMS alleges that Genentech's sale of Tecentriq infringes their US Patent No. 9,402,899. BMS is seeking judgment in its favour, a finding of wilfulness and monetary damages. On 4 October 2017 Genentech filed its answer and counterclaims, seeking a declaratory judgment of invalidity of the 9,402,899 patent. In May 2019 BMS and Genentech agreed to drop the lawsuit without prejudice to the case being refiled at a later date. In November 2020 BMS and Genentech reached a settlement agreement for this dispute. Under the terms of the agreement, the two parties concluded a royalty agreement for future worldwide sales of Tecentriq and Genentech made a cash settlement for past royalties. Provisions had previously been recorded for the estimated amount of this potential obligation for past royalties, and the agreed cash settlement was recorded against these provisions. The matter is now concluded.

Average Wholesale Prices litigation. HLR and Roche Laboratories Inc. ('RLI'), along with approximately 50 other brand and generic pharmaceutical companies, have been named as defendants in several legal actions in the US relating to the pricing of pharmaceutical drugs and State Medicaid reimbursement. The primary allegation in these litigations is that the pharmaceutical companies misrepresented or otherwise reported inaccurate Average Wholesale Prices ('AWP') and/or Wholesale Acquisition Costs ('WAC') for their drugs, which prices were allegedly relied upon by the states in calculating Medicaid reimbursements to entities such as retail pharmacies. The states, through their respective Attorney General, are seeking repayment of the amounts they claim were over-reimbursed. The time period associated with these cases is 1991 through 2005. At 31 December 2020 HLR and RLI are defending one AWP action filed in the state of New Jersey. HLR and RLI are vigorously defending themselves and no trial date has been set. The outcome of this matter cannot be determined at this time.

Boniva litigation. HLR, Genentech and various other Roche affiliates (collectively 'Roche') have been named as defendants in numerous legal actions in the US and one now dismissed case in Canada relating to the post-menopausal osteoporosis medication Boniva. In these litigations, the plaintiffs allege that Boniva caused either osteonecrosis of the jaw or atypical femoral fractures. At 31 December 2020 Roche is defending approximately 250 actions involving approximately 290 plaintiffs brought in federal and state courts throughout the US for personal injuries allegedly resulting from the use of Boniva. All of these cases are in the early discovery stages of litigation. Individual trial results depend on a variety of factors, including many that are unique to the particular case. Roche is vigorously defending itself in these matters. The outcome of these matters cannot be determined at this time.

Meso litigation. In February 2017 Roche Diagnostics Corporation ('Roche') filed a lawsuit in the US District Court for the District of Delaware against Meso Scale Diagnostics, LLC ('Meso'). This is a patent infringement case involving certain US patents owned by BioVeris Corporation ('BioVeris'), a company acquired by the Group in 2007. Meso holds a limited exclusive licence to use certain aspects of the electrochemiluminescence ('ECL') detection technology. Roche and Meso disagree on the scope of the licence. The lawsuit is seeking a declaratory judgment to get judicial clarification that Roche is not infringing Meso's licence. On 25 November 2019 the jury found that Roche's use of the patents infringed the scope of Meso's licence. There was no injunction granted and the jury awarded Meso USD 137 million in damages. In 2020 post-trial motions were filed by both parties and Meso moved for enhancement, pre-judgment interest and post-judgment royalties. The court hearing took place on 6 May 2020. On 23 December 2020 the US District Court issued the final order of judgment in which the jury award was confirmed and Meso's request for enhanced damages was denied. The Group will appeal this decision.

In addition, the Pharmaceuticals legal cases listed below do not currently have provisions recorded, but there are potential future obligations which will be confirmed only by the occurrence or non-occurrence of uncertain future events or where the obligation cannot be measured with sufficient reliability.

Hemlibra litigation. On 4 May 2017 Baxalta Inc. and Baxalta GmbH (both together 'Baxalta'), subsidiaries of Takeda Pharmaceutical Company Limited, filed a patent infringement and declaratory judgment of patent infringement suit in the US District Court for the District of Delaware, alleging that Genentech and Chugai Pharmaceutical Co., Ltd. ('Chugai') currently or imminently would manufacture, use, sell, offer for sale, or import into the US Hemlibra, which would infringe Baxalta's US Patent No. 7,033,590. Baxalta is seeking a judgment of infringement, injunctive and monetary relief, attorneys' fees, costs and expenses. On 11 May 2017 Genentech was served with the complaint. Genentech's response and counterclaims to the complaint were filed on 30 June 2017. On 19 June 2017 Chugai waived service. On 13 September 2017 Chugai filed a motion to dismiss the complaint for lack of personal jurisdiction. On 14 December 2017 Baxalta filed a request for a preliminary injunction against Genentech only, in which some inhibitor patients would not be subject to any injunction. A hearing was held in the US District Court for the District of Delaware on 13 and 14 June 2018 and during that hearing Baxalta withdrew its request for a preliminary injunction as to the inhibitor patients. On 25 June 2018 Baxalta submitted a new proposed preliminary injunction order, in which Genentech would be permitted to sell Hemlibra to all inhibitor patients, all non-inhibitor patients currently on Hemlibra whether through clinical trials or not, and selected non-inhibitor patients who have an additional 'medically diagnosed condition' which rendered factor VIII therapies impracticable. On 7 August 2018 the US District Court ruled against Baxalta, denying their request for an injunction. On 19 September 2018 Chugai was dismissed from this case. On 1 February 2019 the US District Court issued a final judgment in favour of Genentech stating that Hemlibra does not infringe Baxalta's patent based on the Court's definition of key terms related to the patent. On 8 February 2019 Baxalta appealed this decision. On 27 August 2020 the Appeals Court reversed the claim construction ruling of the US District Court in favour of Genentech and remanded the case back to the US District Court. The Group is vigorously defending itself in this matter. The outcome of this matter cannot be determined at this time.

On 28 March 2018, in the case brought by Baxalta against Chugai in Japan, the Tokyo District Court ruled in favour of Chugai, notably that Hemlibra does not infringe Baxalta's patent. On 10 May 2018 Baxalta appealed this decision. On 3 October 2019 the Japanese Intellectual Property High Court issued a ruling upholding the Tokyo District Court's decision. Baxalta has filed an appeal with the Japanese Supreme Court. In August 2020 the Japanese Supreme Court decided not to accept Baxalta's final appeal. Therefore, the decision of the Japanese Intellectual Property High Court is now final. While Baxalta's patent in Japan is valid, it is not infringed by Hemlibra. All pending legal actions in Japan were terminated and the matter in Japan is now concluded.

Iraqi Ministry of Health. In October 2017 F. Hoffmann-La Roche Ltd ('FHLR'), Hoffmann-La Roche Inc. ('HLR') and Genentech and certain other pharmaceutical and/or medical device companies were named as defendants in a complaint filed in the Federal District Court for the District of Columbia, US, on behalf of US service-members and their relatives who allege that they were killed or injured in Iraq between 2005 and 2009 (the 'Iraq lawsuit'). The complaint alleges that the defendants violated the US Anti-Terrorism Act and various state laws by providing funding for terrorist organisations through their sales practices pursuant to pharmaceutical and/or medical device contracts with the Iraqi Ministry of Health. In addition FHLR received an inquiry in July 2018 from the US Department of Justice in connection with an anti-corruption investigation relating to activities in Iraq, including interactions with the Iraqi government and certain of the same matters alleged in the Iraq lawsuit. On 29 October 2019 the US Department of Justice closed its inquiry against FHLR. On 17 July 2020 the Federal District Court granted the defendants' motions to dismiss. The plaintiffs appealed this decision. The Group is vigorously defending itself in this matter. The outcome of this matter cannot be determined at this time.

Tamiflu Qui tam litigation. In 2019, Roche Holding Ltd ('Roche Holding'), Hoffmann-La Roche, Inc. ('HLR') and Genentech, Inc. ('Genentech') were served with a lawsuit filed by a relator in the US District Court for the District of Maryland under the qui tam (whistleblower) provisions of the False Claims Act. The lawsuit was originally filed under seal years earlier on behalf of the US government and various US state governments. The lawsuit alleges certain improper conduct by the Group with respect to sales of Tamiflu to the US government and various US state governments. The US Department of Justice declined to intervene in the lawsuit. On 17 January 2020 the Group filed a motion to dismiss. On 28 September 2020 the plaintiff dismissed the complaint as to Roche Holding and Genentech and the District Court denied HLR's motion for summary judgment. The Group is vigorously defending itself in this matter. The outcome of this matter cannot be determined at this time.

21. Debt

Debt: movements in carrying value of recognised liabilities in millions of CHF

	2020	2019
At 1 January	14,363	18,770
Reclassification to lease liabilities on implementation of IFRS 16 'Leases' [28]	n/a	(4)
At 1 January (revised)	**14,363**	**18,766**
Proceeds from issue of bonds and notes	0	0
Redemption and repurchase of bonds and notes	0	(5,414)
Increase (decrease) in commercial paper	318	858
Increase (decrease) in other debt	341	153
Changes from financing cash flows	**659**	**(4,403)**
Net (gains) losses on redemption and repurchase of bonds and notes	0	199
Amortisation of debt discount [4]	9	12
Financing costs	**9**	**211**
Business combinations	0	1
Asset acquisitions	10	0
Net foreign currency transaction (gains) losses	112	(22)
Currency translation effects	(938)	(213)
Changes in foreign exchange rates	**(826)**	**(235)**
Changes in fair values of hedging instruments	1	23
Other changes	0	0
At 31 December	**14,216**	**14,363**
Bonds and notes	12,024	12,666
Commercial paper	1,576	1,406
Amounts due to banks and other financial institutions	613	288
Other borrowings	3	3
Total debt	**14,216**	**14,363**
Long-term debt	10,220	12,668
Short-term debt	3,996	1,695
Total debt	**14,216**	**14,363**

There are no pledges on the Group's assets in connection with debt.

Bonds and notes

Recognised liabilities and effective interest rates of bonds and notes in millions of CHF

	Effective interest rate Underlying instrument	Effective interest rate Including hedging	2020	2019	2018
US dollar notes – fixed rate					
2.25% notes due 30 September 2019, principal USD 1.5 billion (ISIN: US771196BA98)	2.34%	1.66%	–	–	1,467
2.875% notes due 29 September 2021, principal USD 1.3 billion, outstanding USD 0.64 billion (ISIN: US771196BB71)	2.98%	2.80%	569	625	1,278
1.75% notes due 28 January 2022, principal USD 0.65 billion (ISIN: US771196BM37)	1.87%	1.87%	572	629	634
3.25% notes due 17 September 2023, principal USD 0.75 billion, outstanding USD 0.39 billion (ISIN: US771196BN10)	3.32%	n/a	343	378	737
3.35% notes due 30 September 2024, principal USD 1.65 billion, outstanding USD 0.59 billion (ISIN: US771196BE11)	3.40%	n/a	519	571	1,622
3.0% notes due 10 November 2025, principal USD 1.0 billion, outstanding USD 0.51 billion (ISIN: US771196BJ08)	3.14%	n/a	444	488	978
2.625% notes due 15 May 2026, principal USD 1.0 billion (ISIN: US771196BK70)	2.78%	n/a	876	962	975
2.375% notes due 28 January 2027, principal USD 0.85 billion (ISIN: US771196BL53)	2.54%	n/a	743	816	828
3.625% notes due 17 September 2028, principal USD 0.65 billion (ISIN: US771196BP67)	3.69%	n/a	572	628	638
7.0% notes due 1 March 2039, principal USD 2.5 billion, outstanding USD 1.12 billion (ISIN: USU75000AN65 and US771196AU61)	7.43%	7.39%	954	1,048	1,129
4.0% notes due 28 November 2044, principal USD 0.65 billion (ISIN: US771196BH42)	4.16%	n/a	563	619	628
US dollar notes – floating rate					
Notes due 30 September 2019, principal USD 0.5 billion (ISIN: US771196AZ58)	1.65%	n/a	–	–	492
Euro Medium Term Note programme – fixed rate					
2.0% notes due 13 March 2020, principal USD 0.6 billion (ISIN: XS1197832089)	2.12%	1.74%	–	–	583
6.5% notes due 4 March 2021, principal EUR 1.75 billion, outstanding EUR 1.14 billion (ISIN: XS0415624716)	6.66%	6.96%	1,236	1,236	1,282
0.5% notes due 27 February 2023, principal EUR 0.65 billion (ISIN: XS1371715118)	0.63%	n/a	702	703	728
5.375% notes due 29 August 2023, principal GBP 0.25 billion, outstanding GBP 0.08 billion (ISIN: XS0175478873)	5.46%	n/a	92	97	96
0.875% notes due 25 February 2025, principal EUR 1.0 billion (ISIN: XS1195056079)	0.93%	0.93%	1,082	1,083	1,122
Swiss franc bonds – fixed rate					
1.625% bonds due 23 September 2022, principal CHF 0.5 billion (ISIN: CH0180513183)	1.64%	1.39%	502	504	504
0.1% bonds due 23 September 2024, principal CHF 0.75 billion (ISIN: CH0358654975)	0.11%	0.05%	751	750	750
0.25% bonds due 24 September 2025, principal CHF 0.5 billion (ISIN: CH0433761308)	0.25%	n/a	500	500	500
0.45% bonds due 23 March 2029, principal CHF 0.35 billion (ISIN: CH0359915409)	0.46%	n/a	350	350	350
0.75% bonds due 24 September 2030, principal CHF 0.4 billion (ISIN: CH0433761316)	0.74%	n/a	400	400	400
Genentech Senior Notes					
5.25% Senior Notes due 15 July 2035, principal USD 0.5 billion, outstanding USD 0.29 billion (ISIN: US368710AC32)	5.39%	n/a	254	279	320
Total bonds and notes			**12,024**	**12,666**	**18,041**

Bonds and notes maturity in millions of CHF

	2020	2019	2018
Within one year	1,804	0	1,959
Between one and two years	1,074	1,861	583
Between two and three years	1,138	1,132	2,560
Between three and four years	1,270	1,178	1,138
Between four and five years	2,026	1,320	1,560
More than five years	4,712	7,175	10,241
Total bonds and notes	**12,024**	**12,666**	**18,041**

Unamortised discount included in carrying value of bonds and notes in millions of CHF

	2020	2019	2018
US dollar notes	56	67	83
Euro notes	4	7	10
Swiss franc bonds	0	0	0
Pound sterling notes	0	0	1
Total unamortised discount	**60**	**74**	**94**

Issuance of bonds and notes – 2020

In 2020 the Group did not issue any bonds or notes.

Issuance of bonds and notes – 2019

In 2019 the Group did not issue any bonds or notes.

Redemption and repurchase of bonds and notes – 2020

In 2020 the Group did not repay any bonds or notes.

Redemption and repurchase of bonds and notes – 2019

Redemption of US dollar notes. On the due date of 30 September 2019 the Group repaid the 2.25% fixed rate notes with a principal amount of USD 1.5 billion. The cash outflow was CHF 1,486 million, plus accrued interest. The effective interest rate of these notes was 2.34%.

On the due date of 30 September 2019 the Group repaid the floating rate notes with a principal amount of USD 0.5 billion. The cash outflow was CHF 496 million, plus accrued interest. The effective interest rate of these notes was 1.65%.

On 13 December 2019 the Group resolved to exercise its option to call for early redemption of the 2.0% fixed rate notes with a principal amount of USD 0.6 billion at par three months before the scheduled due date of 13 March 2020. The cash outflow was CHF 591 million, plus accrued interest. The effective interest rate of these notes was 2.12%.

On 5 December 2019 the Group completed a tender offer to redeem the following instruments:
- USD 656 million 2.875% fixed rate notes due 29 September 2021; effective interest rate 2.98%.
- USD 360 million 3.25% fixed rate notes due 17 September 2023; effective interest rate 3.32%.
- USD 1,061 million 3.35% fixed rate notes due 30 September 2024; effective interest rate 3.40%.
- USD 494 million 3.0% fixed rate notes due 10 November 2025; effective interest rate 3.14%.
- USD 37 million 5.25% fixed rate notes due 15 July 2035; effective interest rate 5.39%.
- USD 73 million 7.0% fixed rate notes due 1 March 2039; effective interest rate 7.43%.

The cash outflow was CHF 2,841 million, plus accrued interest and there was a loss on redemption of CHF 202 million, which included CHF 3 million paid for bank fees.

Cash flows from redemption and repurchase of bonds and notes

Cash outflows from redemption and repurchase of bonds and notes in millions of CHF

	2020	2019
Euro Medium Term Note programme – US dollar notes	0	(591)
US dollar notes	0	(4,823)
Total cash outflows from redemption and repurchase of bonds and notes	**0**	**(5,414)**

Commercial paper

Roche Holdings, Inc. commercial paper program. Roche Holdings, Inc. has an established commercial paper program under which it can issue up to USD 7.5 billion of unsecured commercial paper notes guaranteed by Roche Holding Ltd. The committed credit line that is available as a back-stop supporting the commercial paper program is USD 7.5 billion at 31 December 2020. On 3 July 2019 the previously existing committed credit lines were refinanced by one new committed credit line with an initial maturity of five years. The maturity of the notes under the program cannot exceed 365 days from the date of issuance. At 31 December 2020 unsecured commercial paper notes with a principal amount of USD 1.8 billion and an average interest rate of 0.12% were outstanding.

Movements in commercial paper obligations in millions of CHF

	2020	2019
At 1 January	1,406	578
Net cash proceeds (payments)	318	858
Currency translation effects	(148)	(30)
At 31 December	**1,576**	**1,406**

Amounts due to banks and other financial institutions

These amounts are denominated in various currencies and the average interest rate was 3.80% (2019: 5.96%). At 31 December 2020 the amounts outstanding of CHF 613 million (2019: CHF 288 million) are due within one year.

22. Equity attributable to Roche shareholders

Changes in equity attributable to Roche shareholders in millions of CHF

	Share capital	Retained earnings	Fair value reserves	Hedging reserves	Translation reserves	Total
Year ended 31 December 2019						
At 1 January 2019	160	34,931	28	47	(7,548)	27,618
Net income recognised in income statement	–	13,497	–	–	–	13,497
Financial assets at fair value through OCI						
– Fair value gains (losses) – equity investments at fair value through OCI	–	–	(5)	–	–	(5)
– Fair value gains (losses) taken to retained earnings on disposal of equity investments at fair value through OCI	–	53	(53)	–	–	–
– Fair value gains (losses) – debt securities at fair value through OCI	–	–	12	–	–	12
– Fair value gains (losses) transferred to income statement – debt securities at fair value through OCI	–	–	0	–	–	0
– Income taxes [5]	–	(15)	17	–	–	2
– Non-controlling interests	–	(15)	16	–	–	1
Cash flow hedges						
– Gains (losses) taken to equity	–	–	–	(72)	–	(72)
– Transferred to income statement [a)]	–	–	–	20	–	20
– Income taxes [5]	–	–	–	13	–	13
– Non-controlling interests	–	–	–	5	–	5
Currency translation of foreign operations						
– Exchange differences	–	–	0	0	(428)	(428)
– Accumulated differences transferred to income statement on divestment of subsidiaries	–	–	–	–	(14)	(14)
– Non-controlling interests	–	–	–	–	25	25
Defined benefit plans						
– Remeasurement gains (losses) [26]	–	(518)	–	–	–	(518)
– Limit on asset recognition [26]	–	2	–	–	–	2
– Income taxes [5]	–	102	–	–	–	102
– Non-controlling interests	–	(1)	–	–	–	(1)
Other comprehensive income, net of tax	**–**	**(392)**	**(13)**	**(34)**	**(417)**	**(856)**
Total comprehensive income	**–**	**13,105**	**(13)**	**(34)**	**(417)**	**12,641**
Dividends	–	(7,449)	–	–	–	(7,449)
Equity compensation plans, net of transactions in own equity	–	(52)	–	–	–	(52)
Changes in ownership interest in subsidiaries	–	(9)	–	–	–	(9)
Changes in non-controlling interests	–	(2)	–	–	–	(2)
At 31 December 2019	**160**	**40,524**	**15**	**13 [b)]**	**(7,965)**	**32,747**

a) The entire amount transferred to the income statement was reported in other financial income (expense).
b) Cost of hedging reserve related to the EUR/USD cross-currency swap is included in the hedging reserve and amounted to CHF 5 million, net of tax.

Changes in equity attributable to Roche shareholders in millions of CHF

	Share capital	Retained earnings	Fair value reserves	Hedging reserves	Translation reserves	Total
Year ended 31 December 2020						
At 1 January 2020	160	40,524	15	13	(7,965)	32,747
Net income recognised in income statement	–	14,295	–	–	–	14,295
Financial assets at fair value through OCI						
– Fair value gains (losses) – equity investments at fair value through OCI	–	–	113	–	–	113
– Fair value gains (losses) taken to retained earnings on disposal of equity investments at fair value through OCI	–	12	(12)	–	–	–
– Fair value gains (losses) – debt securities at fair value through OCI	–	–	7	–	–	7
– Fair value gains (losses) transferred to income statement – debt securities at fair value through OCI	–	–	0	–	–	0
– Income taxes [5]	–	1	(15)	–	–	(14)
– Non-controlling interests	–	0	0	–	–	0
Cash flow hedges						
– Gains (losses) taken to equity	–	–	–	34	–	34
– Transferred to income statement [a)]	–	–	–	(88)	–	(88)
– Income taxes [5]	–	–	–	15	–	15
– Non-controlling interests	–	–	–	10	–	10
Currency translation of foreign operations						
– Exchange differences	–	–	(2)	–	(1,647)	(1,649)
– Accumulated differences transferred to income statement on divestment of subsidiaries	–	–	–	–	(8)	(8)
– Non-controlling interests	–	–	–	–	140	140
Defined benefit plans						
– Remeasurement gains (losses) [26]	–	(315)	–	–	–	(315)
– Limit on asset recognition [26]	–	0	–	–	–	0
– Income taxes [5]	–	128	–	–	–	128
– Non-controlling interests	–	(12)	–	–	–	(12)
Other comprehensive income, net of tax	**–**	**(186)**	**91**	**(29)**	**(1,515)**	**(1,639)**
Total comprehensive income	**–**	**14,109**	**91**	**(29)**	**(1,515)**	**12,656**
Dividends	–	(7,700)	–	–	–	(7,700)
Equity compensation plans, net of transactions in own equity	–	(1,360)	–	–	–	(1,360)
Changes in ownership interest in subsidiaries	–	0	–	–	–	0
Changes in non-controlling interests	–	(2)	–	–	–	(2)
At 31 December 2020	**160**	**45,571**	**106**	**(16)[b)]**	**(9,480)**	**36,341**

a) The entire amount transferred to the income statement was reported in other financial income (expense).
b) Cost of hedging reserve related to the EUR/USD cross-currency swap is included in the hedging reserve and amounted to CHF 3 million, net of tax.

Genentech transaction

The Group completed the purchase of the non-controlling interests in Genentech effective 26 March 2009. Based on the International Accounting Standard 27 'Separate Financial Statements' (IAS 27) and consistent with the International Financial Reporting Standard 10 'Consolidated Financial Statements' (IFRS 10), which was adopted by the Group in 2013, this transaction was accounted for in full as an equity transaction. As a consequence, the carrying amount of the consolidated equity of the Group at that time was reduced by CHF 52.2 billion, of which CHF 8.5 billion was allocated to eliminate the book value of Genentech non-controlling interests. This accounting effect significantly impacted the Group's net equity, but has no effect on the Group's business or its dividend policy.

Share capital

At 31 December 2020 the authorised and issued share capital of Roche Holding Ltd, which is the Group's parent company, consisted of 160 million shares with a nominal value of CHF 1.00 each, as in the preceding year. The shares are bearer shares and the Group does not maintain a register of shareholders. Based on information supplied to the Group, a shareholder group with pooled voting rights owns 45.01% (2019: 45.01%) of the issued shares. On 5 December 2019 the shareholder group announced that it would continue the shareholder pooling agreement existing since 1948 with a modified shareholder composition. The duration of the pool was extended for an indefinite period in 2009. The shareholder group with pooled voting rights holds 72,018,000 shares, corresponding to 45.01% of the shares issued. This figure does not include any shares without pooled voting rights that are held outside this group by individual members of the group. Ms Maja Oeri, formerly a member of the pool, holds 8,091,900 shares representing 5.057% of the voting rights independently of the pool. This is further described in Note 32. Based on information supplied to the Group, Novartis Holding AG, Basel, owns 33.333% (participation below 33⅓%) of the issued shares (2019: 33.333%).

Non-voting equity securities *(Genussscheine)*

At 31 December 2020 702,562,700 non-voting equity securities have been authorised and were in issue as in the preceding year. Under Swiss company law these non-voting equity securities have no nominal value, are not part of the share capital and cannot be issued against a contribution which would be shown as an asset in the balance sheet of Roche Holding Ltd.
Each non-voting equity security confers the same rights as any of the shares to participate in the net profit and any remaining proceeds from liquidation following repayment of the nominal value of the shares and, if any, participation certificates.
In accordance with the law and the Articles of Incorporation of Roche Holding Ltd, the Company is entitled at all times to exchange all or some of the non-voting equity securities into shares or participation certificates.

Dividends

On 17 March 2020 the shareholders approved the distribution of a dividend of CHF 9.00 per share and non-voting equity security (2019: CHF 8.70) in respect of the 2019 business year. The distribution to holders of outstanding shares and non-voting equity securities totalled CHF 7,700 million (2019: CHF 7,449 million) and has been recorded against retained earnings in 2020. The Board of Directors has proposed dividends for the 2020 business year of CHF 9.10 per share and non-voting equity security which, if approved, would result in a total distribution to shareholders of CHF 7,849 million. This is subject to approval at the Annual General Meeting on 16 March 2021.

Own equity instruments

Holdings of own equity instruments in equivalent number of non-voting equity securities

	2020 (millions)	2019 (millions)
Shares	0	0
Non-voting equity securities	9.4	6.8
Total	**9.4**	**6.8**

Own equity instruments are recorded within equity at original purchase cost. At 31 December 2020 the fair value of shares was CHF 6.8 million and the fair value of non-voting equity securities was CHF 2.9 billion. Own equity instruments are held for the Group's potential conversion obligations that may arise from the Group's equity compensation plans (see Note 27).

Reserves

Fair value reserve. At 31 December 2020 the fair value reserve represents the cumulative net change in the fair value of financial assets at fair value through OCI until the asset is sold, impaired or otherwise disposed of.

Hedging reserve. The hedging reserve represents the effective portion of the cumulative net change in the fair value of cash flow hedging instruments related to hedged transactions that have not yet occurred.

Translation reserve. The translation reserve represents the cumulative currency translation differences relating to the consolidation of Group companies that use functional currencies other than Swiss francs.

23. Subsidiaries

Chugai

Effective 1 October 2002 the Roche Group and Chugai completed an alliance to create a leading research-driven Japanese pharmaceutical company, which was formed by the merger of Chugai and Roche's Japanese pharmaceuticals subsidiary, Nippon Roche. The merged company is known as Chugai.

Consolidated subsidiary. Chugai is a fully consolidated subsidiary of the Group. This is based on the Group's interest in Chugai at 31 December 2020 of 61.2% (2019: 61.2%) and the Roche relationship with Chugai that is founded on the Basic Alliance, Licensing and Research Collaboration Agreements.

The common stock of Chugai is publicly traded and is listed on the Tokyo Stock Exchange under the stock code 'TSE:4519'. On 21 January 2020 Chugai announced a split of its common stock. Effective 1 July 2020 the number of issued shares has increased from 559,685,889 to 1,679,057,667 (three-for-one split). Chugai prepares financial statements in accordance with International Financial Reporting Standards (IFRS) that are filed on a quarterly basis with the Tokyo Stock Exchange. Due to certain consolidation entries there are minor differences between Chugai's stand-alone IFRS results and the results of Chugai as consolidated by the Roche Group in accordance with IFRS.

Chugai summarised financial information in millions of CHF

	2020	2019
Income statement		
Sales [2]	5,569	5,367
Royalties and other operating income [2]	1,366	885
Total revenues	**6,935**	**6,252**
Operating profit [2]	2,654	1,940
Balance sheet		
Non-current assets	3,447	3,210
Current assets	7,211	6,337
Non-current liabilities	(191)	(255)
Current liabilities	(2,012)	(1,591)
Total net assets	**8,455**	**7,701**
Cash flows		
Cash flows from operating activities	1,803	1,883
Cash flows from investing activities	(864)	(745)
Cash flows from financing activities	(875)	(609)

Dividends. The dividends distributed to third parties holding Chugai shares during 2020 totalled CHF 312 million (2019: CHF 199 million) and have been recorded against non-controlling interests (see Note 24). Dividends paid by Chugai to Roche are eliminated on consolidation as intercompany items.

Roche's relationship with Chugai. Chugai has entered into certain agreements with Roche, which are discussed below:

(1) Basic Alliance Agreement – As part of the Basic Alliance Agreement signed in December 2001, Roche and Chugai entered into certain arrangements covering the future operation and governance of Chugai. Amongst other matters these cover the following areas:
- The structuring of the alliance.
- Roche's rights as a shareholder.
- Roche's rights to nominate members of Chugai's Board of Directors.
- Certain limitations to Roche's ability to buy or sell Chugai's common stock.

Chugai issues additional shares of common stock in connection with its convertible debt and equity compensation plans, and may issue additional shares for other purposes, which affects Roche's percentage ownership interest. The Basic Alliance Agreement provides, amongst other matters, that Chugai will guarantee Roche's right to maintain its shareholding percentage in Chugai at not less than 50.1%.

(2) Licensing Agreements – Under the Japan Umbrella Rights Agreement signed in December 2001, Chugai has exclusive rights to market Roche's pharmaceutical products in Japan. Chugai has the right of first refusal on the development and marketing in Japan of all development compounds advanced by Roche.

The Rest of the World Umbrella Rights Agreement (excluding Japan and South Korea) signed in May 2002 was revised and the Amended and Restated Rest of the World Umbrella Rights Agreement (excluding Japan, South Korea and Taiwan) was signed in August 2014. Under this Agreement Chugai shall offer and Roche has the right of first refusal on the development and marketing of Chugai's development compounds in markets outside Japan, excluding South Korea and Taiwan.

Further to these agreements, Roche and Chugai have signed a series of separate agreements for certain specific products. Depending on the specific circumstances and the terms of the agreement, this may result in payments on an arm's length basis between Roche and Chugai, for any or all of the following matters:
- Upfront payments, if a right of first refusal to license a product is exercised.
- Milestone payments, dependent upon the achievement of agreed performance targets.
- Royalties on future product sales.

These specific product agreements may also cover the manufacture and supply of the respective products to meet the other party's clinical and/or commercial requirements on an arm's length basis.

(3) Research Collaboration Agreements – Roche and Chugai have entered into research collaboration agreements in the areas of small-molecule synthetic drug research and biotechnology-based drug discovery.

24. Non-controlling interests

Changes in equity attributable to non-controlling interests in millions of CHF

	2020	2019
At 1 January	3,120	2,744
Net income recognised in income statement		
– Chugai	735	562
– Other non-controlling interests	38	49
Total net income recognised in income statement	**773**	**611**
Equity investments at fair value through OCI	0	(1)
Debt securities at fair value through OCI	0	0
Cash flow hedges	(10)	(5)
Currency translation of foreign operations	(140)	(25)
Remeasurements of defined benefit plans	12	1
Other comprehensive income, net of tax	**(138)**	**(30)**
Total comprehensive income	**635**	**581**
Business combinations	0	0
Dividends to non-controlling shareholders		
– Chugai [23]	(312)	(199)
– Other non-controlling interests	(18)	(14)
Equity compensation plans, net of transactions in own equity	5	5
Changes in ownership interest in subsidiaries	0	(12)
Changes in non-controlling interests	2	2
Equity contribution by non-controlling interests	0	13
At 31 December	**3,432**	**3,120**
Chugai	3,223	2,924
Other non-controlling interests	209	196
Total non-controlling interests	**3,432**	**3,120**

25. Employee benefits

Employee remuneration in millions of CHF

	2020	2019
Wages and salaries	11,287	11,631
Social security costs	1,105	1,138
Defined contribution plans [26]	409	410
Operating expenses for defined benefit plans [26]	656	598
Equity compensation plans [27]	713	597
Termination costs [7]	517	724
Other employee benefits	940	1,162
Employee remuneration included in operating results	**15,627**	**16,260**
Net interest cost of defined benefit plans [26]	101	140
Total employee remuneration	**15,728**	**16,400**

Other employee benefits consist mainly of life insurance schemes and certain other insurance schemes providing medical coverage and other long-term and short-term disability benefits.

26. Pensions and other post-employment benefits

The Group's objective is to provide attractive and competitive post-employment benefits to employees, while at the same time ensuring that the various plans are appropriately financed and managing any potential impacts on the Group's long-term financial position. Most employees are covered by pension plans sponsored by Group companies. The nature of such plans varies according to legal regulations, fiscal requirements and market practice in the countries in which the employees are employed. Post-employment benefit plans are classified for IFRS as 'defined contribution plans' if the Group pays fixed contributions into a separate fund or to a third-party financial institution and will have no further legal or constructive obligation to pay further contributions. All other plans are classified as 'defined benefit plans'.

Defined contribution plans

Defined contribution plans are funded through payments by employees and by the Group to funds administered by third parties. The Group's expenses for these plans were CHF 409 million (2019: CHF 410 million). No assets or liabilities are recognised in the Group's balance sheet in respect of such plans, apart from regular prepayments and accruals of the contributions withheld from employees' wages and salaries and of the Group's contributions. The Group's major defined contribution plan is the US Roche 401(k) Savings Plan.

Defined benefit plans

Plans are usually established as trusts independent of the Group and are funded by payments from Group companies and by employees. In some cases, notably for the major defined benefit plans in Germany, the plans are unfunded and the Group pays pensions to retired employees directly from its own financial resources. Plans are usually governed by a senior governing body, such as a Board of Trustees, which is typically composed of both employee and employer representatives. Funding of these plans is determined by local regulations using independent actuarial valuations. Separate independent actuarial valuations are prepared in accordance with the requirements of IAS 19 for use in the Group's financial statements. The Group's major pension plans are located in Switzerland, the US and Germany, which in total account for 85% of the Group's defined benefit obligation (2019: 84%).

Pension plans in Switzerland. Current pension arrangements for employees in Switzerland are made through plans governed by the Swiss Federal Occupational Old Age, Survivors and Disability Pension Act ('BVG'). The Group's pension plans are administered by separate legal foundations, which are funded by regular employee and company contributions. The final benefit is contribution based with certain minimum guarantees. Due to these minimum guarantees, the Swiss plans are treated as defined benefit plans for the purposes of these IFRS financial statements, although they have many of the characteristics of defined contribution plans. Where there is an underfunding, this may be remedied by various measures such as increasing employee and company contributions, lowering the interest rate on retirement account balances, reducing prospective benefits and a suspension of the early withdrawal facility.

Pension plans in the US. The Group's major defined benefit plans in the US have been closed to new members since 2007. New employees in the US now join the defined contribution plan. The largest of the remaining defined benefit plans are funded pension plans together with smaller unfunded supplementary retirement plans. The benefits are based on the highest average annual rate of earnings during a specified period and length of employment. The plans are non-contributory for employees, with the Group making periodic payments to the plans. Where there is an underfunding, this would normally be remedied by additional company contributions. In 2020 and 2019 no payments were made by the Group.

Pension plans in Germany. The Group's major pension arrangements in Germany are governed by the Occupational Pensions Act ('BetrAVG'). These plans are unfunded and the Group pays pensions to retired employees directly from its own financial resources. These plans are non-contributory for employees. The benefits are based on final salary and length of employment. These plans have been closed to new members since 2007. They have been replaced by a new plan which is funded by regular employee and company contributions and administered through a contractual trust agreement. The final benefit is contribution based with a minimum guarantee. Due to this minimum guarantee, this plan is treated as a defined benefit plan for the purposes of these IFRS financial statements, although it has many of the characteristics of a defined contribution plan.

Pension plans in the Rest of the World. These represent approximately 10% of the Group's defined benefit obligation (2019: 11%) and consist of a number of smaller plans in various countries. Of these the largest are the pension plans at Chugai, which are independently managed by Chugai, and the main pension plan in the United Kingdom. In 2020 Chugai has made additional voluntary contributions of JPY 2.3 billion to its pension plans (2019: JPY 9.0 billion). The Chugai plans are fully described in Chugai's own IFRS financial statements. The UK pension plan is funded by regular employee and company contributions, with benefits based on final salary and length of employment. This plan has been closed to new members since 2003 and has been replaced with a defined contribution plan.

Other post-employment benefit ('OPEB') plans. These represent approximately 5% of the Group's defined benefit obligation (2019: 5%) and consist of post-employment healthcare and life insurance schemes, mainly in the US. These plans are mainly unfunded and/or are contributory for employees, with the Group reimbursing retired employees directly from its own financial resources. The Group's major OPEB plans in the US have been closed to new members since 2011. 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. In 2020 and 2019 no payments were made by the Group to these plans. At 31 December 2020 the IFRS funding status was 57% (2019: 50%), including reimbursement rights, for the funded OPEB plans in the US.

Defined benefit plans: income statement in millions of CHF

	2020			2019		
	Pension plans	Other post-employment benefit plans	Total expense	Pension plans	Other post-employment benefit plans	Total expense
Current service cost	644	13	657	567	11	578
Past service (income) cost	1	0	1	21	0	21
Settlement (gain) loss	(2)	0	(2)	(1)	0	(1)
Total operating expenses	**643**	**13**	**656**	**587**	**11**	**598**
Net interest cost of defined benefit plans	78	23	101	109	31	140
Total expense recognised in income statement	**721**	**36**	**757**	**696**	**42**	**738**

Funding status

The funding of the Group's various defined benefit plans is the responsibility of the respective senior governing body, such as a Board of Trustees, and the sponsoring employer, and is managed based on local statutory valuations, which follow the legislation and requirements of the respective jurisdiction in which the plan is established. Qualified independent actuaries carry out statutory actuarial valuations on a regular basis. The actuarial assumptions determining the funding status on the statutory basis are regularly assessed by the local senior governing body. The funding status is closely monitored at a corporate level. The unfunded plans are mainly those in the Group's German affiliates, where the fully reserved pension obligations are used for self-financing of the local affiliate's operations.

The IFRS funding status of the funded defined benefit plans increased to 94% (2019: 92%).

Reimbursement rights are linked to the post-employment medical plans in the US and represent the expected reimbursement of the medical expenditure provided under the Medicare Prescription Drug, Improvement, and Modernization Act of 2003.

Defined benefit plans: funding status in millions of CHF

	2020			2019		
	Pension plans	Other post-employment benefit plans	Total	Pension plans	Other post-employment benefit plans	Total
Funded plans						
– Fair value of plan assets	17,639	328	17,967	16,835	352	17,187
– Defined benefit obligation	(18,290)	(757)	(19,047)	(17,610)	(976)	(18,586)
Over (under) funding	**(651)**	**(429)**	**(1,080)**	**(775)**	**(624)**	**(1,399)**
Unfunded plans						
– Defined benefit obligation	(5,506)	(396)	(5,902)	(4,971)	(298)	(5,269)
Total funding status	**(6,157)**	**(825)**	**(6,982)**	**(5,746)**	**(922)**	**(6,668)**
Limit on asset recognition	0	0	0	0	0	0
Reimbursement rights	–	118	118	–	133	133
Net recognised asset (liability)	**(6,157)**	**(707)**	**(6,864)**	**(5,746)**	**(789)**	**(6,535)**
Reported in balance sheet						
– Defined benefit plan assets	849	118	967	812	133	945
– Defined benefit plan liabilities	(7,006)	(825)	(7,831)	(6,558)	(922)	(7,480)

Plan assets

The responsibility for the investment strategies of funded plans is with the respective senior governance body, such as the Board of Trustees. Asset-liability studies are performed regularly for all major pension plans. These studies examine the obligations from post-employment benefit plans, and evaluate various investment strategies with respect to key financial measures such as expected returns, expected risks, expected contributions, and expected funded status of the plan in an interdependent way. The goal of an asset-liability study is to select an appropriate asset allocation for the funds held within the plan. The investment strategy is developed to optimise expected returns, to manage risks and to contain fluctuations in the statutory funded status. Asset-liability studies include strategies to match the cash flows of the assets with the plan obligations. The Group currently does not use longevity swaps to manage longevity risk.

Plan assets are managed using internal and external asset managers. The actual performance is continually monitored by the pension fund governance bodies as well as being closely monitored at a corporate level. In these financial statements the difference between the interest income and actual return on plan assets is a remeasurement that is recorded directly to other comprehensive income. In 2020 the actual return on plan assets was a gain of CHF 1,452 million (2019: gain of CHF 2,083 million), which excludes the actual return on reimbursement rights.

The recognition of plan assets is limited to the present value of any economic benefits available from refunds from the plans or reductions in future contributions to the plans.

Defined benefit plans: fair value of plan assets and reimbursement rights in millions of CHF

	2020			2019		
	Pension plans	Other post-employment benefit plans	Total	Pension plans	Other post-employment benefit plans	Total
At 1 January	16,835	485	17,320	14,962	420	15,382
Interest income on plan assets and reimbursement rights	155	15	170	258	18	276
Remeasurements on plan assets and reimbursement rights	1,228	53	1,281	1,728	108	1,836
Currency translation effects	(467)	(45)	(512)	(54)	(15)	(69)
Employer contributions	412	(2)	410	493	0	493
Employee contributions	157	8	165	149	11	160
Benefits paid – funded plans	(621)	(66)	(687)	(696)	(55)	(751)
Benefits paid – settlements	(56)	0	(56)	0	0	0
Administration costs	(4)	(2)	(6)	(5)	(2)	(7)
At 31 December	**17,639**	**446**	**18,085**	**16,835**	**485**	**17,320**

Defined benefit plans: composition of plan assets in millions of CHF

	2020	2019
Equity securities	5,059	4,639
Debt securities	7,577	7,439
Property	2,444	2,376
Cash and money market instruments	432	367
Other investments	2,455	2,366
At 31 December	**17,967**	**17,187**

Assets are invested in a variety of different classes in order to maintain a balance between risk and return as follows:

- Equity and debt securities which mainly have quoted market prices (Level 1 fair value hierarchy).
- Property which is primarily in private and commercial property funds which mainly have other observable inputs (Level 2 fair value hierarchy).
- Cash and money market instruments which are mainly invested with financial institutions with a credit rating no lower than A.
- Other investments which mainly consist of alternatives, mortgages, commodities and insurance contracts. These are used for risk management purposes and mainly have other observable inputs (Level 2 fair value hierarchy) and unobservable inputs (Level 3 fair value hierarchy).

Included within the fair value of plan assets are the Group's shares and non-voting securities with a fair value of CHF 156 million (2019: CHF 177 million) and debt instruments issued by the Group with a fair value of CHF 5 million (2019: CHF 5 million).

Defined benefit obligation

The defined benefit obligation is calculated using the projected unit credit method. This reflects service rendered by employees to the dates of valuation and incorporates actuarial assumptions primarily regarding discount rates used in determining the present value of benefits, projected rates of remuneration growth and mortality rates. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of high-quality corporate bonds or government bonds in countries where there is not a deep market in corporate bonds. The corporate or government bonds are denominated in the currency in which the benefits will be paid, and have maturity terms approximating to the terms of the related pension obligation.

The Group's final salary-based defined benefit pension plans in the US, Germany and the United Kingdom have been closed to new participants. Active employees that had been members of these pension plans at the time these were closed to new participants continue to accrue benefits in the final salary-based defined benefit pension plans. New employees in the US and UK now join the Group's defined contribution plans, while new employees in Germany join the contribution-based plan with a minimum guarantee. As a result, the proportion of the defined benefit obligation which relates to these closed plans is expected to decrease in the future. The defined benefit pension plans in Switzerland, where the final benefit is contribution based with a minimum guarantee, remain open to new employees.

Defined benefit plans: defined benefit obligation in millions of CHF

	2020			2019		
	Pension plans	Other post-employment benefit plans	Total	Pension plans	Other post-employment benefit plans	Total
At 1 January	22,581	1,274	23,855	20,368	1,152	21,520
Current service cost	644	13	657	567	11	578
Interest cost	233	38	271	367	49	416
Remeasurements:						
– demographic assumptions	(27)	(35)	(62)	(8)	(6)	(14)
– financial assumptions	1,288	62	1,350	2,144	143	2,287
– experience adjustments	312	(4)	308	80	(1)	79
Currency translation effects	(537)	(123)	(660)	(239)	(18)	(257)
Employee contributions	157	8	165	149	11	160
Benefits paid – funded plans	(621)	(66)	(687)	(696)	(55)	(751)
Benefits paid – unfunded plans	(177)	(14)	(191)	(171)	(12)	(183)
Benefits paid – settlements	(56)	0	(56)	0	0	0
Past service (income) cost	1	0	1	21	0	21
Settlement (gain) loss	(2)	0	(2)	(1)	0	(1)
At 31 December	**23,796**	**1,153**	**24,949**	**22,581**	**1,274**	**23,855**
Composition of plan						
Active members	12,530	323	12,853	11,784	328	12,112
Deferred vested members	1,975	8	1,983	1,862	8	1,870
Retired members	9,291	822	10,113	8,935	938	9,873
At 31 December	**23,796**	**1,153**	**24,949**	**22,581**	**1,274**	**23,855**
Plans by geography						
Switzerland	11,683	–	11,683	11,129	–	11,129
United States	4,290	1,111	5,401	4,307	1,225	5,532
Germany	5,221	–	5,221	4,561	–	4,561
Rest of the World	2,602	42	2,644	2,584	49	2,633
At 31 December	**23,796**	**1,153**	**24,949**	**22,581**	**1,274**	**23,855**
Duration in years	15.9	12.7	15.8	16.0	12.8	15.8

Actuarial assumptions

The actuarial assumptions used in these financial statements are based on the requirements set out in IAS 19 'Employee Benefits'. They are unbiased and mutually compatible estimates of variables that determine the ultimate cost of providing post-employment benefits. They are set on an annual basis by local management, based on advice from actuaries, and are subject to approval by corporate management and the Group's actuaries. Actuarial assumptions consist of demographic assumptions on matters such as mortality and employee turnover, and financial assumptions on matters such as interest rates, salary and benefit levels, inflation rates and costs of medical benefits. The actuarial assumptions vary based upon local economic and social conditions. The actuarial assumptions used in the various statutory valuations may differ from these based on local legal and regulatory requirements.

Demographic assumptions. The most significant demographic assumptions relate to mortality rates. The Group's actuaries use mortality tables which take into account historic patterns and expected changes, such as further increases in longevity. Rates of employee turnover, disability and early retirement are based on historical behaviour. The average life expectancy assumed now for an individual at the age of 65 is as follows:

Defined benefit plans: average life expectancy at the age of 65 for major schemes in years

Country	Mortality table	Male 2020	Male 2019	Female 2020	Female 2019
Switzerland	BVG 2015 projected with CMI model	21.6	21.6	23.6	23.6
United States	Pri-2012 projected with MP-2019	22.0	22.2	23.4	23.7
Germany	Heubeck tables 2018 G projected with CMI model	20.3	19.4	23.8	22.7

The mortality assumptions used for the pension plans in Switzerland were based on BVG 2015 applying the Continuous Mortality Investigation ('CMI') model. A long-term rate of 1.25% (2019: 1.25%) was used for longevity improvements.

The Group used as mortality assumptions for the pension plans in Germany Heubeck tables 2018 G applying the CMI model with a long-term rate of 1.25% for longevity improvements (2019: 1.25%).

Financial assumptions. These are based on market expectations for the period over which the obligations are to be settled. The assumptions used in the actuarial valuations are shown below.

Defined benefit plans: financial actuarial assumptions

	2020 Weighted average	2020 Range	2019 Weighted average	2019 Range
Discount rates	0.82%	0.00% – 6.10%	1.20%	0.01% – 6.90%
Expected rates of salary increases	2.37%	0.00% – 4.50%	2.44%	0.00% – 4.50%
Expected rates of pension increases	0.55%	0.00% – 3.00%	0.49%	0.00% – 3.00%
Expected inflation rates	1.97%	1.25% – 3.50%	2.00%	1.25% – 3.50%
Immediate medical cost trend rate	5.63%	5.61% – 5.80%	6.09%	5.67% – 6.10%
Ultimate medical cost trend rate (in 2038)	4.35%	4.00% – 4.50%	4.49%	4.00% – 4.50%

Discount rates are determined with reference to interest rates on high-quality corporate bonds or government bonds in countries where there is not a deep market in corporate bonds. Expected rates of salary increases are based on expected inflation rates with an adjustment to reflect the Group's latest expectation of long-term real salary increases taking into account expected inflation rates, amongst other factors. Expected rates of pension increases are generally linked to the expected inflation rate or the funding status of the plan. Expected inflation rates are derived by looking at the level of inflation implied by the financial markets in conjunction with the economists' price inflation forecasts, historic price inflation as well as other economic variables and circumstances. Medical cost trend rates take into account the benefits set out in the plan terms and expected future changes in medical costs. Since the Group's major post-employment medical plans are for US employees, these rates are driven by developments in the US.

Sensitivity analysis. The measurement of the net defined benefit obligation is particularly sensitive to changes in the discount rate, inflation rate, expected mortality and medical cost trend rate assumptions. The following table summarises the impact of a change in those assumptions on the present value of the defined benefit obligation.

Defined benefit plans: sensitivity of defined benefit obligation to actuarial assumptions in millions of CHF

	2020	2019
Increase (decrease) in defined benefit obligation		
Life expectancy		
– 1 year increase	775	733
Discount rates		
– 0.25% increase	(942)	(894)
– 0.25% decrease	1,005	953
Expected inflation rates		
– 0.25% increase	264	251
– 0.25% decrease	(250)	(231)
Immediate medical cost trend rate		
– 1.00% increase	127	146
– 1.00% decrease	(107)	(120)

Each sensitivity analysis considers the change in one assumption at a time leaving the other assumptions unchanged. This approach shows the isolated effect of changing one individual assumption but does not take into account that some assumptions are related. The method used to carry out the sensitivity analysis is the same as in the prior year.

Cash flows

The Group incurred cash flows from its defined benefit plans as shown in the table below.

Defined benefit plans: cash flows in millions of CHF

	2020	2019
Employer contributions, net of reimbursements – funded plans	(410)	(493)
Benefits paid – unfunded plans	(191)	(183)
Total cash inflow (outflow)	**(601)**	**(676)**

Based on the most recent actuarial valuations, the Group expects that employer contributions for funded plans in 2021 will be approximately CHF 415 million, which includes an estimated CHF 10 million of additional voluntary contributions related to the Chugai benefit plans. Benefits paid for unfunded plans in 2021 are estimated to be approximately CHF 191 million, which mostly relate to the German defined benefit plans.

27. Equity compensation plans

The Group operates several equity compensation plans, including separate plans at Chugai. IFRS 2 'Share-based Payment' requires that the fair value of all equity compensation plan awards granted to employees be estimated at grant date and recorded as an expense over the vesting period.

Expenses for equity compensation plans in millions of CHF

	2020	2019
Cost of sales	110	103
Marketing and distribution	151	136
Research and development	300	233
General and administration	152	125
Total operating expenses	**713**	**597**
Equity compensation plans		
Roche Stock-settled Stock Appreciation Rights	131	119
Roche Restricted Stock Unit Plan	542	438
Roche Performance Share Plan	2	3
Roche Connect	27	26
Roche Option Plan	1	2
Bonus Stock Awards	7	6
Chugai plans	3	3
Total operating expenses	**713**	**597**
Of which		
– Equity-settled	713	597
– Cash-settled	–	–

Cash inflow (outflow) from equity compensation plans in millions of CHF

	2020	2019
Roche Option Plan exercises	28	78
Chugai plans' exercises	9	9
Roche Connect costs	(27)	(26)
Transactions in own equity	(2,136)	(1,008)
Total cash inflow (outflow) from equity-settled equity compensation plans, net of transactions in own equity	**(2,126)**	**(947)**

The net cash outflow from transactions in own equity mainly arises from sales and purchases of equity instruments which are held for the Group's potential conversion obligations that may arise from the Group's equity compensation plans (see Note 22).

Equity compensation plans

Roche Stock-settled Stock Appreciation Rights. The Group issues Stock-settled Stock Appreciation Rights (S-SARs) to certain directors, management and employees selected at the discretion of the Group. The S-SARs give employees the right to receive non-voting equity securities reflecting the value of any appreciation in the market price of the non-voting equity securities between the grant date and the exercise date. Under the Roche S-SAR Plan 180 million S-SARs will be available for issuance over a ten-year period, starting from 2013. The rights, which are non-tradable equity-settled awards, have a ten-year duration and vest on a phased basis over four years. Rights granted before 2019 have a seven-year duration and vest on a phased basis over three years.

Roche S-SARs – movement in number of rights outstanding

	2020 Number of rights (thousands)	2020 Weighted average exercise price (CHF)	2019 Number of rights (thousands)	2019 Weighted average exercise price (CHF)
Outstanding at 1 January	32,080	247.23	47,223	238.12
Granted	8,353	308.27	7,339	272.30
Forfeited	(847)	275.98	(1,701)	245.65
Exercised	(8,089)	244.74	(20,762)	235.58
Expired	(17)	216.71	(19)	158.15
Outstanding at 31 December	**31,480**	**263.31**	**32,080**	**247.23**
– of which exercisable	15,429	247.47	14,898	247.77

Roche S-SARs – terms of rights outstanding at 31 December 2020

Year of grant	Number outstanding (thousands)	Weighted average years remaining contractual life	Rights outstanding Weighted average exercise price (CHF)	Number exercisable (thousands)	Rights exercisable Weighted average exercise price (CHF)
2014	1,020	0.26	263.56	1,020	263.56
2015	1,890	1.26	256.61	1,890	256.61
2016	3,009	2.27	250.96	3,009	250.96
2017	4,360	3.27	251.34	4,360	251.34
2018	7,339	4.26	221.44	3,818	221.51
2019	5,976	8.28	272.40	1,199	272.54
2020	7,886	9.27	308.28	133	308.07
Total	**31,480**	**5.64**	**263.31**	**15,429**	**247.47**

Roche Restricted Stock Unit Plan. The Group issues Restricted Stock Units (RSUs) awards to certain directors, management and employees selected at the discretion of the Group. The RSUs, which are non-tradable, represent the right to receive non-voting equity securities. RSUs vest on a phased basis over four years, subject to performance conditions, if any. RSUs granted before 2019 vest after a three-year period. There are currently no performance conditions on outstanding RSUs at 31 December 2020. Under the Roche RSU Plan 20 million non-voting equity securities will be available for issuance over a ten-year period, starting from 2013. The Roche RSU Plan also includes a value adjustment which will be an amount equivalent to the sum of shareholder distributions made by the Group during the vesting period attributable to the number of non-voting equity securities for which an individual award has been granted.

Roche RSUs – movement in number of awards outstanding

	2020 Number of awards (thousands)	2019 Number of awards (thousands)
Outstanding at 1 January	4,162	3,503
Granted	2,022	2,287
Forfeited	(338)	(386)
Transferred to participants	(1,601)	(1,242)
Outstanding at 31 December	**4,245**	**4,162**
– of which vested and transferable	1	1

Roche Performance Share Plan. Before 2019 the Group offered future share and non-voting equity security awards (or, at the discretion of the Board of Directors, their cash equivalent) to certain directors and key senior managers. These are non-tradable equity-settled awards. Under this programme there remains one annual three-year cycle. The Roche Performance Share Plan (PSP) includes a value adjustment which is an amount equivalent to the sum of shareholder distributions made by the Group during the vesting period attributable to the number of shares or non-voting equity securities for which an individual award has been granted. The amount of shares or non-voting equity securities allocated depends upon the individual's salary level, the achievement of performance targets linked to the Group's Total Shareholder Return (shares and non-voting equity securities combined) relative to the Group's peers during the three-year period from the date of the grant, and the discretion of the Board of Directors. Each award granted will result in between zero and two shares or non-voting equity securities (before value adjustment), depending upon the achievement of the performance targets. In 2019 and 2020 no new PSP awards were granted.

Roche Performance Share Plan – terms of outstanding awards at 31 December 2020

	2018–2020
Number of awards outstanding (thousands)	28
Vesting period	3 years
Allocated to recipients in	Feb. 2021
Fair value per unit at grant (CHF)	238.35
Total fair value at grant (CHF millions)	**10**

Roche Connect. This programme enables all employees worldwide, except for those in the US and certain other countries, to make regular deductions from their salaries to purchase non-voting equity securities. It is administered by independent third parties. The Group contributes to the programme, which allows the employees to purchase non-voting equity securities at a discount (usually 20%). The administrator purchases the necessary non-voting equity securities directly from the market. At 31 December 2020 the administrator held 3.3 million non-voting equity securities (2019: 3.1 million). In 2020 the cost of the plan was CHF 27 million (2019: CHF 26 million).

Roche Option Plan. This programme is used in countries where S-SARs are not used. Awards under this plan give employees the right to purchase non-voting equity securities at an exercise price specified at the grant date. The options, which are non-tradable equity-settled awards, have a ten-year duration and vest on a phased basis over four years. Options granted before 2019 have a seven-year duration and vest on a phased basis over three years.

Roche Option Plan – movement in number of options outstanding

	2020		2019	
	Number of options (thousands)	Weighted average exercise price (CHF)	Number of options (thousands)	Weighted average exercise price (CHF)
Outstanding at 1 January	540	246.52	794	236.63
Granted	28	308.01	99	271.65
Forfeited	(8)	252.23	(15)	241.68
Exercised	(113)	243.69	(337)	231.03
Expired	(1)	214.00	(1)	157.50
Outstanding at 31 December	**446**	**251.14**	**540**	**246.52**
– of which exercisable	302	246.67	286	247.58

Roche Option Plan – terms of options outstanding at 31 December 2020

Year of grant	Number outstanding (thousands)	Weighted average years remaining contractual life	Options outstanding Weighted average exercise price (CHF)	Number exercisable (thousands)	Options exercisable Weighted average exercise price (CHF)
2014	25	0.25	263.20	25	263.20
2015	47	1.27	257.89	47	257.89
2016	54	2.27	250.10	54	250.10
2017	74	3.28	250.83	74	250.83
2018	134	4.27	222.37	81	222.47
2019	85	8.25	271.65	21	271.65
2020	27	9.25	308.01	0	308.01
Total	**446**	**4.40**	**251.14**	**302**	**246.67**

The weighted average share price of Roche non-voting equity securities during the year was CHF 321.93 (2019: CHF 276.84).

Bonus Stock Awards. The Chairman of the Board of Directors and the Chief Executive Officer will be granted Bonus Stock Awards in lieu of their cash-settled bonus for the financial year 2020. These are subject to approval by the 2021 Annual General Meeting in March 2021 and will be issued in March 2021. The number of awards and fair value per award will be calculated at the grant date.

Fair value measurement

The inputs used in the measurement of the fair values at grant date of the equity compensation plans were as follows:

Fair value measurement in 2020

	Roche Stock-settled Stock Appreciation Rights	Roche Restricted Stock Unit Plan	Roche Option Plan
Vesting period	Progressively over 4 years	Progressively over 4 years	Progressively over 4 years
Contractual life	10 years	n/a	10 years
Number granted during year (thousands)	8,353	2,022	28
Weighted average fair value (CHF)	20	308	20
Model used	Binomial	Market price[a)]	Binomial
Inputs to option pricing model			
– Share price at grant date (CHF)	308	308	308
– Exercise price (CHF)	308	–	308
– Expected volatility[b)]	19.2%	n/a	19.2%
– Expected dividend yield	7.0%	n/a	7.0%
– Early exercise factor[c)]	1.31	n/a	1.31
– Expected exit rate	8.5%	n/a	8.5%

a) The fair value of the Roche RSUs is equivalent to the share price on the date of grant.
b) Volatility was determined primarily by reference to historically observed prices of the underlying equity. Risk-free interest rates are derived from zero coupon swap rates at the grant date taken from Datastream.
c) The early exercise factor describes the ratio between the expected market price at the exercise date and the exercise price at which early exercises can be expected, based on historically observed behaviour.

28. Leases

Implementation of IFRS 16 'Leases'

Effective 1 January 2019 the Group implemented IFRS 16 'Leases'. IFRS 16 replaced existing leases guidance, including IAS 17 'Leases', and sets out the principles for recognition and measurement of leases.

The main effect on the Group as a lessee was that IFRS 16 introduced a single, on-balance sheet lease accounting model. It requires a lessee to recognise assets and liabilities for its leases. The lease liability reflects the present value of the remaining lease payments, and the right-of-use asset corresponds to the lease liability, adjusted for payments made before the lease commencement date, lease incentives and other items related to the lease agreement. As a result, right-of-use assets totalling CHF 1,162 million and lease liabilities totalling CHF 1,194 million were recorded on the balance sheet effective 1 January 2019.

All transition impacts on the balance sheet are shown in the table below.

Transition impact of IFRS 16 on Roche Group consolidated balance sheet (selected items) in millions of CHF

	As originally published for 31 December 2018	Application of IFRS 16	Revised for 1 January 2019
Property, plant and equipment [8]	21,818	(3)	21,815
Right-of-use assets	–	1,162	1,162
Other current assets	2,521	(24)	2,497
Long-term debt [21]	(16,077)	2	(16,075)
Non-current provisions [20]	(1,452)	16	(1,436)
Other non-current liabilities	(188)	(839)	(1,027)
Short-term debt [21]	(2,693)	2	(2,691)
Current provisions [20]	(2,329)	6	(2,323)
Other current liabilities	(10,677)	(326)	(11,003)
Total net assets	**30,366**	**(4)**	**30,362**
Capital and reserves attributable to Roche shareholders [22]	27,622	(4)	27,618
Equity attributable to non-controlling interests [24]	2,744	0	2,744
Total equity	**30,366**	**(4)**	**30,362**

The weighted average incremental borrowing rate applied to lease liabilities recognised on transition was 1.49%.

The operating lease commitments and finance lease liabilities reported in the 2018 Annual Financial Statements, applying the previous leasing standard IAS 17, can be reconciled to the lease liabilities recognised on transition to IFRS 16 as shown in the table below.

Reconciliation of lease liabilities recognised on transition on 1 January 2019 in millions of CHF

Operating lease commitments (undiscounted) as reported at 31 December 2018 applying IAS 17	1,330
Finance lease liabilities as reported at 31 December 2018 applying IAS 17	4
Recognition exemption for short-term leases and leases of low-value assets	(57)
Lease arrangements with commencement date after 31 December 2018	(89)
Discounting	(56)
Other	62
Lease liabilities recognised on transition on 1 January 2019 applying IFRS 16	**1,194**
Thereof	
– Other non-current liabilities [18]	865
– Other current liabilities [19]	329
Total	**1,194**

For the Group as a lessor the application of the new standard did not have any material effects.

Transition approach and use of practical expedients. The Group applied the cumulative catch-up method for the transition. The cumulative effect of adopting IFRS 16 was recognised as an adjustment to the opening balance of retained earnings at 1 January 2019, with no restatement of comparative information. Right-of-use assets were generally measured at an amount equal to the lease liability, adjusted for payments made before the lease commencement date, lease incentives and other items related to the lease agreement that were recognised on the balance sheet immediately before the date of initial application. Some right-of-use assets were measured at their carrying amount as if IFRS 16 had been applied since the lease commencement date, but discounted using the Group's incremental borrowing rate at 1 January 2019. Some practical expedients permitted by the standard were used, notably:

- To not reassess upon transition whether an existing contract contains a lease. The definition of a lease under IFRS 16 was applied only to contracts entered into or changed on or after 1 January 2019.
- The recognition exemptions for short-term leases and leases of low-value assets.
- For motor vehicles to not separate non-lease components and instead to account for the lease and non-lease components as a single lease component.
- To apply IAS 37 for onerous leases instead of performing an impairment review.

The Group as a lessee

The Group enters into leasing transaction as a lessee mainly for reasons of convenience and flexibility. The Group has good cash generation ability and it enjoys strong long-term investment grade credit ratings. Therefore it typically does not enter into leasing arrangements for financing considerations. The main areas of leases that the Group has entered into are for:

- Property – offices and apartments. These are a small number of leases, but represent most of the value.
- Cars – mostly for sales representatives.
- Office equipment – photocopiers and similar.

The right-of-use assets reported for the Group's leases are shown in the table below.

Right-of-use assets: movements in carrying value of assets in millions of CHF

	Land	Buildings and land improvements	Machinery and equipment	Total
Year ended 31 December 2019				
At 1 January 2019	–	–	–	–
Cumulative catch-up for previously reported operating leases on implementation of IFRS 16	45	928	186	1,159
Reclassification from property, plant and equipment of previously reported finance leases on implementation of IFRS 16 [8]	–	–	3	3
At 1 January 2019 (revised)	**45**	**928**	**189**	**1,162**
Business combinations [6]	0	65	0	65
Additions	5	292	111	408
Disposals	0	(43)	(22)	(65)
Depreciation	(3)	(255)	(93)	(351)
Impairment reversal (charge)	0	12	0	12
Other	0	(56)	(14)	(70)
Currency translation effects	(1)	(13)	(2)	(16)
At 31 December 2019	**46**	**930**	**169**	**1,145**
Cost	49	1,168	252	1,469
Accumulated depreciation and impairment	(3)	(238)	(83)	(324)
Net book value	**46**	**930**	**169**	**1,145**
Year ended 31 December 2020				
At 1 January 2020	46	930	169	1,145
Business combinations	0	0	0	0
Asset acquisitions	0	1	0	1
Additions	0	360	110	470
Disposals	0	(42)	(14)	(56)
Depreciation	(3)	(266)	(88)	(357)
Impairment reversal (charge)	0	(5)	0	(5)
Other	0	(16)	0	(16)
Currency translation effects	(1)	(58)	(11)	(70)
At 31 December 2020	**42**	**904**	**166**	**1,112**
Cost	47	1,340	292	1,679
Accumulated depreciation and impairment	(5)	(436)	(126)	(567)
Net book value	**42**	**904**	**166**	**1,112**

Classification of impairment reversal (charge) of right-of-use assets in millions of CHF

	2020	2019
Cost of sales	(1)	0
Marketing and distribution	0	0
Research and development	(1)	0
General and administration	(3)	12
Total impairment reversal (charge)	**(5)**	**12**

In 2020 impairment charges for right-of-use assets were mainly related to global restructuring plans (see Note 7).
In 2019 an income of CHF 12 million was recognised which related to an impairment reversal of right-of-use assets from a lease arrangement assessed to be an onerous contract in 2018.

Liabilities reported for the Group's leases are shown in the table below.

Leases: movements in carrying value of recognised liabilities in millions of CHF

	2020	2019
At 1 January	1,219	–
Cumulative catch-up for previously reported operating leases on implementation of IFRS 16	n/a	1,190
Reclassification from debt of previously reported finance lease obligations on implementation of IFRS 16 [21]	n/a	4
At 1 January (revised)	**1,219**	**1,194**
Increase from new lease arrangements	469	399
Repayment of lease liabilities	(387)	(388)
Business combinations	0	86
Asset acquisitions	1	0
Disposals	(70)	(71)
Interest expense on lease liabilities [4]	18	18
Other	19	(1)
Currency translation effects	(74)	(18)
At 31 December	**1,195**	**1,219**
Non-current lease liabilities [18]	876	879
Current lease liabilities [19]	319	340
Total lease liabilities	**1,195**	**1,219**

The maturity analysis of lease liabilities is given in Note 31 in the 'Liquidity risk' section.

Short-term leases and leases of low-value assets are accounted for using the recognition exemption permitted by IFRS 16. Expenses for short-term leases are recognised on a straight-line basis. These mainly include short-term property leases for employee apartments. The amount reported in 2020 was CHF 43 million (2019: CHF 55 million). Expenses for leases of low-value assets are recognised on a straight-line basis. These mainly include certain office equipment. The amount reported in 2020 was CHF 17 million (2019: CHF 22 million).

Expenses for variable lease payments not included in the measurement of lease liabilities was CHF 34 million in 2020 (2019: CHF 45 million). Income from subleasing right-of-use assets was CHF 8 million in 2020 (2019: CHF 10 million). In 2020 and 2019 the Group did not enter into any sale and leaseback transactions.

The major cash flows in respect of leases where the Group is the lessee are shown in the table below.

Leases: cash flows in millions of CHF

	2020	2019
Included in cash flows from operating activities	(94)	(122)
Included in cash flows from financing activities	(387)	(390)
Total lease payments	**(481)**	**(512)**

Cash flows from operating activities include cash flows from short-term lease, leases of low-value assets and variable lease payments. Cash flows from financing activities include the payment of interest and the principal portion of lease liabilities as well as prepayments made before the lease commencement date.

Leases committed and not yet commenced. In July 2019 Foundation Medicine, Inc. ('FMI') entered into a binding lease agreement with a third party for the lease of laboratory and office space in a building in Boston, US, which is to be constructed by the landlord at the location currently known as 'Boston Seaport'. According to the agreement FMI is committed to lease the building for 15 years. The commencement date of the lease is currently expected to be in the second half of 2022. The initial right-of-use asset and lease liability related to this agreement are estimated to be approximately USD 670 million based on current assumptions.

The Group as a lessor

In the Diagnostics Division the Group enters into certain contracts which include placement of diagnostics instruments, supply of reagents and other consumables, and servicing arrangements. Depending upon the term of the agreement, the instrument placement may result in either a finance lease or an operating lease. The Group performs a thorough customer assessment before new leasing agreements are signed. Usually the Group also retains rights to terminate or modify contracts if certain conditions are not met.

Finance leases. Certain assets, mainly diagnostics instruments, are leased to third parties through finance lease arrangements. Such assets are reported as receivables at an amount equal to the net investment in the lease. Income from finance leases is recognised as revenue at amounts that represent the fair value of the instrument, which approximates the present value of the minimum lease payments under the arrangement. Finance income for finance lease arrangements longer than twelve months is deferred and subsequently recognised based on a pattern that approximates the use of the effective interest method and recorded in royalty and other operating income.

The following amounts were recorded as income in respect of finance leases.

Finance leases: selected items of income in millions of CHF

	2020	2019
Selling profit as the difference between sales and cost of sales	7	3
Finance income on the net investment in the lease	6	6

Currently the Group does not have any income from the variable lease payments of finance leases. The carrying amount of the net investment in finance leases reported as receivables was CHF 134 million (2019: CHF 146 million).

Finance leases: future minimum lease receipts under non-cancellable leases in millions of CHF

	Gross investment in lease		Present value of minimum lease receipts	
	2020	2019	2020	2019
Within one year	60	71	54	64
Between one and two years	32	45	29	42
Between two and three years	25	19	23	17
Between three and four years	15	13	14	12
Between four and five years	10	7	9	6
More than five years	5	4	4	4
Total	**147**	**159**	**133**	**145**
Unearned finance income	(13)	(13)	n/a	n/a
Unguaranteed residual value	n/a	n/a	1	1
Net investment in lease	**134**	**146**	**134**	**146**

Operating leases. Certain assets, mainly diagnostics instruments, are leased to third parties through operating lease arrangements. Income from operating leases is recognised as revenue on a straight-line basis over the lease term or, when lease revenue is entirely based on variable lease payments and subject to subsequent reagent sales, as the performance obligations for reagents are satisfied.

Lease income in 2020 was CHF 788 million (2019: CHF 782 million) and was included in sales. Of this CHF 596 million (2019: CHF 583 million) relates to variable lease payments not depending upon an index or rate.

Leased assets are reported within property, plant and equipment, as shown in the table below.

Machinery and equipment subject to operating leases: movements in carrying value of assets in millions of CHF

	2020			2019		
	Leased out	Own use	Total	Leased out	Own use	Total
At 1 January						
Cost	5,458	15,731	21,189	5,161	15,276	20,437
Accumulated depreciation and impairment	(3,697)	(10,192)	(13,889)	(3,463)	(9,840)	(13,303)
Net book value	**1,761**	**5,539**	**7,300**	**1,698**	**5,436**	**7,134**
Year ended 31 December						
At 1 January	1,761	5,539	7,300	1,698	5,436	7,134
Reclassification to right-of-use assets on implementation of IFRS 16 'Leases' [8]	n/a	n/a	n/a	0	(3)	(3)
At 1 January (revised)	**1,761**	**5,539**	**7,300**	**1,698**	**5,433**	**7,131**
Business combinations	0	0	0	0	18	18
Asset acquisitions	0	1	1	0	0	0
Additions	739	308	1,047	836	243	1,079
Disposals	(45)	(37)	(82)	(47)	(40)	(87)
Transfers	1	1,108	1,109	0	1,031	1,031
Depreciation charge	(668)	(980)	(1,648)	(673)	(972)	(1,645)
Impairment reversal (charge)	0	35	35	(1)	(23)	(24)
Other	16	(245)	(229)	1	(63)	(62)
Currency translation effects	(123)	(222)	(345)	(53)	(88)	(141)
At 31 December	**1,681**	**5,507**	**7,188**	**1,761**	**5,539**	**7,300**
Cost	5,508	15,619	21,127	5,458	15,731	21,189
Accumulated depreciation and impairment	(3,827)	(10,112)	(13,939)	(3,697)	(10,192)	(13,889)
Net book value	**1,681**	**5,507**	**7,188**	**1,761**	**5,539**	**7,300**

The undiscounted amounts expected to be received from non-cancellable operating leases are shown in the table below.

Operating leases: future minimum lease receipts under non-cancellable leases in millions of CHF

	2020	2019
Within one year	165	173
Between one and two years	116	116
Between two and three years	80	82
Between three and four years	49	50
Between four and five years	26	25
More than five years	12	14
Total minimum receipts	**448**	**460**

29. Earnings per share and non-voting equity security

Basic earnings per share and non-voting equity security

	2020	2019
Net income attributable to Roche shareholders (CHF millions)	**14,295**	**13,497**
Number of shares (millions)[22]	160	160
Number of non-voting equity securities (millions)[22]	703	703
Weighted average number of own shares and non-voting equity securities held (millions)	(8)	(7)
Weighted average number of shares and non-voting equity securities in issue used to calculate basic earnings per share (millions)	**855**	**856**
Basic earnings per share and non-voting equity security (CHF)	**16.73**	**15.77**

Diluted earnings per share and non-voting equity security

	2020	2019
Net income attributable to Roche shareholders (CHF millions)	14,295	13,497
Increase in non-controlling interests' share of Group net income, assuming all outstanding Chugai stock options exercised (CHF millions)	(1)	(2)
Net income used to calculate diluted earnings per share (CHF millions)	**14,294**	**13,495**
Weighted average number of shares and non-voting equity securities in issue (millions)	855	856
Adjustment for assumed exercise of equity compensation plans, where dilutive (millions)	10	8
Weighted average number of shares and non-voting equity securities in issue used to calculate diluted earnings per share (millions)	**865**	**864**
Diluted earnings per share and non-voting equity security (CHF)	**16.52**	**15.62**

30. Statement of cash flows

Cash flows from operating activities

Cash flows from operating activities arise from the Group's primary activities in the Pharmaceuticals and Diagnostics Divisions. These are calculated using the indirect method by adjusting the Group's operating profit for any operating income and expenses that are not cash flows (for example depreciation, amortisation and impairment) in order to derive the cash generated from operations. This and other operating cash flows are shown in the statement of cash flows. Operating cash flows also include income taxes paid on all activities.

Cash generated from operations in millions of CHF

	2020	2019
Net income	15,068	14,108
Add back non-operating (income) expense		
– Financing costs [4]	553	993
– Other financial (income) expense [4]	25	(59)
– Income taxes [5]	2,897	2,506
Operating profit	**18,543**	**17,548**
Depreciation of property, plant and equipment [8]	2,451	2,409
Depreciation of right-of-use assets [28]	357	351
Amortisation of intangible assets [10]	1,750	1,532
Impairment of goodwill [9]	247	779
Impairment of intangible assets [10]	425	977
Impairment (reversal) of property, plant and equipment [8]	(26)	261
Impairment (reversal) of right-of-use assets [28]	5	(12)
Operating (income) expense for defined benefit plans [26]	656	598
Operating expense for equity-settled equity compensation plans [27]	713	597
Net (income) expense for provisions	459	1,685
Bad debt (reversal) expense	54	33
Inventory write-downs	257	558
Net (gain) loss on disposal of products	(239)	(490)
Other adjustments	(38)	(33)
Cash generated from operations	**25,614**	**26,793**

Cash flows from investing activities

Cash flows from investing activities are principally those arising from the Group's investments in property, plant and equipment and intangible assets, and from the acquisition and divestment of subsidiaries, associates and businesses. Cash flows connected with the Group's portfolio of marketable securities and other investments are also included, as are any interest and dividend payments received in respect of these securities and investments. These cash flows indicate the Group's net reinvestment in its operating assets and the cash flow effects of business combinations and divestments, as well as the cash generated by the Group's other investments.

Interest and dividends received in millions of CHF

	2020	2019
Interest received	16	68
Dividends received	0	1
Total	**16**	**69**

Cash flows from financing activities

Cash flows from financing activities are primarily the proceeds from the issue and repayment of the Group's equity and debt instruments. They also include interest payments and dividend payments on these instruments. Cash flows from short-term financing are also included. These cash flows indicate the Group's transactions with the providers of its equity and debt financing. Cash flows from lease payments are also included within financing activities. Cash flows from short-term borrowings are shown as a net movement, as these consist of a large number of transactions with short maturity.

Dividends paid in millions of CHF

	2020	2019
Dividends to Roche Group shareholders	(7,700)	(7,449)
Dividends to non-controlling shareholders		
– Chugai	(312)	(199)
– Other non-controlling interests	(18)	(14)
Dividend withholding tax	66	(20)
Total	**(7,964)**	**(7,682)**

Liabilities arising from financing activities

Movements in carrying value of recognised assets (liabilities) in millions of CHF

	Debt [21]	Interest payable [19]	Principal portion of lease liabilities	Derivative financial instruments, net [16, 19, 31]	Cash collateral receivables (payables), net [16, 19, 31]	Total
Year ended 31 December 2019						
At 1 January 2019	(18,766)	(221)	(1,194)	(15)	6	(20,190)
Cash flows						
– Outflow (inflow)	4,403	624	372	(13)	150	5,536
Non-cash changes						
– Financing costs	(211)	(590)	(18)	0	0	(819)
– Business combinations	(1)	0	(86)	0	0	(87)
– Fair value and other	(23)	9	(310)	(61)	(1)	(386)
– Foreign exchange rates	235	2	17	1	(7)	248
At 31 December 2019	**(14,363)**	**(176)**	**(1,219)**	**(88)**	**148**	**(15,698)**
Year ended 31 December 2020						
At 1 January 2020	(14,363)	(176)	(1,219)	(88)	148	(15,698)
Cash flows						
– Outflow (inflow)	(659)	422	369	(257)	(300)	(425)
Non-cash changes						
– Financing costs	(9)	(411)	(18)	0	0	(438)
– Business combinations	0	0	0	0	0	0
– Asset acquisitions	(10)	0	(1)	0	0	(11)
– Fair value and other	(1)	(8)	(399)	455	0	47
– Foreign exchange rates	826	13	75	2	(9)	907
At 31 December 2020	**(14,216)**	**(160)**	**(1,193)**	**112**	**(161)**	**(15,618)**

Significant non-cash transactions

In 2020 there were no significant non-cash transactions (2019: none) except for the leasing transactions where the Group is a lessee (see Note 28).

31. Risk management

Group risk management

Risk management is a fundamental element of the Group's business practice on all levels and encompasses different types of risks. At Group level, risk management is an integral part of the long-term forecasting and controlling processes. Material risks are monitored and regularly discussed with the Corporate Executive Committee and the Audit Committee of the Board of Directors.

Financial risk management

The Group is exposed to various financial risks arising from its underlying operations and corporate finance activities. The Group's financial risk exposures are predominantly related to changes in foreign exchange rates, interest rates and equity prices as well as the creditworthiness and the solvency of the Group's counterparties.

Financial risk management within the Group is governed by policies reviewed by the boards of directors of Roche and Chugai as appropriate to their areas of statutory responsibility. These policies cover credit risk, liquidity risk and market risk. The policies provide guidance on risk limits, types of authorised financial instruments and monitoring procedures. As a general principle, the policies prohibit the use of derivative financial instruments for speculative trading purposes. Policy implementation and day-to-day risk management are carried out by the relevant treasury functions and regular reporting on these risks is performed by the relevant accounting and controlling functions within Roche and Chugai.

Credit risk

Credit risk arises from the possibility that counterparties to transactions may default on their obligations, causing financial losses for the Group. The objective of managing counterparty credit risk is to prevent losses of liquid funds deposited with or invested in such counterparties. The maximum exposure to credit risk resulting from financial activities, without considering netting agreements and without taking account of any collateral held or other credit enhancements, is equal to the carrying value of the Group's financial assets.

The Group considers a financial asset to be in default when the counterparty is unlikely to pay its obligations to the Group in full. In assessing whether a counterparty is in default, the Group considers both qualitative and quantitative indicators (e.g. overdue status) that are based on data developed internally and for certain financial assets are also obtained from external sources. A major part of the Group's receivables which are past due more than 90 days relate to public customers. Risk of default of public customers is considered low. The Group has reasonable and supportable information to demonstrate that a more lagging default criterion is more appropriate for this particular customer segment.

Accounts receivable. At 31 December 2020 the Group has trade receivables of CHF 11.0 billion (2019: CHF 11.3 billion). These are subject to a policy of active credit risk management which focuses on the assessment of country risk, credit availability, ongoing credit evaluation and account monitoring procedures. The objective of trade receivables management is to maximise the collection of unpaid amounts.

The Group uses an allowance matrix to estimate the allowance for doubtful accounts for all trade receivables. The expected credit loss ('ECL') rate is based on the Group's historical experience and the Group's expectation of economic conditions over the period until receivables are expected to be paid.

Customer credit risk exposure based on accounts receivable days overdue in millions of CHF

	Total	Current	Overdue 1–3 months	Overdue 3–12 months	Overdue more than 1 year	Credit impaired
At 31 December 2020						
Gross carrying amount	10,669	8,774	864	432	541	58
Group's expected credit loss rate	5%	0%	2%	7%	70%	100%
Allowance for doubtful accounts	(515)	(31)	(16)	(29)	(381)	(58)
At 31 December 2019						
Gross carrying amount	10,972	8,739	1,084	490	612	47
Group's expected credit loss rate	5%	0%	1%	6%	68%	100%
Allowance for doubtful accounts	(532)	(29)	(13)	(27)	(416)	(47)

At 31 December 2020 the Group's combined trade receivables balance with three US national wholesale distributors, McKesson Corp., AmerisourceBergen Corp. and Cardinal Health, Inc., was equivalent to CHF 2.7 billion representing 25% of the Group's consolidated trade receivables (2019: CHF 2.9 billion representing 26%). There is no other significant concentration of counterparty credit risk due to the Group's large number of customers and their wide geographical spread. Risk limits and exposures are continuously monitored by country and by the nature of counterparties. The Group obtains credit insurance and similar enhancements when appropriate to protect the collection of trade receivables. At 31 December 2020 no collateral was considered to measure expected credit losses for trade receivables (2019: none).

Since 2010 there have been financial difficulties in Southern European countries, notably Spain, Italy, Greece and Portugal. The Group is a leading supplier to the healthcare sectors in these countries and has trade receivables of CHF 0.7 billion (2019: CHF 0.8 billion) with the public and private customers in these countries. The Group uses different measures to improve collections in these countries, including intense communication with customers, factoring, negotiations of payment plans, charging of interest for late payments, and legal actions.

The nature and geographic location of counterparties to accounts receivable that are not overdue or impaired are shown in the table below. These include the balances with US national wholesalers and Southern Europe public customers described above.

Accounts receivable (not overdue), net of allowances for doubtful accounts and other allowances: nature and geographical location of counterparties in millions of CHF

	2020				2019			
Regions	Total	Public	Wholesalers/ distributors	Private	Total	Public	Wholesalers/ distributors	Private
Switzerland	137	24	95	18	139	22	78	39
Europe	1,730	720	377	633	1,560	668	379	513
North America	3,318	70	3,237	11	3,413	91	3,313	9
Latin America	486	180	149	157	584	173	226	185
Japan	1,149	5	1,129	15	1,100	1	1,076	23
Asia, Australia and Oceania	1,407	262	958	187	1,474	200	1,029	245
Rest of the World	516	137	196	183	440	5	229	206
Total	**8,743**	**1,398**	**6,141**	**1,204**	**8,710**	**1,160**	**6,330**	**1,220**

Cash and marketable securities (excluding equity securities). At 31 December 2020 the Group has cash and marketable securities (excluding equity securities) of CHF 12.3 billion (2019: CHF 11.8 billion). These are subject to a policy of restricting exposures to high-quality counterparties and setting defined limits for individual counterparties. These limits and counterparty credit ratings are reviewed regularly.

Cash and cash equivalents are held with banks and financial institutions, which are predominantly rated as investment grade (96% in both 2020 and 2019), based on Moody's and Standard & Poor's ratings. Cash and short-term time deposits are subject to rules which limit the Group's exposure to individual financial institutions.

Impairment on cash and cash equivalents is measured on a 12-month expected credit losses ('ECL') basis with a reference to external credit ratings of the counterparties, and reflect the short maturities of the exposures. The Group considers that its cash and cash equivalents have low credit risk based on these external credit ratings.

Investments in marketable securities (excluding equity securities) are entered into on the basis of guidelines with regard to liquidity, quality and maximum amount. As a general rule, the Group invests only in high-quality securities with adequate liquidity and with counterparties that have a credit rating of at least Baa3 from Moody's and BBB- from Standard & Poor's.

The credit risk of the counterparties with external ratings below investment grade or with no rating is closely monitored and reviewed on an individual basis.

Rating analysis of cash and marketable securities (excluding equity securities) – market values in millions of CHF

	2020			2019		
	Total	Fair value through OCI (12-month ECL)	Amortised costs (12-month ECL)	Total	Fair value through OCI (12-month ECL)	Amortised costs (12-month ECL)
AAA range	1,269	640	629	581	382	199
AA range	2,225	827	1,398	1,489	95	1,394
A range	8,133	1,472	6,661	8,976	1,673	7,303
BBB range	453	378	75	535	141	394
Total investment grade	**12,080**	**3,317**	**8,763**	**11,581**	**2,291**	**9,290**
Below BBB range (below investment grade)	134	7	127	97	7	90
Unrated	109	0	109	167	0	167
Total gross carrying amounts	**12,323**	**3,324**	**8,999**	**11,845**	**2,298**	**9,547**
Loss allowance [a]	**1**	**0**	**1**	**1**	**0**	**1**

a) The loss allowance related to fair value through OCI does not affect the carrying amount of marketable securities (excluding equity securities) but is booked against corresponding OCI reserve instead.

Debt securities at amortised cost and those at fair value through OCI are investment grade and therefore considered to be low risk, and thus the impairment allowance is determined at 12-month expected credit losses ('ECL') with a reference to external credit ratings of the counterparties. There were no debt securities for which the Group observed a significant increase in the credit risk which would require the application of the lifetime expected credit losses impairment model. In addition, there were no material movements in the loss allowance in 2020 and 2019, respectively.

Master netting agreements. The Group enters into derivative transactions and collateral agreements under International Swaps and Derivatives Association (ISDA) master netting agreements with the respective counterparties in order to mitigate counterparty risk. Under such agreements the amounts owed by each counterparty on a single day in respect of all transactions outstanding in the same currency are aggregated into a single net amount that is payable by one party to the other. The ISDA agreements do not meet the criteria for offsetting in the balance sheet as the Group does not have a currently enforceable right to offset recognised amounts, because the right to offset is only enforceable on the occurrence of future events, such as a default or other credit events.

Contract terms. At 31 December 2020 there are no significant financial assets whose terms have been renegotiated (2019: none).

Impairment losses on financial assets excluding equity investments/securities. During 2020 there were no impairment losses (2019: none).

Liquidity risk

Liquidity risk arises through a surplus of financial obligations over available financial assets due at any point in time. The Group's approach to liquidity risk is to maintain sufficient readily available reserves in order to meet its liquidity requirements at any point in time. Roche and Chugai enjoy strong credit quality and are rated by at least one major credit rating agency. The ratings will permit efficient access to the international capital markets in the event of major financing requirements. At 31 December 2020 the Group has an unused committed credit line with various financial institutions totalling CHF 7.0 billion (2019: CHF 7.6 billion), of which CHF 6.6 billion (2019: CHF 7.3 billion) serve as a back-stop line for the commercial paper program. On 3 July 2019 the previously existing committed credit lines were refinanced by one new committed credit line with an initial maturity of five years.

The remaining undiscounted cash flow contractual maturities of financial liabilities, including estimated interest payments, are shown in the table below.

Contractual maturities of financial liabilities in millions of CHF

	Carrying value	Total	Less than 1 year	1–2 years	2–5 years	Over 5 years
At 31 December 2020						
Debt [21]						
– Bonds and notes	12,024	14,977	2,194	1,319	5,081	6,383
– Other debt	2,192	2,192	2,192	0	0	0
Contingent consideration [20]	150	159	46	0	105	8
Accounts payable [17]	4,121	4,121	4,121	–	–	–
Other non-current liabilities [18]	1,107	1,147	–	455	372	320
– *of which lease liabilities*	*876*	*916*	–	*252*	*362*	*302*
Other current liabilities [19]	11,769	11,785	11,766	19	0	0
– *of which lease liabilities*	*319*	*335*	*335*	–	–	–
– *of which derivative financial instruments*	*286*	*286*	*267*	*19*	*0*	*0*
Total financial liabilities	**31,363**	**34,381**	**20,319**	**1,793**	**5,558**	**6,711**
At 31 December 2019						
Debt [21]						
– Bonds and notes	12,666	16,228	371	2,234	4,389	9,234
– Other debt	1,697	1,697	1,695	2	0	0
Contingent consideration [20]	205	231	18	31	157	25
Accounts payable [17]	3,822	3,822	3,822	–	–	–
Other non-current liabilities [18]	1,144	1,209	–	496	406	307
– *of which lease liabilities*	*879*	*944*	–	*268*	*388*	*288*
Other current liabilities [19]	11,879	11,911	11,792	119	0	0
– *of which lease liabilities*	*340*	*372*	*372*	–	–	–
– *of which derivative financial instruments*	*266*	*266*	*147*	*119*	*0*	*0*
Total financial liabilities	**31,413**	**35,098**	**17,698**	**2,882**	**4,952**	**9,566**

Take-or-pay commitments. The Group has entered into contract manufacturing agreements with various companies to further develop manufacturing capacity and flexibility, mainly in the Pharmaceuticals Division. There are future minimum take-or-pay commitments within some of these agreements with a total potential commitment from the Group of CHF 1.5 billion at 31 December 2020 (2019: CHF 1.4 billion).

Market risk

Market risk arises from changing market prices, mainly foreign exchange rates and interest rates, of the Group's financial assets or financial liabilities which affect the Group's financial result and equity.

Value-at-Risk. The Group uses Value-at-Risk (VaR) to measure the impact of market risk on its financial instruments. VaR indicates the value range within which a given financial instrument will fluctuate with a pre-set probability as a result of movements in market prices. VaR is calculated using a historical simulation approach and for each scenario, all financial instruments are fully valued and the total change in value and earnings is determined. VaR calculations are based on a 95% confidence level and a holding period of 20 trading days over the past ten years. This holding period reflects the time required to change the corresponding risk exposure, should this be deemed appropriate.

Actual future gains and losses associated with our treasury activities may differ materially from the VaR analyses due to the inherent limitations associated with predicting the timing and amount of changes to interest rates, foreign exchange rates and equity investment prices, particularly in periods of high market volatilities. Furthermore, VaR does not include the effect of changes in credit spreads.

Market risk of financial instruments in millions of CHF

	2020	2019
VaR – Interest rate component	107	158
VaR – Foreign exchange component	21	44
VaR – Other price component	59	34
Diversification	(55)	(72)
VaR – Total market risk	**132**	**164**

The interest rate component decreased due to the reduction in the underlying interest rates across major currencies. The foreign exchange component decreased due to a favourable exposure mix. The other price component increased mainly due to higher prices of equity investments and equity securities.

Foreign exchange risk

The Group uses the Swiss franc as its reporting currency and as a result is exposed to movements in foreign currencies, mainly the US dollar, Japanese yen and euro. The Group's foreign exchange risk management strategy is to preserve the economic value of its current and future assets and to minimise the volatility of the Group's financial result. The primary focus of the Group's foreign exchange risk management activities is on hedging transaction exposures arising through foreign currency flows or monetary positions held in foreign currencies. The Group uses forward contracts, foreign exchange options and cross-currency swaps to hedge transaction exposures. Application of these instruments intends to continuously immunise against unfavourable developments of foreign exchange rates.

Interest rate risk

The Group mainly raises debt on a fixed rate basis for bonds and notes. The Group is exposed to movements in interest rates, mainly for its US dollar, Swiss franc and euro floating rate financial instruments and short-term debt. The Group's interest rate risk management strategy is to optimise the net interest result. The Group may use forward contracts, options and interest rate swaps to hedge its interest rate exposures. Depending on the interest rate environment of major currencies, the Group will use these instruments to generate an appropriate mix of fixed and floating rate exposures.

Other price risk

Other price risk arises mainly from movements in the prices of equity securities. The Group manages the price risk through placing limits on individual and total equity investments. These limits are defined both as a percentage of total liquid funds and as an absolute number for individual equity investments.

Capital management

The Group defines the capital that it manages as the Group's total capitalisation, being the sum of debt plus equity, including non-controlling interests. The Group's objectives when managing capital are:

- To safeguard the Group's ability to continue as a going concern, so that it can continue to provide benefits for patients and returns to investors.
- To provide an adequate return to investors based on the level of risk undertaken.
- To have available the necessary financial resources to allow the Group to invest in areas that may deliver future benefits for patients and returns to investors.
- To maintain sufficient financial resources to mitigate against risks and unforeseen events.

The capitalisation is reported to senior management as part of the Group's regular internal management reporting and is shown in the table below.

Capital in millions of CHF

	2020	2019	2018
Capital and reserves attributable to Roche shareholders [22]	36,341	32,747	27,622
Equity attributable to non-controlling interests [24]	3,432	3,120	2,744
Total equity	**39,773**	**35,867**	**30,366**
Total debt [21]	**14,216**	**14,363**	**18,770**
Capitalisation	**53,989**	**50,230**	**49,136**

The Group's net equity was significantly impacted by the 2009 Genentech transaction (see Note 22).

The Group is not subject to regulatory capital adequacy requirements as known in the financial services industry. The Group has a majority shareholding in Chugai (see Note 23). Chugai is a public company and its objectives, policies and processes for managing its own capital are determined by Chugai management.

Financial instrument accounting classifications and fair values

The fair values of financial assets and liabilities, together with the carrying value shown in the consolidated balance sheet, are as follows:

Carrying value and fair value of financial instruments – 2020 in millions of CHF

	Financial instruments mandatorily at fair value through profit or loss	Financial instruments at fair value through OCI	Fair value – hedging instruments	Financial assets at amortised cost	Other financial liabilities	Total carrying value	Fair value
At 31 December 2020							
Other non-current assets [15]							
– Equity investments	768	506	–	–	–	1,274	1,274
– Other financial non-current assets	–	–	–	127	–	127	127
Accounts receivable [12]	–	–	–	10,154	–	10,154	10,154
Marketable securities [13]							
– Equity securities	11	–	–	–	–	11	11
– Debt securities	–	590	–	–	–	590	590
– Money market instruments	–	2,734	–	–	–	2,734	2,734
– Time accounts over three months	–	–	–	3,272	–	3,272	3,272
Cash and cash equivalents [14]	–	–	–	5,727	–	5,727	5,727
Other current assets [16]							
– Derivative financial instruments	–	–	398	–	–	398	398
– Other financial current assets	–	–	–	687	–	687	687
Total financial assets	**779**	**3,830**	**398**	**19,967**	**–**	**24,974**	**24,974**
Debt [21]							
– Bonds and notes	–	–	–	–	(12,024)	(12,024)	(13,605)
– Other debt	–	–	–	–	(2,192)	(2,192)	(2,192)
Contingent consideration [20]	(150)	–	–	–	–	(150)	(150)
Accounts payable [17]	–	–	–	–	(4,121)	(4,121)	(4,121)
Other non-current liabilities [18]	–	–	–	–	(1,107)	(1,107)	(1,107)
Other current liabilities [19]	–	–	(286)	–	(11,483)	(11,769)	(11,769)
Total financial liabilities	**(150)**	**–**	**(286)**	**–**	**(30,927)**	**(31,363)**	**(32,944)**

Carrying value and fair value of financial instruments – 2019 in millions of CHF

	Financial instruments mandatorily at fair value through profit or loss	Financial instruments at fair value through OCI	Fair value – hedging instruments	Financial assets at amortised cost	Other financial liabilities	Total carrying value	Fair value
At 31 December 2019							
Other non-current assets [15]							
– Equity investments	696	41	–	–	–	737	737
– Other financial non-current assets	–	–	–	130	–	130	130
Accounts receivable [12]	–	–	–	10,440	–	10,440	10,440
Marketable securities [13]							
– Equity securities	13	–	–	–	–	13	13
– Debt securities	–	807	–	–	–	807	807
– Money market instruments	–	1,491	–	–	–	1,491	1,491
– Time accounts over three months	–	–	–	3,472	–	3,472	3,472
Cash and cash equivalents [14]	–	–	–	6,075	–	6,075	6,075
Other current assets [16]							
– Derivative financial instruments	–	–	178	–	–	178	178
– Other financial current assets	–	–	–	943	–	943	943
Total financial assets	**709**	**2,339**	**178**	**21,060**	**–**	**24,286**	**24,286**
Debt [21]							
– Bonds and notes	–	–	–	–	(12,666)	(12,666)	(13,953)
– Other debt	–	–	–	–	(1,697)	(1,697)	(1,697)
Contingent consideration [20]	(205)	–	–	–	–	(205)	(205)
Accounts payable [17]	–	–	–	–	(3,822)	(3,822)	(3,822)
Other non-current liabilities [18]	–	–	–	–	(1,144)	(1,144)	(1,144)
Other current liabilities [19]	–	–	(266)	–	(11,613)	(11,879)	(11,879)
Total financial liabilities	**(205)**	**–**	**(266)**	**–**	**(30,942)**	**(31,413)**	**(32,700)**

The fair value of bonds and notes is Level 1 and is calculated based on the observable market prices of the debt instruments or the present value of the future cash flows on the instrument, discounted at a market rate of interest for instruments with similar credit status, cash flows and maturity periods.

Fair value hierarchy

The table below analyses financial instruments carried at fair value, by valuation method. The different levels have been defined as follows:

- Level 1 – quoted prices (unadjusted) in active markets for identical assets and liabilities.
- Level 2 – observable inputs other than quoted prices in active markets for identical assets and liabilities.
- Level 3 – unobservable inputs.

Fair value hierarchy of financial instruments in millions of CHF

	Level 1	Level 2	Level 3	Total
At 31 December 2020				
Marketable securities [13]				
– Equity securities at fair value through profit or loss	11	–	–	11
– Debt securities at fair value through OCI	590	0	–	590
– Money market instruments at fair value through OCI	414	2,320	–	2,734
Derivative financial instruments [16]	–	398	–	398
Equity investments at fair value through OCI [15]	481	25	–	506
Equity investments at fair value through profit or loss [15]	580	188	–	768
Financial assets recognised at fair value	**2,076**	**2,931**	**–**	**5,007**
Derivative financial instruments [19]	–	(286)	–	(286)
Contingent consideration [20]	–	–	(150)	(150)
Financial liabilities recognised at fair value	**–**	**(286)**	**(150)**	**(436)**
At 31 December 2019				
Marketable securities [13]				
– Equity securities at fair value through profit or loss	13	–	–	13
– Debt securities at fair value through OCI	729	78	–	807
– Money market instruments at fair value through OCI	0	1,491	–	1,491
Derivative financial instruments [16]	–	178	–	178
Equity investments at fair value through OCI [15]	0	41	–	41
Equity investments at fair value through profit or loss [15]	465	231	–	696
Financial assets recognised at fair value	**1,207**	**2,019**	**–**	**3,226**
Derivative financial instruments [19]	–	(266)	–	(266)
Contingent consideration [20]	–	–	(205)	(205)
Financial liabilities recognised at fair value	**–**	**(266)**	**(205)**	**(471)**

Level 1 financial assets consist of treasury bills, bonds and quoted shares. Level 2 financial assets consist primarily of commercial paper, certificates of deposit and derivative financial instruments.

The Group determines Level 2 fair values using the following valuation techniques:

- Marketable securities and derivative financial instruments are based on valuation models that use observable market data for interest rates, yield curves, foreign exchange rates and implied volatilities for similar instruments at the measurement date.
- Equity investments at fair value through OCI and at fair value through profit or loss are based on a valuation model that uses the most recently published observable market data.

The Group recognises transfers between levels of the fair value hierarchy as at the end of the reporting period during which the transfer has occurred. There were no significant transfers between Level 1 and Level 2 and vice versa during the year (2019: none).

Level 3 fair values

Details of the determination of Level 3 fair value measurements are set out below.

Contingent consideration arrangements in millions of CHF

	2020	2019
At 1 January	(205)	(511)
Arising from business combinations	0	0
Utilised for settlements [6]	9	172
Total gains and losses included in the income statement		
– Unused amounts reversed – recorded within general and administration	56	152
– Additional amount created – recorded within general and administration	(10)	(6)
– Discount unwind included in financing costs	(7)	(14)
Total gains and losses included in other comprehensive income		
– Currency translation effects	7	2
At 31 December	**(150)**	**(205)**

Contingent consideration arrangements

The Group is party to certain contingent consideration arrangements, including those from business combinations. The fair values of contingent consideration from business combinations are determined considering the expected payments, discounted to present value using a risk-adjusted average discount rate of 2.1% (2019: 3.0%). The expected payments are determined by considering the possible scenarios of forecast sales and other performance criteria, the amount to be paid under each scenario, and the probability of each scenario. The significant unobservable inputs are the forecast sales, other performance criteria and the risk-adjusted discount rate. The estimated fair value would increase if the forecast sales or other performance criteria rates were higher or the risk-adjusted discount rate was lower. At 31 December 2020 the total potential payments under contingent consideration arrangements arising from business combinations could be up to CHF 0.4 billion (2019: CHF 0.5 billion) as follows:

Potential payments under contingent consideration arrangements in millions of CHF

Acquisition	Year acquired	Operating segment	2020	2019
Dutalys	2014	Roche Pharmaceuticals	194	223
Santaris	2014	Roche Pharmaceuticals	22	142
Genia	2014	Diagnostics	143	157
Others	Various	Diagnostics	9	10
At 31 December			**368**	**532**

Derivative financial instruments

The Group has entered into various currency swaps for certain non-US dollar debt instruments. Cash collateral agreements were entered into with the counterparties to the currency swaps to mitigate counterparty risk. The following table sets out the carrying value of derivative financial instruments and the amounts that are subject to master netting agreements.

Derivative financial instruments in millions of CHF

			Assets			Liabilities
	2020	2019	2018	2020	2019	2018
Foreign currency derivatives						
– Forward exchange contracts	389	170	131	(249)	(147)	(64)
– Cross-currency swaps	0	0	0	(37)	(119)	(67)
– Other	0	0	0	0	0	0
Interest rate derivatives						
– Swaps	9	8	7	0	0	(22)
– Other	0	0	0	0	0	0
Other derivatives	0	0	0	0	0	0
Carrying value of derivative financial instruments [16, 19]	**398**	**178**	**138**	**(286)**	**(266)**	**(153)**
Derivatives subject to master netting agreements	(140)	(64)	(63)	140	64	63
Collateral arrangements	(184)	16	(33)	23	132	39
Net amount	**74**	**130**	**42**	**(123)**	**(70)**	**(51)**

Collateral arrangements

Movements in cash collateral other receivable (accrued liability) in millions of CHF

	2020	2019
At 1 January	148	6
Net cash delivered by (to) the Group	(300)	150
Fair value and other	0	(1)
Currency translation effects	(9)	(7)
At 31 December	**(161)**	**148**

Hedge accounting

As described above the Group's risk management strategy is to hedge the transaction exposures arising through foreign currency flows or monetary positions held in foreign currencies as well as to generate an appropriate mix of fixed and floating rate exposures. The level of hedging depends on market conditions and business requirements of the Group. The Group designates a specific interest rate risk management objective to ensure that a predetermined level of its interest rate risk exposure is at a floating rate.

Hedge effectiveness is determined at the inception of the hedge relationship, and through periodic prospective effectiveness assessments at each reporting date to ensure that an economic relationship exists between the hedged item and the hedging instrument. The Group performs a qualitative assessment of the hedge effectiveness using a critical terms match method. As the critical terms of the hedged items and the hedging instruments match, the Group concludes that risks being hedged for the hedged items and the hedging instruments are sufficiently aligned, that there is no inherent mismatch in the hedging relationship and that a 100% hedge ratio applies both for the actual quantities hedged and for the hedge accounting.

Accounting treatment, sources of ineffectiveness and prospective effectiveness assessment method by risk category

	Accounting treatment	Potential sources of ineffectiveness	Prospective effectiveness assessment method
Interest rate and foreign exchange rate fluctuations	Cash flow hedge	Counterparty credit risk	Critical terms match
Foreign exchange rate fluctuations	Cash flow hedge	Lower volume of hedged items / counterparty credit risk	Critical terms match
Interest rate fluctuations	Fair value hedge	Counterparty credit risk	Critical terms match

The ineffective portion of the hedge accounting is recognised in the income statement and included in other financial income (expense). It is measured using the hypothetical derivative method for cash flow hedges and the cumulative dollar offset method for fair value hedges. At 31 December 2020 and 31 December 2019, respectively, none of the above potential sources of ineffectiveness, individually or collectively, resulted in material amounts of actual ineffectiveness being reported for any hedge accounting relationships.

The table below shows fair values and nominal amounts of derivative financial instruments, including a range of the maturity of the nominal amount of the hedging instruments, which are designated as hedging instruments in a cash flow hedge and a fair value hedge. At 31 December 2020 and 2019, respectively, the Group has the following cash flow hedges and fair value hedges which are designated in a qualifying hedge relationship:

Fair values and nominal amounts of derivatives used for hedge accounting – at 31 December 2020

	Nominal amount	Fair value asset in million CHF	Fair value liability in million CHF	Maturity range
Cash flow hedges				
Risk hedged: interest rate and foreign exchange rate fluctuations				
– Cross-currency swaps	EUR 850 million fixed into USD	0	(37)	2021
Risk hedged: foreign exchange rate fluctuations				
– Forward exchange contracts	JPY 509 billion	14	(67)	2021– 2022
Total		**14**	**(104)**	
Fair value hedges				
Risk hedged: interest rate fluctuations				
– Interest rate swaps	USD 500 million	3	0	2021– 2022
– Interest rate swaps	EUR 200 million	1	0	2021– 2025
– Interest rate swaps	CHF 800 million	5	0	2022– 2024
Total		**9**	**0**	

Fair values and nominal amounts of derivatives used for hedge accounting – at 31 December 2019

	Nominal amount	Fair value asset in million CHF	Fair value liability in million CHF	Maturity range
Cash flow hedges				
Risk hedged: interest rate and foreign exchange rate fluctuations				
– Cross-currency swaps	EUR 850 million fixed into USD	0	(119)	2021
Risk hedged: foreign exchange rate fluctuations				
– Forward exchange contracts	JPY 422 billion	40	(56)	2020–2021
Total		**40**	**(175)**	
Fair value hedges				
Risk hedged: interest rate fluctuations				
– Interest rate swaps	USD 200 million	3	0	2021
– Interest rate swaps	EUR 100 million	0	0	2021
– Interest rate swaps	CHF 400 million	5	0	2022
Total		**8**	**0**	

The fair values of derivative financial instruments used for hedge accounting are included in other current assets (see Note 16) or other current liabilities (see Note 19). The Group's approach to managing market risk, including interest rate risk and foreign currency risk, is discussed in the 'Market risk' section in this Note.

Cash flow hedges. The Group has entered into cross-currency swaps to hedge foreign exchange and interest rate risk on some of the bonds and notes issued by the Group which are denominated in euro. At 31 December 2020 such instruments are recorded as a net fair value liability of CHF 37 million (2019: net fair value liability of CHF 119 million). There was no ineffective portion.

Chugai has entered into forward exchange contracts to hedge a part of its foreign translation exposure to Swiss franc and US dollar. At 31 December 2020 such instruments are recorded as fair value assets of CHF 14 million and as fair value liabilities of CHF 67 million (2019: fair value assets of CHF 40 million and fair value liabilities of CHF 56 million). There was no ineffective portion.

None of the hedging instruments currently held for applying hedge accounting is affected by the InterBank Offered Rates ('IBOR') reform.

Carrying amount of items designated as hedged items in a cash flow hedging relationship in millions of CHF

	2020 Assets	2020 Liabilities	2019 Assets	2019 Liabilities
At 31 December				
Bonds and notes				
Risk hedged by cross-currency swaps: interest rate and foreign exchange rate fluctuations				
– Bonds and notes	–	921	–	922
Inventories				
Risk hedged by forward exchange contracts: foreign exchange rate fluctuations				
– Inventories	4,345	–	3,753	–

Hedging reserve for continuing hedging relationships in millions of CHF

	2020 Total	2020 Cross-currency swaps	2020 Forward exchange contracts	2019 Total	2019 Cross-currency swaps	2019 Forward exchange contracts
At 1 January	13	20	(7)	47	47	0
Gains (losses) taken to equity	34	73	(39)	(72)	(55)	(17)
Transferred to income statement[a)]	(88)	(88)	0	20	20	0
Income taxes	15	3	12	13	8	5
Non-controlling interests	10	0	10	5	0	5
Currency translation effects	0	(1)	1	0	0	0
At 31 December	**(16)**	**7**	**(23)**	**13**	**20**	**(7)**

a) The entire amount transferred to the income statement was reported in other financial income (expense).

In 2020 there are no hedging relationships for which hedge accounting is no longer applied (2019: none). The changes in the hedging reserve within equity are shown in Note 22.

The expected undiscounted cash flows from qualifying cash flow hedges, including interest payments during the duration of the derivative contract and final settlement on maturity, are shown in the table below.

Expected cash flows of qualifying cash flow hedges in millions of CHF

	2020			2019		
	Total	Less than 1 year	More than 1 year	Total	Less than 1 year	More than 1 year
Cash inflows	5,327	4,237	1,090	4,834	3,012	1,822
Cash outflows	(5,413)	(4,313)	(1,100)	(5,001)	(3,027)	(1,974)
Total cash inflow (outflow)	**(86)**	**(76)**	**(10)**	**(167)**	**(15)**	**(152)**

The undiscounted cash flows in the table above will affect profit or loss as shown below. These include interest payments during the duration of the derivative contract but do not include the final settlement on maturity.

Expected cash flows of qualifying cash flow hedges with impact on profit or loss in millions of CHF

	2020			2019		
	Total	Less than 1 year	More than 1 year	Total	Less than 1 year	More than 1 year
Cash inflows	60	60	0	120	60	60
Cash outflows	(67)	(67)	0	(148)	(74)	(74)
Total cash inflow (outflow)	**(7)**	**(7)**	**0**	**(28)**	**(14)**	**(14)**

Fair value hedges. The Group has entered into some interest rate swaps to hedge its exposure to changes in the fair value of some of its fixed-term debt instruments in respect of a benchmark interest rate. At 31 December 2020 such instruments are recorded as fair value assets of CHF 9 million (2019: fair value assets of CHF 8 million). During 2020 fair value adjustments of CHF 1 million were recorded on these interest rate swaps (2019: CHF 23 million). All interest rate swaps currently held for applying hedge accounting are referenced to a benchmark rate other than the London InterBank Offered Rate ('LIBOR') except for the hedging instrument hedging a portion of EUR 100 million of the 6.5% notes due 4 March 2021. As the fair value hedge had been highly effective since inception, the result of the interest rate swaps was largely offset by changes in the fair value of the hedged debt instruments. The Group's approach to managing market risk, including interest rate risk, is discussed in the 'Market risk' section in this Note.

Carrying amount of items designated as hedged items in a fair value hedging relationship in millions of CHF

	Liabilities	Fair value adjustments cumulative	Fair value adjustments in current year
At 31 December 2020			
Bonds and notes			
Risk hedged by interest rate swaps: interest rate fluctuations			
– Bonds and notes	1,459	9	1
At 31 December 2019			
Bonds and notes			
Risk hedged by interest rate swaps: interest rate fluctuations			
– Bonds and notes	705	8	23

On 13 December 2019 the Group resolved to exercise its option to call for early redemption of the 2.0% fixed rate notes with a principal amount of USD 0.6 billion at par three months before the scheduled due date of 13 March 2020 (see Note 21). This resulted in a termination of the fair value hedge accounting applied to the interest rate swaps with a nominal value of USD 600 million and a fair value of less than CHF 1 million at the date of the termination.

Net investment hedges. The Group does not have any net investment hedges.

32. Related parties

Controlling shareholders

The share capital of Roche Holding Ltd, which is the Group's parent company, consists of 160,000,000 bearer shares.

At 31 December 2020 and 2019, based on information supplied to the Group, a shareholder group with pooled voting rights owned 72,018,000 shares, which represented 45.01% of the issued shares. On 5 December 2019 the shareholder group announced that it would continue the shareholder pooling agreement with a modified shareholder composition. This group now consists of Mr André Hoffmann, Ms Marie-Anne Hoffmann, Ms Vera Michalski, Mr Alexander Hoffmann, Mr Frederic Hoffmann, Ms Isabel Hoffmann, Mr Lucas Hoffmann, Ms Marina Hoffmann, Ms Kasia Barbotin-Larrieu, Ms Tatiana Fabre, Mr Andreas Oeri, Ms Catherine Oeri, Ms Sabine Duschmalé, Mr Jörg Duschmalé, Mr Lukas Duschmalé, the charitable foundation Wolf and Artuma Holding Ltd. The shareholder pooling agreement has existed since 1948. The duration of the pool was extended for an indefinite period in 2009. The figures above do not include any shares without pooled voting rights held outside this group by individual members of the group. Ms Maja Oeri, formerly a member of the pool, holds 8,091,900 shares representing 5.057% of the voting rights independently of the pool.

Mr André Hoffmann and Dr Jörg Duschmalé are members of the Board of Directors of Roche Holding Ltd. Dr Andreas Oeri, previously a member of the Board of Directors of Roche Holding Ltd, did not stand for re-election at the Annual General Meeting 2020. Mr Hoffmann received remuneration totalling CHF 437,568 (2019: CHF 439,753), Dr Duschmalé received remuneration totalling CHF 272,500 (2019: nil) and Dr Oeri received remuneration totalling CHF 90,000 (2019: CHF 360,000).

There were no other transactions between the Group and the individual members of the above shareholder group.

Subsidiaries and associates

A listing of the Group subsidiaries and associates is included in Note 33. This listing excludes Chugai's subsidiaries as well as companies that are not material, notably companies that are inactive, dormant or in liquidation. Transactions between the parent company and its subsidiaries and between subsidiaries are eliminated on consolidation. There were no significant transactions between the Group and its associates.

Key management personnel

Total remuneration of key management personnel was CHF 44 million (2019: CHF 46 million).

Members of the Board of Directors of Roche Holding Ltd receive an annual remuneration and payment for their time and expenses related to their membership of Board Committees. The Chairman of the Board of Directors and members of the Corporate Executive Committee (CEC) of Roche Holding Ltd receive remuneration, which consists of an annual salary, a bonus and an expense allowance. The Group pays social insurance contributions in respect of the above remuneration and pays contributions to pension and other post-employment benefit plans for the Chairman of the Board of Directors and the members of the CEC. The members of the CEC also participate in certain equity compensation plans as described below. The terms, vesting conditions and fair value of these awards are disclosed in Note 27. New members of the CEC are included in the table below for the full calendar year in which they joined the CEC. Similarly, members of the CEC retiring partway through the year are included for the full calendar year in which they left the CEC.

Remuneration of the members of the Board of Directors and the Corporate Executive Committee in millions of CHF

	2020	2019
Salaries, including cash-settled bonus	20	23
Bonus Stock Awards	7	6
Social security costs	2	2
Pensions and other post-employment benefits	4	4
Equity compensation plans	7	6
Board fees	3	4
Other employee benefits	1	1
Total	**44**	**46**

For the purposes of these remuneration disclosures the values for equity compensation plans, including the Bonus Stock Awards, are calculated based on the fair value used in Note 27. These represent the cost to the Group of such awards at grant date and reflect, amongst other matters, the observed exercise behaviour and exit rate for the whole population that receive the awards and initial simulations of any performance conditions.

The detailed disclosures regarding executive remuneration that are required by Swiss law are included in the Remuneration Report disclosed in the Annual Report on pages 138 to 165. In those disclosures the values for equity compensation plans, including the Bonus Stock Awards, represent the fair value that the employee receives taking into account the preliminary assessment of any completed performance conditions. These fair values are shown in the table below, which reconciles those disclosures required by Swiss law to the above related party disclosures for key management personnel.

Reconciliation to executive remuneration disclosures required by Swiss law in millions of CHF

	2020	2019
Total remuneration of the members of the Board of Directors and Corporate Executive Committee (IFRS basis – see table above)	44	46
Deduct		
– Bonus Stock Awards (IFRS basis)	(7)	(6)
– Equity compensation plans (IFRS basis)	(7)	(6)
Add back		
– Bonus Stock Awards (Swiss legal basis)	4	3
– Equity compensation plans (Swiss legal basis)	11	12
Total remuneration of the members of the Board of Directors and Corporate Executive Committee (Swiss legal basis)	**45**	**49**
Of which (including social security costs)		
– Board of Directors (page 152 of the Annual Report)	9	10
– Corporate Executive Committee (page 161 of the Annual Report)	36	39

Bonus Stock Awards. The Chairman of the Board of Directors and the Chief Executive Officer will be granted Bonus Stock Awards in lieu of their cash-settled bonus for the financial year 2020. These are subject to approval by the 2021 Annual General Meeting in March 2021 and will be issued in March 2021. The number of awards and fair value per award will be calculated at the grant date.

Equity compensation plans. The members of the Corporate Executive Committee received equity compensation as shown in the following tables.

Number of rights, options and awards granted to members of the Corporate Executive Committee

	2020	2019
Roche Stock-settled Stock Appreciation Rights	237,498	308,965
Roche Restricted Stock Unit Plan	7,965	10,664

Contributions paid for members of the Corporate Executive Committee in millions of CHF

	2020	2019
Roche Connect	0.2	0.2

Defined benefit plans

Transactions between the Group and the various defined benefit plans for the employees of the Group are described in Note 26.

33. List of subsidiaries and associates

The following is a listing of the Group subsidiaries and associates. It excludes Chugai's subsidiaries as well as companies that are not material, notably companies that are inactive, dormant or in liquidation.

Listed companies

Location	Company	City		Share capital (in millions)	Equity interest (in %)
Switzerland	Roche Holding Ltd Stock Exchange: SIX Swiss Exchange Zurich Stock code (Share): RO, Valor: 1203211 Stock code *(Genussschein)*: ROG, Valor: 1203204 ISIN Share: CH0012032113 ISIN *Genussschein*: CH0012032048 Market capitalisation: CHF 263,776 million	Basel	CHF	160.0	
Japan	Chugai Pharmaceutical Co., Ltd. Stock Exchange: Tokyo Stock code: TSE:4519 ISIN: JP3519400000 Market capitalisation: JPY 9,046,223 million	Tokyo	JPY	1,005.7	61.2

Non-listed companies

Location	Company	City		Share capital (in millions)	Equity interest (in %)
Algeria	Roche Algérie SPA	Hydra	DZD	1.0	48
Argentina	Productos Roche S A. Química e Industrial	Tigre	ARS	2,841.6	100
	Roche Diabetes Care Argentina S.A.	Tigre	ARS	87.4	100
Australia	Roche Diabetes Care Australia Pty Limited	North Ryde	AUD	14.1	100
	Roche Diagnostics Australia Pty Limited	North Ryde	AUD	5.0	100
	Roche Products Pty Limited	Sydney	AUD	65.0	100
Austria	mySugr GmbH	Vienna	EUR	5.7	100
	Roche Austria GmbH	Vienna	EUR	14.5	100
	Roche Diabetes Care Austria GmbH	Vienna	EUR	(–)	100
	Roche Diagnostics GmbH	Vienna	EUR	1.1	100
Bangladesh	Roche Bangladesh Limited	Dhaka	BDT	27.2	100
Belarus	FLLC "Roche Products Limited"	Minsk	USD	1.5	100
Belgium	N.V. Roche S.A.	Brussels	EUR	32.0	100
	Roche Diagnostics Belgium NV	Diegem	EUR	3.8	100
Bermuda	Chemical Manufacturing and Trading Company Limited	Hamilton	USD	(–)	100
	Hoffmann-La Roche Products Limited	Hamilton	USD	(–)	100
	Roche Capital Services Ltd.	Hamilton	RUB	(–)	100
	Roche Catalyst Investments Ltd.	Hamilton	USD	(–)	100
	Roche Financial Investments Ltd.	Hamilton	USD	(–)	100
	Roche Financial Management Ltd.	Hamilton	USD	(–)	100
	Roche Financial Services Ltd.	Hamilton	USD	(–)	100
	Roche International Ltd.	Hamilton	USD	(–)	100
	Roche Intertrade Limited	Hamilton	USD	10.0	100
	Roche Operations Ltd.	Hamilton	USD	(–)	100
	Roche Services Holdings Ltd.	Hamilton	USD	(–)	100
	Sapac Corporation Ltd.	Hamilton	CAD	(–)	100
Bolivia	Roche Bolivia S.R.L.	Santa Cruz	BOB	0.1	100
Bosnia and Herzegovina	Roche d.o.o. farmaceutsko drustvo – Roche Ltd. Pharmaceutical Company	Sarajevo	BAM	13.1	100
Brazil	Produtos Roche Químicos e Farmacêuticos S.A.	São Paulo	BRL	1,141.7	100
	Roche Diabetes Care Brasil Ltda.	São Paulo	BRL	44.4	100
	Roche Diagnostica Brasil Ltda.	São Paulo	BRL	683.5	100
Bulgaria	Roche Bulgaria EOOD	Sofia	BGN	5.1	100
Cameroon	Roche Cameroun SARL	Douala	XAF	60.0	100
Canada	Hoffmann-La Roche Limited	Mississauga	CAD	40.3	100
Chile	Roche Chile Limitada	Santiago de Chile	CLP	70.9	100

Location	Company	City		Share capital (in millions)	Equity interest (in %)
China	Roche (China) Holding Ltd.	Shanghai	USD	37.3	100
	Roche (Shanghai) Pharmaceuticals Consulting Co., Ltd.	Shanghai	CNY	30.0	100
	Roche (Shanghai) Pharmaceuticals Trading Co., Ltd.	Shanghai	USD	55.0	100
	Roche Diagnostics (Hong Kong) Limited	Hong Kong	HKD	10.0	100
	Roche Diagnostics (Shanghai) Ltd.	Shanghai	USD	31.0	100
	Roche Diagnostics (Suzhou) Limited	Suzhou	USD	160.0	100
	Roche Hong Kong Limited	Hong Kong	HKD	10.0	100
	Roche R&D Center (China) Ltd.	Shanghai	USD	35.8	100
	Shanghai Roche Pharmaceuticals Limited	Shanghai	USD	278.7	70
Colombia	Productos Roche S.A.	Bogotá	COP	26,923.7	100
Costa Rica	Roche Services Americas, Sociedad de Responsabilidad Limitada	San Jose	CRC	361.4	100
	Roche Servicios S.A.	Heredia	USD	8.1	100
Côte d'Ivoire	Roche Côte d'Ivoire SARL	Abidjan	XOF	50.0	100
Croatia	Roche d.o.o.	Zagreb	HRK	4.8	100
Czech Republic	Roche s.r.o.	Prague	CZK	200.0	100
Denmark	OBI Aps	Hadsund	DKK	4.4	100
	Roche a/s, Medicinalvarer og Kemikalier	Hvidovre	DKK	4.0	100
	Roche Diagnostics a/s	Hvidovre	DKK	1.3	100
	Roche Innovation Center Copenhagen A/S	Hoersholm	DKK	100.1	100
Dominican Republic	Productos Roche Dominicana, S.R.L.	Santo Domingo	DOP	0.6	100
Ecuador	Roche Ecuador S.A.	Quito	USD	28.1	100
Egypt	Roche Diagnostics Egypt for Trading S.A.E.	Giza	EGP	5.0	100
	Roche Egypt for Manufacturing and Trading SAE	Cairo	EGP	105.0	100
	Roche Egypt LLC	Cairo	EGP	104.1	100
El Salvador	Productos Roche (El Salvador) S.A. de C.V.	Antiguo Cuscatlan	SVC	0.2	100
Estonia	Roche Eesti OÜ	Tallinn	EUR	0.1	100
Finland	Roche Diagnostics Oy	Espoo	EUR	0.2	100
	Roche Oy	Espoo	EUR	(–)	100
France	Institut Roche SAS	Boulogne-Billancourt	EUR	0.5	100
	Roche Diabetes Care France SAS	Meylan	EUR	4.5	100
	Roche Diagnostics France SAS	Meylan	EUR	16.0	100
	Roche SAS	Boulogne-Billancourt	EUR	38.2	100
	Timkl SAS	Montbonnot-Saint-Martin	EUR	0.8	100
	Trophos SA	Marseille	EUR	1.9	100
Georgia	Roche Georgia LLC	Tbilisi	GEL	0.5	100
Germany	Ascur Versicherungsvermittlungs GmbH	Grenzach-Wyhlen	EUR	(–)	100
	Foundation Medicine GmbH	Penzberg	EUR	(–)	100
	Galenus Mannheim Pharma GmbH	Mannheim	EUR	(–)	100
	Roche Beteiligungs GmbH	Grenzach-Wyhlen	EUR	3.6	100
	Roche Deutschland Holding GmbH	Grenzach-Wyhlen	EUR	6.0	100
	Roche Diabetes Care Deutschland GmbH	Mannheim	EUR	(–)	100
	Roche Diabetes Care GmbH	Mannheim	EUR	(–)	100
	Roche Diagnostics Automation Solutions GmbH	Ludwigsburg	EUR	(–)	100
	Roche Diagnostics Deutschland GmbH	Mannheim	EUR	1.0	100
	Roche Diagnostics GmbH	Mannheim	EUR	94.6	100
	Roche mtm laboratories AG	Mannheim	EUR	1.4	100
	Roche Pharma AG	Grenzach-Wyhlen	EUR	61.4	100
	Roche Privacy GmbH	Grenzach-Wyhlen	EUR	(–)	100
	Roche Real Estate Services Mannheim GmbH	Mannheim	EUR	1.8	100
	Roche Registration GmbH	Grenzach-Wyhlen	EUR	(–)	100
	RoX Health GmbH	Berlin	EUR	(–)	100
	Signature Diagnostics GmbH	Potsdam	EUR	0.1	100
Ghana	Roche Products Ghana Limited	Accra	GHS	1.2	100
Greece	Roche (Hellas) S.A.	Marousi	EUR	19.2	100
	Roche Diagnostics (Hellas) S.A.	Marousi	EUR	27.8	100
Guatemala	Productos Roche Guatemala (Sociedad Anónima)	Guatemala	GTQ	0.6	100
Honduras	Productos Roche (Honduras), S.A.	Tegucigalpa	HNL	(–)	100
Hungary	Roche (Hungary) Ltd	Budaors	HUF	30.0	100
	Roche Services (Europe) Ltd	Budapest	HUF	3.0	100
India	Roche Diabetes Care India Private Limited	Mumbai	INR	15.2	100
	Roche Diagnostics India Private Limited	Mumbai	INR	149.2	100
	Roche Products (India) Private Limited	Mumbai	INR	14.0	100
	Viewics India Private Limited	Pune	INR	(–)	100

Location	Company	City		Share capital (in millions)	Equity interest (in %)
Indonesia	P.T. Roche Indonesia	Jakarta	IDR	1,323.0	99
Iran	Roche Pars Co. (Ltd.)	Tehran	IRR	41,610.0	100
Ireland	Inflazome Limited	Dublin	EUR	(–)	100
	Roche Ireland Limited	Clarecastle	EUR	2.4	100
	Roche Products (Ireland) Limited	Dublin	EUR	(–)	100
	Spark Therapeutics Ireland Limited	Dublin	EUR	(–)	100
Israel	Medingo Ltd.	Yoqneam Illit	ILS	8.0	100
	Roche Pharmaceuticals (Israel) Ltd.	Hod Hasharon	ILS	(–)	100
Italy	Roche Diabetes Care Italy S p.A.	Monza	EUR	40.2	100
	Roche Diagnostics S p.A.	Monza	EUR	18.1	100
	Roche S.p.A.	Monza	EUR	34.1	100
Japan	Roche DC Japan K. K.	Tokyo	JPY	10.0	100
	Roche Diagnostics K.K.	Tokyo	JPY	2,500.0	100
Jordan	F. Hoffmann-La Roche Ltd / Jordan P.S.C.	Amman	JOD	(–)	100
Kazakhstan	Roche Kazakhstan LLP	Almaty	KZT	150.0	100
Kenya	Roche Kenya Limited	Nairobi	KES	50.0	100
Kuwait	Roche for Trading in Medicines, Equipment, Devices and Medical Supplies SPC	Salmiya	KWD	1.8	100
Latvia	Roche Latvija SIA	Riga	EUR	1.7	100
Lebanon	Roche Lebanon S.A.R.L.	Beirut	LBP	1,000.0	100
Lithuania	UAB Roche Lietuva	Vilnius	EUR	0.2	100
Malaysia	Roche (Malaysia) Sdn. Bhd.	Kuala Lumpur	MYR	4.0	100
	Roche Diagnostics (Malaysia) Sdn. Bhd.	Petaling Jaya	MYR	0.9	100
	Roche Services (Asia Pacific) Sdn. Bhd.	Kuala Lumpur	MYR	0.5	100
Mauritius	Roche Products (Mauritius) Ltd	Moka	MUR	4.0	100
Mexico	Productos Roche, S.A. de C.V.	Mexico City	MXN	82.6	100
	Roche DC México, S.A. de C.V.	Mexico City	MXN	3.9	100
Morocco	Roche S.A.	Casablanca	MAD	59.5	100
Myanmar	Roche Myanmar Company Limited	Yangon	USD	(–)	100
Netherlands	Roche Diabetes Care Nederland B.V.	Almere	EUR	(–)	100
	Roche Diagnostics Nederland B.V.	Almere	EUR	2.3	100
	Roche Finance Europe B.V.	Woerden	EUR	2.0	100
	Roche Nederland B.V.	Woerden	EUR	10.9	100
	Roche Pharmholding B.V.	Woerden	EUR	467.8	100
New Zealand	Roche Diagnostics NZ Limited	Mount Wellington	NZD	3.0	100
	Roche Products (New Zealand) Limited	Auckland	NZD	13.5	100
Nicaragua	Productos Roche (Nicaragua), S.A.	Managua	NIO	0.9	100
Nigeria	Roche Products Limited	Lagos	NGN	200.0	100
North Macedonia	Roche Makedonija DOOEL	Skopje	EUR	0.3	100
Norway	Roche Diagnostics Norge A/S	Oslo	NOK	5.8	100
	Roche Norge A/S	Oslo	NOK	6.2	100
Pakistan	Roche Pakistan Limited	Karachi	PKR	2,063.3	100
Panama	Productos Roche (Panama), S.A.	Panama City	PAB	(–)	100
	Productos Roche Interamericana S.A. (PRISA)	Panama City	USD	0.1	100
Peru	Productos Roche Química Farmacéutica S.A.	Lima	PEN	11.1	100
	Roche Farma (Peru) S.A.	Lima	PEN	38.1	100
Philippines	Roche (Philippines) Inc.	Taguig City	PHP	300.0	100
Poland	Roche Diabetes Care Polska sp. z o.o.	Warsaw	PLN	2.0	100
	Roche Diagnostics Polska Sp. z o.o.	Warsaw	PLN	8.0	100
	Roche Polska Sp. z o.o.	Warsaw	PLN	25.0	100
Portugal	Roche Farmacêutica Química, Lda.	Amadora	EUR	1.1	100
	Roche Sistemas de Diagnósticos, Sociedade Unipessoal, Lda.	Amadora	EUR	2.6	100
Puerto Rico	Genentech P.R., Inc.	San Juan	USD	(–)	100
	Roche Products Inc.	Ponce	USD	0.5	100
	Syntex Puerto Rico, Inc.	Ponce	USD	(–)	100
Romania	Roche Romania S.R.L.	Bucharest	RON	472.2	100
Russian Federation	"Roche-Moscow" JSC	Moscow	RUB	2.6	100
	Limited Liability Company Roche Diabetes Care Rus	Moscow	RUB	100.0	100
	Limited Liability Company Roche Diagnostics Rus	Moscow	RUB	250.0	100
Saudi Arabia	Roche Diagnostics Saudi Arabia LLC	Riyadh	SAR	200.0	75
	Roche Products Saudi Arabia LLC	Jeddah	SAR	30.0	100
Serbia	Roche d.o.o. Beograd	Belgrade	EUR	9.6	100

Location	Company	City		Share capital (in millions)	Equity interest (in %)
Singapore	Roche Diabetes Care Asia Pacific Pte. Ltd.	Singapore	SGD	0.6	100
	Roche Diagnostics Asia Pacific Pte. Ltd.	Singapore	SGD	20.4	100
	Roche Singapore Pte. Ltd.	Singapore	SGD	4.0	100
	Roche Singapore Technical Operations, Pte. Ltd.	Singapore	USD	35.0	100
Slovakia	Roche Slovensko, S.R.O.	Bratislava	EUR	0.3	100
Slovenia	Roche farmacevtska družba, d.o.o.	Ljubljana	EUR	0.2	100
South Africa	Kapa Biosystems (Pty) Ltd	Cape Town	ZAR	(–)	100
	Roche Diabetes Care South Africa Proprietary Limited	Midrand	ZAR	15.0	100
	Roche Diagnostics Proprietary Limited	Midrand	ZAR	(–)	100
	Roche Products (Proprietary) Limited	Illovo	ZAR	60.0	100
South Korea	Roche Diagnostics Korea Co., Ltd.	Seoul	KRW	22,969.0	100
	Roche Korea Company Ltd.	Seoul	KRW	13,375.0	100
Spain	Roche Diabetes Care Spain, S.L.	Sant Cugat del Vallès	EUR	1.0	100
	Roche Diagnostics S.L.	Sant Cugat del Vallès	EUR	17.0	100
	Roche Farma, S.A.	Madrid	EUR	45.0	100
Sweden	Roche AB	Solna	SEK	20.0	100
	Roche Diagnostics Scandinavia AB	Solna	SEK	9.0	100
Switzerland	Biopharm AG	Basel	CHF	0.3	100
	F. Hoffmann-La Roche Ltd	Basel	CHF	150.0	100
	Hoffmann - La Roche Ltd	Basel	CHF	0.5	100
	InterMune International AG	Basel	CHF	10.0	100
	Museum Tinguely AG	Basel	CHF	0.1	100
	Phaor AG	Basel	CHF	0.2	100
	Rabbit-Air Ltd	Bachenbülach	CHF	3.0	100
	Roche Capital Market Ltd	Basel	CHF	1.0	100
	Roche Chemische Unternehmungen AG	Basel	CHF	1.3	100
	Roche Diabetes Care (Switzerland) Ltd	Rotkreuz	CHF	0.1	100
	Roche Diagnostics (Switzerland) Ltd	Rotkreuz	CHF	1.0	100
	Roche Diagnostics International Ltd	Rotkreuz	CHF	20.0	100
	Roche Finance Ltd	Basel	CHF	409.2	100
	Roche Forum Buonas Ltd	Buonas	CHF	0.1	100
	Roche Glycart Ltd	Schlieren	CHF	0.3	100
	Roche Long Term Foundation	Basel	CHF	0.5	100
	Roche Pharma (Switzerland) Ltd	Basel	CHF	2.0	100
	Syntex Pharm AG	Rotkreuz	CHF	0.5	100
	Tavero AG	Basel	CHF	0.1	100
Taiwan	Roche Diagnostics Ltd.	Taipei	TWD	437.9	100
	Roche Products Ltd.	Taipei	TWD	1,438.2	100
Thailand	Roche Diagnostics (Thailand) Limited	Bangkok	THB	103.0	100
	Roche Thailand Limited	Bangkok	THB	12.0	100
Tunisia	Roche Tunisie SA	Tunis	TND	0.8	100
Turkey	Infogenetik Moleküler Bilgi Hizmetleri Anonim Şirketi	Istanbul	TRY	3.5	100
	Roche Diagnostics Turkey Anonim Şirketi	Istanbul	TRY	250.0	100
	Roche Müstahzarlari Sanayi Anonim Şirketi	Istanbul	TRY	249.5	100
Ukraine	Roche Ukraine LLC	Kiev	UAH	124.0	100
United Arab Emirates	Roche Diabetes Care Middle East FZCO	Dubai	AED	0.5	100
	Roche Diagnostics Middle East FZCO	Dubai	AED	19.0	100
	Roche Pharmaceuticals Middle East FZCO	Dubai	AED	0.5	100
United Kingdom	Flatiron Health UK Ltd	St Albans	GBP	(–)	100
	InterMune Holdings Limited	Welwyn Garden City	GBP	(–)	100
	Roche Diabetes Care Limited	Burgess Hill	GBP	0.4	100
	Roche Diagnostics Limited	Burgess Hill	GBP	32.6	100
	Roche Holding (UK) Limited	Welwyn Garden City	GBP	100.0	100
	Roche Products Limited	Welwyn Garden City	GBP	98.3	100
	Roche Registration Limited	Welwyn Garden City	GBP	(–)	100
	Spark Therapeutics UK Ltd	London	GBP	(–)	100
	TMEM16A Limited	Welwyn Garden City	GBP	0.2	100
	Tusk Therapeutics Limited	Welwyn Garden City	GBP	(–)	100

Location	Company	City		Share capital (in millions)	Equity interest (in %)
United States	Adheron Therapeutics Inc.	South San Francisco	USD	(–)	100
	Anadys Pharmaceuticals, Inc.	South San Francisco	USD	(–)	100
	Ariosa Diagnostics, Inc.	San Jose	USD	(–)	100
	BINA Technologies, Inc.	Pleasanton	USD	(–)	100
	BioVeris Corporation	Indianapolis	USD	(–)	100
	Flatiron Health, Inc.	New York	USD	(–)	100
	ForSight VISION4, Inc.	South San Francisco	USD	(–)	100
	Foundation Medicine Securities Corporation	Cambridge	USD	(–)	100
	Foundation Medicine, Inc.	Cambridge	USD	(–)	100
	Genentech USA, Inc.	South San Francisco	USD	(–)	100
	Genentech, Inc.	South San Francisco	USD	(–)	100
	Hoffmann-La Roche Inc.	Little Falls	USD	3.0	100
	I5 Surviving Corp.	South San Francisco	USD	(–)	100
	IGEN International, Inc.	Pleasanton	USD	(–)	100
	IGEN LS LLC	Pleasanton	USD	(–)	100
	Ignyta, Inc.	South San Francisco	USD	(–)	100
	InterMune, Inc.	South San Francisco	USD	(–)	100
	IQuum, Inc.	Marlborough	USD	(–)	100
	Jecure Therapeutics, Inc.	South San Francisco	USD	(–)	100
	Kapa Biosystems, Inc.	Wilmington	USD	(–)	100
	Lexent Bio, Inc.	South San Francisco	USD	(–)	100
	Memory Pharmaceuticals Corp.	Little Falls	USD	(–)	100
	Promedior, Inc.	South San Francisco	USD	(–)	100
	Roche Diabetes Care, Inc.	Indianapolis	USD	(–)	100
	Roche Diagnostics Corporation	Indianapolis	USD	(–)	100
	Roche Diagnostics Hematology, Inc.	Westborough	USD	(–)	100
	Roche Diagnostics Operations, Inc.	Indianapolis	USD	(–)	100
	Roche Diagnostics Seattle, Inc.	Seattle	USD	(–)	100
	Roche Holdings, Inc.	South San Francisco	USD	1.0	100
	Roche Laboratories Inc.	Little Falls	USD	(–)	100
	Roche Molecular Systems, Inc.	Pleasanton	USD	(–)	100
	Roche Palo Alto LLC	South San Francisco	USD	(–)	100
	Roche Sequencing Solutions, Inc.	Pleasanton	USD	(–)	100
	Roche TCRC, Inc.	Little Falls	USD	(–)	100
	Seragon Pharmaceuticals Inc.	South San Francisco	USD	(–)	100
	Spark Therapeutics International Holdings, Inc.	Philadelphia	USD	(–)	100
	Spark Therapeutics, Inc.	Philadelphia	USD	(–)	100
	Tanox, Inc.	South San Francisco	USD	(–)	100
	Tensha Therapeutics, Inc.	South San Francisco	USD	(–)	100
	Therapeutic Human Polyclonals, Inc.	South San Francisco	USD	(–)	100
	Ventana Medical Systems, Inc.	Tucson	USD	(–)	100
	Viewics, Inc.	Santa Clara	USD	(–)	100
Uruguay	Roche International Ltd. (Montevideo Branch)	Montevideo	UYU	(–)	100
Venezuela	Productos Roche S A.	Caracas	VEF	156.9	100
Vietnam	Roche Pharma (Vietnam) Company Limited	Ho Chi Minh City	VND	23,000.0	100
	Roche Vietnam Company Limited	Ho Chi Minh City	USD	25.0	100

(–) = share capital of less than 100,000 local currency units

34. Significant accounting policies

Consolidation policy

Subsidiaries are all companies over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. Companies acquired during the year are consolidated from the date on which control is transferred to the Group, and subsidiaries to be divested are included up to the date on which control passes from the Group. Intercompany balances, transactions and resulting unrealised income are eliminated in full. Changes in ownership interests in subsidiaries are accounted for as equity transactions if they occur after control has already been obtained and if they do not result in a loss of control. Associates are companies over which the Group exercises, or has the power to exercise, significant influence, but which it does not control, and they are accounted for using the equity method.

Segment reporting

For the purpose of segment reporting the Group's Corporate Executive Committee (CEC) is considered to be the Group's Chief Operating Decision Maker. The determination of the Group's operating segments is based on the organisation units for which information is reported to the CEC on a regular basis. The information provided is used as the basis of the segment revenue and profit disclosures reported in Note 2, with the geographic analysis based on the location of customers. Selected segment balance sheet information is also routinely provided to the CEC.

Transfer prices between operating segments are set on an arm's length basis. Operating assets and liabilities consist of property, plant and equipment, goodwill and intangible assets, trade receivables/payables, inventories and other assets and liabilities, such as provisions, which can be reasonably attributed to the reported operating segments. Non-operating assets and liabilities mainly include current and deferred income tax balances, post-employment benefit assets/liabilities and financial assets/liabilities such as cash, marketable securities, investments and debt.

Foreign currency translation

The Annual Financial Statements are presented in Swiss francs. Most Group companies use their local currency as their functional currency. Certain Group companies use other currencies (such as US dollar, Swiss franc or euro) as their functional currency where this is the currency of the primary economic environment in which the entity operates. Local transactions in other currencies are initially reported using the exchange rate at the date of the transaction. Gains and losses from the settlement of such transactions and gains and losses on translation of monetary assets and liabilities denominated in other currencies are included in income, except when they are qualifying cash flow hedges or arise on monetary items that, in substance, form part of the Group's net investment in a foreign entity. In such cases the gains and losses are deferred into other comprehensive income.

Upon consolidation, assets and liabilities of Group companies using functional currencies other than Swiss francs are translated into Swiss francs using year-end rates of exchange. The income statement and statement of cash flows are translated at the average rates of exchange for the year. Translation differences due to the changes in exchange rates between the beginning and the end of the year and the difference between net income translated at the average and year-end exchange rates are taken directly to other comprehensive income.

Revenue

Sales. Revenue from the sale of goods supplied (product sales) and services rendered are recoded as 'Sales'.

Sales are recognised when a promise in a customer contract (performance obligation) has been satisfied by transferring control over the promised goods and services to the customer. Control over a promised good or service refers to the ability to direct the use of, and obtain substantially all of the remaining benefits from, those goods or services. Control is usually transferred upon shipment, delivery to, upon receipt of goods by the customer, or as services are rendered, in accordance with the delivery and acceptance terms agreed with the customers. For goods subject to installation, such as instruments sold in the Diagnostics Division, sales are generally recognised upon completion of the installation at the customer's site and customer acceptance. The amount of sales to be recognised (transaction price) is based on the consideration the Group expects to receive in exchange for its goods and services, excluding amounts collected on behalf of third parties such as value added taxes or other taxes directly linked to sales. If a contract contains more than one performance obligation, the transaction price is allocated to each performance obligation based on their relative stand-alone selling prices.

Instruments in the Diagnostics Division may be sold together with other goods such as reagents and other consumables as well as services under a single contract or under several contracts that are combined for revenue recognition purposes. Sales are recognised upon satisfaction of each of the performance obligations in the contract. Instruments are either sold in cash and instalment sales transactions or otherwise made available to customers under finance lease and operating lease transactions.

- Finance leases: Arrangements in which the Group transfers substantially all of the risks and rewards of ownership to the customer are treated as finance lease arrangements. Income from finance leases is recognised as revenue at amounts that represent the fair value of the instrument, which approximates the present value of the minimum lease payments under the arrangement. As interest rates embedded in finance lease arrangements are approximately market rates, income from finance leases is comparable to revenue for outright sales. Finance income for finance lease arrangements longer than twelve months is deferred and subsequently recognised based on a pattern that approximates the use of the effective interest rate method and recorded in royalty and other operating income.
- Operating leases: Income from operating leases is recognised as revenue on a straight-line basis over the lease term or, when lease revenue is entirely variable and subject to subsequent reagent sales, as the performance obligation to deliver reagents is satisfied.

Sales, net of discounts, are based on estimates regarding the related obligations, including their stand-alone selling prices or fair values. It requires judgement to determine when different obligations are satisfied, including whether enforceable purchase commitments for further obligations exist and when they arise.

For contracts with distributors, no sales are recognised when goods are physically transferred to the distributor under a consignment arrangement, or if the distributor acts as an agent. In such cases, sales are recognised when control over the goods transfers to the end-customer, and distributor's commissions are presented within marketing and distribution. Commissions and similar payments to distributors acting as principals are deducted from sales unless such payments are in exchange for a distinct service.

The consideration received by the Group in exchange for its goods and services may be fixed or variable. Variable consideration is only recognised when it is considered highly probable that a significant revenue reversal will not occur once the underlying uncertainty related to variable consideration is subsequently resolved. The most common elements of variable consideration in the Pharmaceuticals Division are listed below:

- Government and regulatory mandatory price reductions. These consist of mandatory price reductions. The major elements are the 340B Drug Discount Program, Medicaid and other plans in the US.
- Contractual price reductions. These include rebates and chargebacks that are the result of contractual agreements that are primarily volume based and performance based.
- Cash discounts. These include credits offered to wholesalers for remitting payment on their purchases within contractually defined incentive periods.
- Customer returns reserves. These are allowances established for expected product returns.

Revenues from product sales are recorded net of allowances for estimated rebates, chargebacks, cash discounts and estimates of product returns, all of which are established at the time of sale. All product sales allowances are based on estimates of the amounts earned or to be claimed on the related sales. These estimates take into consideration historical experience, current contractual and statutory requirements, specific known market events and trends such as competitive pricing and new product introductions, estimated inventory levels, and the shelf life of products. If actual future results vary, these estimates need to be adjusted, with an effect on sales and earnings in the period of the adjustment. Sales reductions that are expected to be withheld by the customer upon settlement, such as contractual price reductions and cash discounts, are recorded in the balance sheet as a deduction from trade receivables. Sales reductions that are separately payable to customers, governmental health authorities or healthcare regulatory authorities are recorded in the balance sheet as accrued liabilities. Provisions for sales returns are recorded in the balance sheet as other provisions.

The Group recognises a deferred income (contract liability) if consideration has been received (or has become receivable) before the Group transfers the promised goods or services to the customer. Deferred income mainly relates to remaining performance obligations for goods free of charge under certain patient access or similar programmes, reagents and other consumables and services.

Remaining performance obligations in (partially) unsatisfied long-term contracts are either included in deferred income or are related to amounts the Group expects to receive for goods and services that have not yet been transferred to customers under existing, non-cancellable or otherwise enforceable contracts. These are mainly associated with contracts with minimum purchase commitments related to reagents and consumables for previously sold instruments as well as monitoring and maintenance services. For contracts that have an original duration of one year or less, the Group has elected the practical expedient to not disclose the transaction price for remaining performance obligations at the end of each reporting period and at which point in time the Group expects to recognise these sales.

Royalty and other operating income. Royalty and other operating income includes royalty income, income from out-licensing agreements and income from disposal of products and other items.

Royalty income earned through a licence is recognised as the underlying sales are recorded by the licensee.

Income from out-licensing agreements typically arises from the receipt of upfront, milestone and other similar payments from third parties for granting a licence to product- or technology-related intellectual property (IP). Out-licensing agreements may be entered into with no further obligation or may include commitments to conduct research, late-stage development, regulatory approval, co-marketing or manufacturing. Licences granted are usually rights to use IP and are generally unique. Therefore the basis of allocating revenue to performance obligations makes use of the residual approach. Upfront payments and other licensing fees are usually recognised upon granting the licence unless some of the income shall be deferred for other performance obligations using the residual approach. Such deferred income is released and recognised as revenue when other performance obligations are satisfied. Milestone payments are typically received upon reaching a specific scientific milestone (development milestone) or upon achieving a certain annual sales milestone (commercial milestone). Development milestone income is recognised at the point in time when it is highly probable that the respective milestone event criteria is achieved, and the risk of revenue reversal is considered remote. Commercial milestone income is accrued and recognised as revenue when it is highly probable that the annual sales milestone is reached during the period.

Payments received for the disposal of product and similar rights are recognised as revenue upon transfer of control over such rights. To the extent that some of these payments relate to other performance obligations, a portion is deferred using the residual approach and recognised as revenue when or as activities such as manufacturing or other services are rendered. Income from profit-sharing arrangements with collaboration partners is recognised as underlying sales and cost of sales are recorded by the collaboration partners. Also included is income from other services rendered which are usually not part of the Group's primary business activities, to the extent that such revenue is not recorded under 'Sales', and is recognised when control transfers and performance obligations are satisfied.

Cost of sales

Cost of sales includes the corresponding direct production costs and related production overheads of goods sold and services rendered. Royalties, alliance and collaboration expenses, including all collaboration profit-sharing arrangements are also reported as part of cost of sales. Start-up costs between validation and the achievement of normal production capacity are expensed as incurred.

Research and development

Internal research and development activities are expensed as incurred for the following:

- Internal research costs incurred for the purpose of gaining new scientific or technical knowledge and understanding.
- Internal development costs incurred for the application of research findings or other knowledge to plan and develop new products for commercial production. The development projects undertaken by the Group are subject to technical, regulatory and other uncertainties, such that, in the opinion of management, the criteria for capitalisation as intangible assets are not met prior to obtaining marketing approval by the regulatory authorities in major markets.
- Post-marketing studies after regulatory approval, such as phase IV costs in the pharmaceuticals business, generally involve safety surveillance and ongoing technical support of a drug after it receives marketing approval to be sold. They may be required by regulatory authorities or may be undertaken for safety or commercial reasons. The costs of such post-marketing studies are not capitalised as intangible assets as, in the opinion of management, they do not generate separately identifiable incremental future economic benefits that can be reliably measured.

Acquired in-process research and development resources obtained through in-licensing arrangements, business combinations or separate asset purchases are capitalised as intangible assets. The acquired asset must be controlled by the Group, be separately identifiable and expected to generate future economic benefits, even if uncertainty exists as to whether the research and development will ultimately result in a marketable product. Consequently, upfront and milestone payments to third parties for pharmaceutical products or compounds before regulatory marketing approval are recognised as intangible assets. Assets acquired through such arrangements are measured on the basis set out in the 'Intangible assets' policy. Subsequent internal research and development costs incurred post-acquisition are treated in the same way as other internal research and development costs. If research and development are embedded in contracts for strategic alliances, the Group carefully assesses whether upfront or milestone payments constitute funding of research and development work or acquisition of an asset.

Employee benefits

Short-term employee benefits include wages, salaries, social security contributions, paid annual leave and sick leave, profit sharing and bonuses, and non-monetary benefits for current employees. The costs are recognised within the operating results when the employee has rendered the associated service. The Group recognises a liability for profit sharing and bonuses where contractually obliged or where there is a past practice that has created a constructive obligation.

Long-term employee benefits include long-service or sabbatical leave, long-service benefits and long-term disability benefits. The expected costs of these benefits are accrued over the period of employment. Any changes in the carrying value of other long-term employee benefit liabilities are recognised within the operating results.

Termination benefits are payable when employment is terminated by the Group before the normal retirement date, or whenever an employee accepts voluntary redundancy in exchange for these benefits. Termination costs are recognised at the earlier of when the Group can no longer withdraw the offer of the benefits or when the Group recognises any related restructuring costs.

Pensions and other post-employment benefits

For defined contribution plans the Group contributions are recognised within the operating results when the employee has rendered the associated service. Prepaid contributions are recognised as an asset to the extent that a cash refund or a reduction in future payments is available.

For defined benefit plans the liability recognised in the balance sheet is the present value of the defined benefit obligation less the fair value of the plan assets. All changes in the net defined benefit liability are recognised as they occur as follows:

Recognised in the income statement:
- Current service cost is charged to the appropriate income statement heading within the operating results.
- Past service cost, including curtailment gains or losses, is recognised immediately in general and administration within the operating results.
- Settlement gains or losses are recognised in general and administration within the operating results.
- Net interest on the net defined benefit liability is recognised in financing costs.

Recognised in other comprehensive income:
- Actuarial gains and losses arising from experience adjustments (the difference between previous assumptions and what has actually occurred) and changes in actuarial assumptions.
- The return on plan assets, excluding amounts included in net interest on the net defined benefit liability.
- Any change in the limit on the recognition of plan assets, excluding amounts included in net interest on the net defined benefit liability.

Net interest on the net defined benefit liability is comprised of interest income on plan assets, interest cost on the defined benefit obligation and interest on the effect of the limit on the recognition of pension assets. The net interest is calculated using the same discount rate that is used in calculating the defined benefit obligation, applied to the net defined liability at the start of the period, taking into account any changes from contribution or benefit payments.

Pension assets and liabilities in different defined benefit plans are not offset unless the Group has a legally enforceable right to use the surplus in one plan to settle obligations in the other plan.

Equity compensation plans

The fair value of all equity compensation awards granted to employees is estimated at the grant date and recorded as an expense over the vesting period. The expense is charged to the appropriate income statement heading within the operating results. For equity-settled plans, an increase in equity is recorded for this expense and any subsequent cash flows from exercises of vested awards are recorded as changes in equity.

Property, plant and equipment

Property, plant and equipment are initially recorded at cost of purchase or construction, and include all costs directly attributable to bringing the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. These include items such as costs of site preparation, installation and assembly costs, and professional fees. The net costs of testing whether the asset is functioning properly, including validation costs, are also included in the initially recorded cost of construction. Interest and other borrowing costs incurred with respect to qualifying assets are capitalised and included in the carrying value of the assets. Property, plant and equipment are depreciated on a straight-line basis, except for land, which is not depreciated. The estimated useful lives of major classes of depreciable assets are as follows:

Land improvements	40 years
Buildings	10–50 years
Machinery and equipment	4–15 years
Diagnostic instruments	3–5 years
Office equipment	3–6 years
Motor vehicles	5–8 years

Where parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate components. The estimated useful lives of the assets are regularly reviewed and, if necessary, the future depreciation charges are accelerated. Repairs and maintenance costs are expensed as incurred.

Leases

Where the Group is the lessee – policy applicable from 1 January 2019. At inception of a contract the Group assesses whether a contract is, or contains, a lease. A contract is, or contains, a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration. The Group recognises a right-of-use asset and a corresponding lease liability for each contract that is, or contains, a lease at the lease commencement date, except for short-term leases and leases of low-value assets. Payments for short-term leases and leases of low-value assets are recognised as an expense on a straight-line basis over the term of the respective lease. The lease liability is initially measured at the present value of the future lease payments that are not paid at the lease commencement date. The lease payments are discounted using the interest rate implicit in the lease or, if not readily determinable, the Group's incremental borrowing rate in the respective markets. Lease payments include fixed payments, variable payments that depend on an index or rate known at the lease commencement date and payments from exercising extension or purchase options if the Group is reasonably certain to exercise. The lease liability is subsequently measured at amortised costs using the effective interest method. It is remeasured, with a corresponding adjustment to the related right-of-use asset, when there is a change in future lease payments following a contract renegotiation, a change of an index or rate or a reassessment of options. The right-of-use asset is initially measured at cost, which comprises the initial amount of the lease liability adjusted for any payments made at or before the lease commencement date and which includes any initial direct costs incurred and expected costs of obligations to dismantle, remove or refurbish the underlying asset, less any incentives received. Right-of-use assets are depreciated on a straight-line basis from the lease commencement date over the shorter of the lease term or the useful life of the underlying asset. Right-of-use assets are assessed for impairment whenever there is an indication for impairment.

Where the Group is the lessee – policy applicable before 1 January 2019. The Group classified leases that substantially transferred all of the risks and rewards of ownership as finance leases. Finance leases were capitalised as property, plant and equipment at the start of the lease at fair value, or the present value of the minimum lease payments, if lower. The rental obligation, net of finance charges, was reported within debt. Finance lease assets were depreciated over the shorter of the lease term and its useful life. The interest element of the lease payment was charged against income over the lease term based on the effective interest rate method. All other leases were classified as operating leases. Operating leases existed when substantially all of the risks and rewards of ownership were not transferred to the Group. Payments made under operating leases were charged against income on a straight-line basis over the period of the lease.

Where the Group is the lessor. Certain assets, mainly Diagnostics instruments, are leased to third-party customers through both finance and operating lease arrangements. Such transactions may be entered into in separate contracts or in combined contracts including reagents and other consumables and services. The treatment of leasing transactions is mainly determined by whether the lease is considered to be an operating or finance lease. In making this assessment, management looks at the substance of the lease, as well as the legal form, and makes a judgement about whether substantially all of the risks and rewards of ownership are transferred. If this is the case, then the lease is a finance lease. If not, then it is an operating lease. Arrangements which do not take the legal form of a lease but that nevertheless convey the right to use an asset are also covered by such assessments.

- Finance leases: Finance lease assets are reported as receivables at an amount equal to the net investment in the lease. Income from finance leases is recognised as revenue at amounts that represent the stand-alone selling price of the instrument, which approximates the present value of the minimum lease payments under the arrangement. Minimum lease payments exclude any variable lease payments or contingent rent. Finance income for finance lease arrangements longer than twelve months is deferred and subsequently recognised based on a pattern that approximates the use of the effective interest method and recorded in royalty and other operating income.
- Operating leases: Income from operating leases is recognised as revenue on a straight-line basis over the lease term at amounts that represent the stand-alone selling price of the instrument, which approximates the present value of the minimum lease payments under the arrangement. Minimum lease payments exclude any variable lease payments or contingent rent. When lease revenue is entirely based on variable lease payments and subject to subsequent reagent sales, it is recognised as the performance obligations for reagents are satisfied.

Sales, net of discounts, are based on estimates regarding the related obligations, including their stand-alone selling prices. It requires judgement to determine when different obligations are satisfied, including whether enforceable purchase commitments for further obligations exist and when they arise.

Mergers and acquisitions

Business combinations. Business combinations are accounted for using the acquisition method of accounting. At the date of the acquisition the Group initially recognises the fair value of the identifiable assets acquired, the liabilities assumed and any non-controlling interest in the acquired business. The consideration transferred is measured at fair value at the date of acquisition. Where the Group does not acquire 100% ownership of the acquired business, non-controlling interests are recorded either at fair value or as the proportion of the fair value of the acquired net assets attributable to the non-controlling interest. Directly attributable acquisition-related costs are expensed as incurred within general and administration expenses.

Asset acquisitions. Asset acquisitions are acquisitions of legal entities that do not qualify as business combinations. At the date of the acquisition the Group initially recognises the individual identifiable assets acquired and liabilities assumed. The cost to the Group at the date of the acquisition is allocated to the individual identifiable assets and liabilities on the basis of their relative fair values at the date of the acquisition. Subsequent consideration for performance-related development milestones is recognised as intangible assets when the specific milestones have been achieved. Such transactions do not give rise to goodwill. Material directly attributable acquisition-related costs are included in the cost of the acquired assets.

Goodwill

Goodwill arises in a business combination and is the excess of the consideration transferred to acquire the business over the underlying fair value of the net identified assets acquired. Goodwill is not amortised but is tested for impairment at least annually and upon the occurrence of an indication of impairment.

Intangible assets

Purchased patents, licences, trademarks and other intangible assets are initially recorded at cost. Assets that have been acquired through a business combination are initially recorded at fair value. Commercial software development costs are capitalised when certain recognition criteria such as technical feasibility and commercial viability are met. Once available for use, intangible assets are amortised on a straight-line basis over their useful lives. Intangible assets are reviewed for impairment at each reporting date. The estimated useful life is the lower of the legal duration and the economic useful life. The estimated useful lives of intangible assets are regularly reviewed. Estimated useful lives of major classes of amortisable intangible assets are as follows:

Product intangibles in use	up to 20 years
Marketing intangibles in use	up to 15 years
Technology intangibles in use	up to 20 years

Impairment of property, plant and equipment, right-of-use assets and intangible assets

An impairment assessment is carried out when there is evidence that an asset may be impaired. In addition, intangible assets that are not yet available for use are tested for impairment annually. When the recoverable amount of an asset, being the higher of its fair value less costs of disposal and its value in use, is less than its carrying value, then the carrying value is reduced to its recoverable amount. This reduction is reported in the income statement as an impairment loss. Value in use is calculated using estimated cash flows, generally over a five-year period, with extrapolating projections for subsequent years. These are discounted using an appropriate long-term interest rate. When an impairment loss arises, the useful life of the asset is reviewed and, if necessary, the future depreciation/amortisation charge is accelerated. If the amount of impairment loss subsequently decreases and the decrease can be related objectively to an event occurring after the impairment was recognised, then the previously recognised impairment loss is reversed through the income statement as an impairment reversal.

Impairment of goodwill

Goodwill is assessed for impairment at each reporting date and is additionally tested annually for impairment. Goodwill is allocated to cash-generating units and when the recoverable amount of the cash-generating unit, being the higher of its fair value less costs of disposal or its value in use, is less than its carrying value, then the carrying value of the goodwill is reduced to its recoverable amount. This reduction is reported in the income statement as an impairment loss. When an acquired business that is included within a cash-generating unit permanently ceases to operate then it is treated as a disposal of that business. For separately identifiable goodwill that was generated on the initial acquisition of that business and where all of the factors that made up that goodwill are entirely unrelated to the continuing operations of the cash-generating unit, then the goodwill is deemed to have been disposed of and is fully impaired. The impairment testing methodology is further described in Note 9.

Inventories

Inventories are stated at the lower of cost and net realisable value. The cost of finished goods, work in process and intermediates includes raw materials, direct labour and other directly attributable costs and overheads based upon the normal capacity of production facilities. Cost is determined using the weighted average method. Net realisable value is the estimated selling price less cost to completion and selling expenses.

Receivables, including accounts receivable

Receivables are carried at the original invoice amount less allowances made for doubtful accounts, trade discounts, cash discounts, volume rebates and similar allowances. A receivable represents a right to consideration that is unconditional and excludes contract assets. An allowance for doubtful accounts is recorded for expected credit losses over the term of the receivables. These estimates are based on specific indicators, such as the ageing of customer balances, specific credit circumstances and the Group's historical loss rates for each category of customers, and adjusted for forward-looking macroeconomic data. Expenses for doubtful trade receivables are recognised within marketing and distribution expenses. Trade discounts, cash discounts, volume rebates and similar allowances are recorded on an accrual basis consistent with the recognition of the related sales, using estimates based on existing contractual obligations, historical trends and the Group's experience.

Receivables are written off (either partly or in full) when there is no reasonable expectation of recovery. Where receivables have been written off, the Group continues to engage in enforcement activities to attempt to recover the receivable due. Where recoveries are made, these are recognised in profit or loss.

For trade and lease receivables, the Group applies the simplified approach prescribed by IFRS 9, which requires/permits the use of the lifetime expected loss provision from initial recognition of the receivables. The Group measures an allowance for doubtful accounts equal to the credit losses expected over the lifetime of the trade and lease receivables.

Cash and cash equivalents

Cash and cash equivalents include cash on hand and time, call and current balances with banks and similar institutions. Such balances are only reported as cash equivalents if they are readily convertible to known amounts of cash, are subject to insignificant risk of changes in their fair value and have a maturity of three months or less from the date of acquisition.

Provisions and contingencies

Provisions are recognised where a legal or constructive obligation has been incurred which will probably lead to an outflow of resources that can be reliably estimated. In particular, restructuring provisions are recognised when the Group has a detailed formal plan that has either commenced implementation or has been announced. Provisions are recorded for the estimated ultimate liability that is expected to arise and are discounted when the time value of money is material. A contingent liability is disclosed where the existence of the obligation will only be confirmed by future events or where the amount of the obligation cannot be measured with reasonable reliability. Contingent assets are not recognised, but are disclosed where an inflow of economic benefits is probable.

Fair values

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. It is determined by reference to quoted market prices or by the use of established valuation techniques such as option pricing models and the discounted cash flow method if quoted prices in an active market are not available.

Financial instruments

The Group classifies its financial instruments in the following measurement categories which are disclosed in Note 31: amortised cost; fair value through OCI; fair value through OCI – equity investments; or fair value through profit or loss (including hedging instruments).

The classification depends on the Group's business model for managing the financial assets and the contractual terms of the cash flows. The Group reclassifies debt securities and financial assets at amortised cost when and only when its business model for managing those assets changes.

At initial recognition, the Group measures a financial asset at its fair value plus, in the case of a financial asset not at fair value through profit or loss, transaction costs that are directly attributable to the acquisition of the financial asset. Transaction costs of financial assets carried at fair value through profit or loss are expensed in profit or loss.

Amortised cost. Assets that are held for collection of contractual cash flows where those cash flows represent solely payments of principal and interest are measured at amortised cost, less provision for impairment. A gain or loss on a debt security that is subsequently measured at amortised cost and is not part of a hedging relationship is recognised in profit or loss when the asset is derecognised or impaired. Interest income from these financial assets is included in other financial income using the effective interest rate method. Assets at amortised cost are mainly comprised of accounts receivable, cash and cash equivalents and time accounts over three months.

Fair value through other comprehensive income (fair value through OCI). These are financial assets that are held for collection of contractual cash flows and for selling the financial assets, where the assets' cash flows represent solely payments of principal and interest. Those are initially recorded and subsequently carried at fair value. Changes in the fair value are recorded in other comprehensive income, except for the recognition of impairment gains or losses, interest revenue and foreign exchange gains and losses which are recognised in profit or loss. When the financial asset is derecognised, the cumulative gain or loss previously recognised in OCI is reclassified from equity to profit or loss. Interest income from these financial assets is included in other financial income using the effective interest rate method. Fair value through other comprehensive income assets are mainly comprised of money market instruments and debt securities.

Equity investments at fair value through other comprehensive income (fair value through OCI). These are equity investments in private biotechnology companies, which are kept as part of the Group's strategic alliance efforts. These assets are subsequently measured at fair value. Dividends are recognised as other financial income in profit or loss unless the dividend clearly represents a recovery of part of the cost of the investment. Other net gains and losses are recognised in OCI and included in the fair value reserve. When such an asset is derecognised, the cumulative gain or loss previously recognised in OCI is reclassified within equity from the fair value reserve to retained earnings and never to profit or loss.

Fair value through profit or loss. These are financial assets whose performance is evaluated on a fair value basis. A gain or loss on a financial asset that is subsequently measured at fair value through profit or loss and is not part of a hedging relationship is recognised in profit or loss and presented within other financial income (expense) in the period in which it arises. Fair value through profit or loss assets are mainly comprised of equity investments/securities. Contingent consideration liabilities are initially recorded and subsequently carried at fair value with changes in fair value recorded in general and administration within the operating results of the income statement.

Fair value through profit or loss – hedging instruments. These are derivative financial instruments that are used to manage the exposures to foreign currency, interest rate, equity market and credit risks. These instruments are initially recorded and subsequently carried at fair value. Apart from those derivatives designated as qualifying cash flow hedging instruments, all changes in fair value are recorded as other financial income (expense).

Other financial liabilities. These are non-derivative financial liabilities. Other financial liabilities are initially recorded at fair value, less transaction costs, and subsequently carried at amortised cost using the effective interest rate method. Other financial liabilities are mainly comprised of debt and trade payables.

Debt. Debt instruments are initially recorded at cost, which is the proceeds received, net of transaction costs. Subsequently they are reported at amortised cost. Any discount between the net proceeds received and the principal value due on redemption is amortised over the duration of the debt instrument and is recognised as part of financing costs using the effective interest rate method.

Derecognition. A financial asset is derecognised when the contractual cash flows from the asset expire or when the Group transfers the rights to receive the contractual cash flows from the financial assets in a transaction in which substantially all the risks and rewards of ownership of the financial asset are transferred. A financial liability is derecognised when the contractual obligations are discharged, cancelled or expire.

Impairment of financial assets

The Group recognises loss allowances for expected credit losses ('ECL') for financial assets measured at amortised cost and debt securities measured at fair value through OCI.

For trade and lease receivables the Group measures the allowance for doubtful accounts at an amount equal to lifetime ECL.

For debt securities carried at fair value through OCI and debt securities and other financial assets at amortised cost, which are determined to have low credit risk based on external credit ratings of the counterparties, the Group measures loss allowances at an amount equal to 12-month ECL. The Group considers debt securities to have low credit risk when their credit risk rating is equivalent to the globally understood definition of 'investment grade'. The Group considers this to be at least Baa3 from Moody's and BBB- from Standard & Poor's. When the credit risk of debt securities carried at fair value through OCI and debt securities and other financial assets at amortised cost has increased significantly since their initial recognition, the Group measures loss allowances at an amount equal to lifetime ECL. The Group assumes that the credit risk of such instruments have increased significantly if they are more than 30 days past due.

Financial assets are written off (either partially or in full) when there is no realistic prospect of recovery. This is generally the case when the Group determines that the customer does not have assets or sources of income that could generate sufficient cash flows to repay the amounts subject to the write-off. However, financial assets that are written off are still subject to enforcement activities in order to comply with the Group's policy for recovery of amounts due.

Hedge accounting

The Group uses derivatives to manage its exposures to foreign currency, interest rate, equity market and credit risks. The instruments used may include interest rate swaps, cross-currency swaps, forwards contracts and options. The Group generally limits the use of hedge accounting to certain significant transactions. To qualify for hedge accounting, the hedging relationship must meet several strict conditions on eligibility of hedging and hedged instruments, formal designation and documentation, as well as hedge effectiveness and reliability of measurement. While many of these transactions can be considered as hedges in economic terms, if the required conditions are not met, then the relationship does not qualify for hedge accounting. In this case the hedging instrument and the hedged item are reported independently as if there were no hedging relationship, which means that any derivatives are reported at fair value, with changes in fair value included in other financial income (expense).

Cash flow hedge. This is a hedge of the exposure to variability in cash flows that is attributable to a particular risk associated with a recognised asset or liability or a highly probable forecasted transaction and could affect profit or loss. The hedging instrument is recorded at fair value. The effective portion of the hedge is included in other comprehensive income and any ineffective portion is reported in other financial income (expense). If the hedging relationship is the hedge of the foreign currency risk of a firm commitment or highly probable forecasted transaction that results in the recognition of a non-financial item, the cumulative changes in the fair value of the hedging instrument that have been recorded in other comprehensive income are included in the initial carrying value of the non-financial item at the date of recognition. For all other cash flow hedges, the cumulative changes in the fair value of the hedging instrument that have been recorded in other comprehensive income are included in other financial income (expense) when the forecasted transaction affects net income.

Fair value hedge. This is a hedge of the exposure to changes in fair value of a recognised asset or liability, or an unrecognised firm commitment, or an identified portion of such an asset, liability or firm commitment, that is attributable to a particular risk and could affect profit or loss. The hedging instrument is recorded at fair value and the hedged item is recorded at its previous carrying value, adjusted for any changes in fair value that are attributable to the hedged risk. Changes in the fair values are reported in other financial income (expense).

Taxation

Income taxes include all taxes based upon the taxable profits of the Group, including withholding taxes payable on the distribution of retained earnings within the Group. Other taxes not based on income, such as property and capital taxes, are included within general and administration expenses.

Liabilities for income taxes, mainly withholding taxes, which could arise on the remittance of retained earnings, principally relating to subsidiaries, are only recognised where it is probable that such earnings will be remitted in the foreseeable future. Where the amount of tax liabilities is uncertain, accruals are recorded within income tax liabilities for management's best estimate of the ultimate liability that is expected to arise based on the specific circumstances and the Group's historical experience.

Deferred tax assets and liabilities are recognised on temporary differences between the tax bases of assets and liabilities and their carrying values. Deferred tax assets are recognised to the extent that it is probable that future taxable profit will be available against which the unused tax losses can be utilised.

Current and deferred tax assets and liabilities are offset when the income taxes are levied by the same taxation authority and when there is a legally enforceable right to offset them. Deferred taxes are determined based on the currently enacted tax rates applicable in each tax jurisdiction where the Group operates.

Own equity instruments

The Group's holdings in its own equity instruments are recorded as a deduction from equity. The original purchase cost, consideration received for subsequent resale of these equity instruments and other movements are reported as changes in equity. These instruments are held for the Group's potential conversion obligations that may arise from the Group's equity compensation plans.

Changes in accounting policies

In 2020 the Group has implemented various minor amendments to existing standards and interpretations, which have no material impact on the Group's overall results and financial position. The amendments to IFRS 3 'Business Combinations' on the definition of a business, which are mandatorily applicable in 2020, were early adopted by the Group in 2018.

Future new and revised standards

The Group is currently assessing the potential impacts of the various new and revised standards and interpretations that will be mandatory from 1 January 2021 which the Group has not yet applied. Based on an analysis to date, the Group does not anticipate that these will have a material impact on the Group's overall results and financial position. The Group is also assessing other new and revised standards which are not mandatory until after 2021.

Report of Roche Management on Internal Control over Financial Reporting

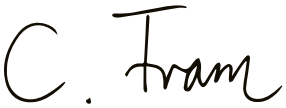
Report of Roche Management on Internal Control over Financial Reporting

The Board of Directors and management of Roche Holding Ltd are responsible for establishing and maintaining adequate control over financial reporting. The internal control system was designed to provide reasonable assurance over the reliability of financial reporting and the preparation and fair presentation of consolidated financial statements in accordance with International Financial Reporting Standards.

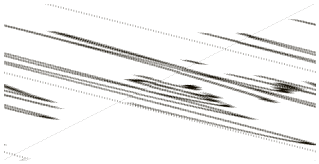
All internal control systems, no matter how well designed, have inherent limitations. Therefore, even those systems determined to be effective may not prevent or detect misstatements and can provide only reasonable assurance with respect to financial statement preparation and presentation. Also, projections 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.

Management assessed the effectiveness of its system of internal control over financial reporting as of 31 December 2020 based on the criteria for effective internal control over financial reporting described in *Internal Control – Integrated Framework 2013* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, management has concluded that the system of internal control over financial reporting was effective as of 31 December 2020.

The Statutory Auditor KPMG AG has audited the consolidated financial statements of Roche Holding Ltd for the year ended 31 December 2020, in accordance with Swiss Auditing Standards and with the International Standards on Auditing (ISA).



Christoph Franz
Chairman of the Board of Directors



Alan Hippe
Chief Financial Officer

Basel, 1 February 2021

Statutory Auditor's Report

To the General Meeting of Roche Holding Ltd, Basel

Report on the Audit of the Consolidated Financial Statements

Opinion

We have audited the consolidated financial statements of Roche Holding Ltd and its subsidiaries (the Group), which comprise the consolidated balance sheet as at 31 December 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 48–155) give a true and fair view of the consolidated financial position of the Group as at 31 December 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 Ethics Standards Board for Accountants' International Code of Ethics for Professional Accountants (including International Independence Standards) (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.

Key Audit Matters

Chargebacks, other rebates and sales returns in the US pharmaceuticals business

Carrying value of product intangible assets

Income tax – uncertain tax positions

Acquisition of Spark Therapeutics, Inc.

Key audit matters are those matters that, in our professional judgement, 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.

KPMG

Chargebacks, other rebates and sales returns in the US pharmaceuticals business

Key Audit Matter

The Group's pharmaceuticals business makes sales to various customers in the US that fall under certain commercial and government-mandated contracts, purchasing and reimbursement arrangements, of which the most significant are Medicaid and the 340B Drug Discount Program. The Group also provides a right of return to its US customers for certain products, with return periods that in some cases extend several years into the future. These arrangements result in deductions to gross amounts invoiced in arriving at revenue and create obligations for the Group to provide customers with credits, chargebacks or rebate payments. The estimated amounts are deducted from gross sales and recorded as accrued liabilities (rebates) or provisions for sales returns, or as a deduction from accounts receivable (chargebacks). These estimates are based on analyses of existing contractual or legislatively mandated obligations, recent trends and historical experience.

Management has determined accrued liabilities and deductions to accounts receivable for expected chargebacks and other rebates, predominantly Medicaid, of CHF 1,335 million to be necessary at 31 December 2020. Additionally, provisions for sales returns mainly relating to products at or near loss of exclusivity of CHF 416 million were recorded at 31 December 2020.

We focused on this area because the arrangements are complex and because establishing an appropriate year-end position requires significant judgement and estimation by management. The assumptions required for estimating provisions for sales returns are also made more complicated given the recent loss of exclusivity in the US for some of the Group's pharmaceutical products.

Our response

Our audit procedures included, amongst others, on a sample basis, obtaining management's calculations for accrued liabilities, provisions and accounts receivable deductions, testing the accuracy of the calculations and assessing the appropriateness of key inputs and assumptions used in the estimates. In performing our assessment, we referenced internal and external sources of information, including the terms of the applicable contracts, US government pricing information, historical rates of chargebacks and other rebates, historical rates of sales returns and consideration of current trends.

We also evaluated the accuracy of management's estimates by comparing rates used in historical estimates to the rates of actual rebate payments and chargebacks. We assessed changes in the accrual rates used within the estimates for 2020 by comparing the accrual rates to current chargeback, other rebate payment and sales return trends.

We also evaluated the appropriateness of the Group's revenue recognition accounting policies, including the recognition and measurement of deductions to gross sales relating to chargebacks, other rebates and sales returns and related disclosures.

For further information on chargebacks, other rebates and sales returns in the US pharmaceuticals business refer to the following:

Page 146 (Significant accounting policies, note 34), page 54 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 62, 85 and 88–94 (Financial disclosures, note 3 Revenue, note 12 Accounts receivable, note 19 Other current liabilities and note 20 Provisions and contingent liabilities).

KPMG

Carrying value of product intangible assets

Key Audit Matter

The Group has significant product intangible assets (31 December 2020 – CHF 11,567 million) acquired through business combinations, asset acquisitions or in-licensing arrangements. These comprise product intangibles in use (CHF 5,669 million) being amortised and product intangibles not available for use (CHF 5,898 million) not being amortised. An impairment assessment is carried out for all product intangibles when there is evidence that an asset may be impaired, with intangible assets that are not yet available for use also being tested for impairment annually.

Product intangibles in use (CHF 5,669 million) predominantly relate to acquired products that have been launched, with the key risk being the ability to successfully commercialise the products concerned. Key estimates and assumptions include revenue growth, the timing and impact of loss of exclusivity, discount rates and the development and commercialisation of competing products. The drivers of revenue growth include persistence rate, treatment rate and market share.

Product intangibles not available for use (CHF 5,898 million) mostly represent in-process research and development assets. Due to the inherent uncertainties in the research and development processes, intangible assets not available for use are particularly at risk of impairment. The impairment assessment requires management to make key assumptions and judgements on the clinical, technical and commercial viability of the new products. Accordingly, we also focused our audit work on these areas. Risks include an inability to achieve successful trial results, obtain required clinical and/or regulatory approvals and a highly competitive business environment in the therapeutic areas where the Group has significant assets in research or development.

Our response

Our audit procedures included, amongst others, challenging the robustness of the key assumptions used to determine the recoverable amounts, including forecast revenues, useful lives and the discount rates. Our challenge was based on our understanding of the commercial prospects of the individual products, as well as the relevant business areas and markets in which they operate. We used our valuation specialists to assist us in evaluating the assumptions and methodologies used by management in relation to the discount rates. We assessed the key inputs such as projected pricing and volumes, and the products' projected share of the therapeutic area or *in vitro* diagnostic market, by comparing relevant assumptions to industry forecasts, reviewing analyst commentaries and by retrospective assessment of the accuracy of previous projections. We compared management's assumptions with external data where it was available. We performed sensitivity analysis over individual intangible asset impairment models to assess the level of sensitivity to key assumptions so we could focus our work on those areas and assess management's allowance for risk.

In addition, for product intangibles not yet available for use, our audit included assessing the reasonableness of management's assumptions regarding the probability of obtaining regulatory approval through comparison to industry practice, past history, and consideration of the Group's internal governance and approval processes.

For further information on the carrying value of product intangible assets refer to the following:

Page 146 (Significant accounting policies, note 34), page 54 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 81–84 (Financial disclosures, note 10 Intangible assets).

KPMG

Income tax – uncertain tax positions

Key Audit Matter

The Group operates across a wide range of different tax jurisdictions around the world and thus its tax treatments in tax filings are subject to challenge by local tax authorities in respect of cross-border transfer pricing arrangements for goods and services, financing and transaction-related tax matters in connection with the integration of investments, divestments and licensing contracts. Tax treatments involving uncertainty include agreements and transfer pricing arrangements between affiliates involved in the Group's global manufacturing supply chains.

Where it is not probable that the tax authority will accept a treatment, the tax liability recognised in the financial statements reflects management's best estimate of the outcome based on the facts known in the relevant jurisdiction. The Group has open tax and transfer pricing matters with various tax authorities where the range of possible outcomes is broad. At 31 December 2020, the Group has recognised current income tax liabilities of CHF 3,679 million which includes accruals for uncertain tax positions.

We focused on this area as there is uncertainty regarding the estimates of the amounts of tax receivable or payable, and these therefore require a significant level of expertise and judgement.

Our response

Our audit procedures included, amongst others, obtaining an understanding of uncertain tax positions through inquiry of employees of the tax department and management of affiliates. We inspected documentation in relation to tax exposure items including correspondence with tax authorities and reports issued by tax advisors to verify whether uncertain tax positions have been considered and provided for where necessary.

For significant items we challenged management's judgement regarding the eventual resolution of the uncertainties with the assistance of our local country tax specialists and re-performed the calculation of the estimated exposure. We inspected third-party transfer pricing studies and evaluated, where applicable, past experience of management's interactions with the tax authorities in the respective jurisdiction. Additionally, we used our own tax specialists' expertise to assess the appropriateness of the key assumptions made by management and to conclude on a best estimate of the outcome.

Our audit approach included additional audit procedures performed at Group level to consider uncertain tax positions arising for the Group in particular with respect to transfer pricing arrangements for goods and services and transaction-related tax matters.

For further information on uncertain tax positions refer to the following:

Page 146 (Significant accounting policies, note 34), page 54 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 66–68 (Financial disclosures, note 5 Income taxes).

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Acquisition of Spark Therapeutics, Inc.

Key Audit Matter

The Group acquired Spark Therapeutics, Inc. ('Spark') on 17 December 2019 for a total consideration of CHF 4,688 million. The consideration was primarily allocated to intangible assets (CHF 2,424 million) and a residual of CHF 2,306 million was recognised as goodwill.

Management was required to apply judgement in identifying and valuing the intangible assets and deferred tax assets in the purchase price allocation exercise and in the allocation of goodwill arising from the transaction to an appropriate cash-generating unit.

The key assumptions relating to the valuation of the intangible assets included probability of technical success, revenue forecasts considering the competitive environment, discount rate, cost of debt and tax rate.

The goodwill arising from the transaction was attributed to the Roche Pharmaceuticals cash-generating unit which reflects the benefits to the Group's research and development activities in the haemophilia treatment field as well as access to Spark's gene therapy expertise.

Our response

Our audit procedures in relation to the acquisition of Spark included, amongst others, an inspection of the legal agreements supporting the transaction. We also examined information contained within due diligence and valuation reports as well as internal management presentations to the Board of Directors.

We challenged the appropriateness of the methodology and assumptions used by management to value the identified intangible assets. With the support of our own valuation and tax specialists we evaluated the appropriateness of the discount rate, the cost of debt and the tax rate applied. Our life science expert assisted us in challenging key assumptions made by management in determining the revenue growth, probability of technical success and competitive environment, specifically as it relates to the two largest intangible assets identified.

We challenged the key assumptions based on our sector expertise and with reference to available industry forecasts and analysts' commentaries. We compared management's assumptions with external data where it was available. We performed sensitivity analysis over key assumptions to identify those that were more likely to lead to a material misstatement so we could focus our work and assess management's allowance for risk. Throughout our procedures we challenged management's external valuers.

We obtained an understanding of Spark's integrated gene therapy platform that comprises multiple elements including in-licensed and in-house developed technologies, expertise and know-how of Spark personnel, and processes in the areas of vector design, vector manufacturing and investigational new drug enabling studies and regulatory processes for gene therapy. We challenged the level of goodwill recognised and assessed the appropriateness of management's decision to allocate the goodwill to the Roche Pharmaceuticals cash-generating unit based on expected synergies and how those would be used within the Roche business. We have also assessed whether the Group's disclosures in relation to the acquisition meet the requirements of the relevant accounting standards.

For further information on acquisition of Spark Therapeutics, Inc. refer to the following:

Page 146 (Significant accounting policies, note 34), page 54 (General accounting principles – Key accounting judgements, estimates and assumptions, note 1) and pages 69–72 (Financial disclosures, Mergers and acquisitions, note 6).

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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 stand-alone financial statements of the company, the remuneration report 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.

Responsibility of the Board of Directors for the Consolidated Financial Statements

The Board of Directors is responsible for the preparation of 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 scepticism 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, but not for the purpose of expressing an opinion on the effectiveness of the Group'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 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 or its relevant 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 or its relevant committee 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.

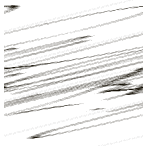
From the matters communicated with the Board of Directors or its relevant committee, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's 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 para. 1 item 3 CO and the 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.

KPMG AG



Mark Baillache
Licensed Audit Expert
Auditor in Charge

Marc Ziegler
Licensed Audit Expert

Basel, 1 February 2021

KPMG AG, Viaduktstrasse 42, PO Box 3456, CH-4002 Basel

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Multi-Year Overview and Supplementary Information

Multi-Year Overview

Statistics, as reported

	2011	2012	2013
Income statement in millions of CHF			
Sales	42,531	45,499	46,780
EBITDA	16,933	19,040	19,802
Operating profit	13,454	14,125	16,376
Net income attributable to Roche shareholders	9,343	9,539	11,164
Research and development	8,326	9,552	9,270
Balance sheet in millions of CHF			
Non-current assets	33,344	33,434	33,003
Current assets	28,232	31,371	29,164
Total assets	61,576	64,805	62,167
Non-current liabilities	(30,884)	(27,868)	(25,166)
Current liabilities	(16,210)	(20,209)	(15,760)
Total liabilities	(47,094)	(48,077)	(40,926)
Net assets	14,482	16,728	21,241
Capital and reserves attributable to Roche shareholders	12,095	14,494	19,294
Equity attributable to non-controlling interests	2,387	2,234	1,947
Additions to property, plant and equipment	2,006	2,130	2,458
Personnel			
Number of employees at end of year	80,129	82,089	85,080
Key ratios			
Net income attributable to Roche shareholders as % of sales	22	21	24
Net income attributable to Roche shareholders as % of equity	77	66	58
Research and development as % of sales	20	21	20
Current ratio %	174	155	185
Equity and non-controlling interests as % of total assets	24	26	34
Human capital return on investment ratio	2.31	2.25	2.45
Data on shares and non-voting equity securities			
Number of shares	160,000,000	160,000,000	160,000,000
Number of non-voting equity securities *(Genussscheine)*	702,562,700	702,562,700	702,562,700
Total shares and non-voting equity securities	862,562,700	862,562,700	862,562,700
Total dividend in millions of CHF	5,865	6,340	6,728
Earnings per share and non-voting equity security (diluted) in CHF	10.98	11.16	12.93
Dividend per share and non-voting equity security in CHF	6.80	7.35	7.80

Information in this table is stated as reported and changes in accounting policies arising from changes in International Financial Reporting Standards are not applied retrospectively.

2014	2015	2016	2017	2018	2019	2020
47,462	48,145	50,576	53,299	56,846	61,466	58,323
19,558	19,479	20,483	21,201	22,825	25,419	24,281
14,090	13,821	14,069	13,003	14,769	17,548	18,543
9,332	8,863	9,576	8,633	10,500	13,497	14,295
9,895	9,581	11,532	11,292	12,092	12,774	13,009
44,426	47,581	48,149	45,104	46,273	51,837	53,196
31,114	28,182	28,670	31,572	32,244	31,254	32,942
75,540	75,763	76,819	76,676	78,517	83,091	86,138
(30,874)	(28,695)	(27,817)	(25,509)	(25,118)	(23,105)	(20,964)
(23,108)	(23,768)	(22,600)	(22,160)	(23,033)	(24,119)	(25,401)
(53,982)	(52,463)	(50,417)	(47,669)	(48,151)	(47,224)	(46,365)
21,558	23,300	26,402	29,007	30,366	35,867	39,773
19,586	20,979	23,911	26,441	27,622	32,747	36,341
1,972	2,321	2,491	2,566	2,744	3,120	3,432
2,905	4,077	3,790	3,477	3,796	3,479	3,693
88,509	91,747	94,052	93,734	94,442	97,735	101,465
20	18	19	16	19	22	25
48	42	40	33	38	41	39
21	20	23	21	21	21	22
135	119	127	142	140	130	130
29	31	34	38	39	43	46
2.16	2.06	2.06	1.89	1.96	2.07	2.18
160,000,000	160,000,000	160,000,000	160,000,000	160,000,000	160,000,000	160,000,000
702,562,700	702,562,700	702,562,700	702,562,700	702,562,700	702,562,700	702,562,700
862,562,700	862,562,700	862,562,700	862,562,700	862,562,700	862,562,700	862,562,700
6,901	6,987	7,073	7,159	7,504	7,763	7,849[a]
10.81	10.28	11.13	10.04	12.21	15.62	16.52
8.00	8.10	8.20	8.30	8.70	9.00	9.10[a]

a) 2020 dividend proposed by the Board of Directors.

Sales by division in millions of CHF

	2016	2017	2018	2019	2020
Pharmaceuticals	39,103	41,220	43,967	48,516	44,532
Diagnostics	11,473	12,079	12,879	12,950	13,791
Total	**50,576**	**53,299**	**56,846**	**61,466**	**58,323**

Sales by geographical area in millions of CHF

	2016	2017	2018	2019	2020
Switzerland	577	574	627	590	670
Germany	3,004	3,041	3,147	3,050	3,323
Rest of Europe	10,264	10,135	9,828	9,654	9,780
Europe	**13,845**	**13,750**	**13,602**	**13,294**	**13,773**
United States	21,192	23,122	26,105	29,724	27,187
Rest of North America	851	897	931	985	882
North America	**22,043**	**24,019**	**27,036**	**30,709**	**28,069**
Latin America	2,681	3,024	2,870	2,858	2,393
Japan	4,211	4,214	4,175	4,545	4,156
Rest of Asia	6,461	6,824	7,689	8,701	8,614
Asia	**10,672**	**11,038**	**11,864**	**13,246**	**12,770**
Africa, Australia and Oceania	1,335	1,468	1,474	1,359	1,318
Total	**50,576**	**53,299**	**56,846**	**61,466**	**58,323**

Additions to property, plant and equipment by division in millions of CHF

	2016	2017	2018	2019	2020
Pharmaceuticals	2,154	2,030	2,340	1,864	2,141
Diagnostics	1,629	1,443	1,376	1,552	1,502
Corporate	7	4	80	63	50
Total	**3,790**	**3,477**	**3,796**	**3,479**	**3,693**

Additions to property, plant and equipment by geographical area in millions of CHF

	2016	2017	2018	2019	2020
Switzerland	892	846	858	754	754
Germany	759	541	543	459	515
Rest of Europe	315	322	329	339	345
Europe	**1,966**	**1,709**	**1,730**	**1,552**	**1,614**
United States	1,060	844	900	900	987
Rest of North America	7	7	4	3	2
North America	**1,067**	**851**	**904**	**903**	**989**
Latin America	133	110	113	120	106
Japan	192	331	647	502	668
Rest of Asia	387	422	371	367	291
Asia	**579**	**753**	**1,018**	**869**	**959**
Africa, Australia and Oceania	45	54	31	35	25
Total	**3,790**	**3,477**	**3,796**	**3,479**	**3,693**

Alternative Performance Measures

The financial information included in the Financial Review includes certain Alternative Performance Measures (APMs) which are not accounting measures as defined by IFRS, in particular the core results, net working capital, net operating assets, free cash flow and constant exchange rates. These APMs should not be used instead of, or considered as alternatives to, the Group's consolidated financial results based on IFRS. These APMs may not be comparable to similarly titled measures disclosed by other companies. All APMs presented in the Financial Review relate to the performance of the current year and comparative periods.

Core results

Core results allow for an assessment of both the Group's actual results as defined by IFRS and the underlying performance of the business. The core results concept, which is used in the internal management of the business, is based on the IFRS results, with the following adjustments:

- Global restructuring plans (see Note 7) are excluded.
- Amortisation and impairment of intangible assets (see Note 10), excluding commercial software intangible assets, and impairment of goodwill (see Note 9) are excluded.
- Acquisition accounting and other impacts from the accounting for merger and acquisition transactions and alliance arrangements (see Financial Review) are excluded.
- Discontinued operations (currently none) are excluded.
- Legal and environmental cases (see Financial Review) are excluded.
- Global issues outside the healthcare sector beyond the Group's control are excluded.
- Material treasury items such as major debt restructurings (currently none) are excluded.
- Pension plan settlements (see Note 26) are excluded.
- The tax benefit recorded under IFRS in respect of Equity Compensation Plans (ECPs), which varies according to the price of the underlying equity, is replaced by a normalised tax benefit, being the IFRS 2 expense multiplied by the applicable tax rate (see Note 5).

The core results concept was further described on 22 October 2010 at an Investor Update teleconference, which is available for download at: http://www.roche.com/investors/ir_agenda/csr_151010.htm

The Group's IFRS results, including the divisional breakdown, are reconciled to the core results in the tables below. The calculation of Core EPS is also given in the tables below. Additional commentary to the adjustment items is given in the Financial Review.

Core results reconciliation – 2020 in millions of CHF

	IFRS	Global restructuring	Intangibles amortisation	Intangibles impairment	M&A and alliance transactions	Legal & environmental	Pension plan settlements	Global issues	Normalisation of ECP tax benefit	Core
Sales	58,323	–	–	–	–	–	–	–	–	58,323
Royalties and other operating income	2,020	0	–	–	–	–	–	–	–	2,020
Cost of sales	(16,177)	225	1,304	81	–	–	–	–	–	(14,567)
Marketing and distribution	(9,572)	178	33	0	–	–	–	–	–	(9,361)
Research and development	(13,009)	99	413	344	–	–	–	–	–	(12,153)
General and administration	(3,042)	407	–	247	9	(345)	(2)	–	–	(2,726)
Operating profit	**18,543**	**909**	**1,750**	**672**	**9**	**(345)**	**(2)**	**–**	**–**	**21,536**
Financing costs	(553)	0	–	–	7	7	–	–	–	(539)
Other financial income (expense)	(25)	–	–	–	–	–	–	–	–	(25)
Profit before taxes	**17,965**	**909**	**1,750**	**672**	**16**	**(338)**	**(2)**	**–**	**–**	**20,972**
Income taxes	(2,897)	(168)	(482)	(94)	(12)	67	0	0	(8)	(3,594)
Net income	**15,068**	**741**	**1,268**	**578**	**4**	**(271)**	**(2)**	**0**	**(8)**	**17,378**
Attributable to										
– Roche shareholders	14,295	719	1,262	578	4	(271)	(2)	0	(8)	16,577
– Non-controlling interests	773	22	6	0	–	0	0	0	–	801

Core results reconciliation – 2019 in millions of CHF

	IFRS	Global restructuring	Intangibles amortisation	Intangibles impairment	M&A and alliance transactions	Legal & environmental	Pension plan settlements	Global issues	Normalisation of ECP tax benefit	Core
Sales	61,466	–	–	–	–	–	–	–	–	61,466
Royalties and other operating income	2,285	0	–	–	–	–	–	–	–	2,285
Cost of sales	(18,351)	380	1,264	344	–	–	–	–	–	(16,363)
Marketing and distribution	(10,960)	405	41	1	–	–	–	–	–	(10,513)
Research and development	(12,774)	219	227	632	–	–	–	–	–	(11,696)
General and administration	(4,118)	202	–	779	(43)	481	(1)	–	–	(2,700)
Operating profit	**17,548**	**1,206**	**1,532**	**1,756**	**(43)**	**481**	**(1)**	**–**	**–**	**22,479**
Financing costs	(993)	0	–	–	14	17	–	–	–	(962)
Other financial income (expense)	59	–	–	–	–	–	–	–	–	59
Profit before taxes	**16,614**	**1,206**	**1,532**	**1,756**	**(29)**	**498**	**(1)**	**–**	**–**	**21,576**
Income taxes	(2,506)	(236)	(152)	(186)	(23)	(81)	0	(236)	(94)	(3,514)
Net income	**14,108**	**970**	**1,380**	**1,570**	**(52)**	**417**	**(1)**	**(236)**	**(94)**	**18,062**
Attributable to										
– Roche shareholders	13,497	946	1,375	1,570	(52)	411	(1)	(236)	(94)	17,416
– Non-controlling interests	611	24	5	0	–	6	0	0	–	646

Divisional core results reconciliation – 2020 in millions of CHF

	IFRS	Global restructuring	Intangibles amortisation	Intangibles impairment	M&A and alliance transactions	Legal & environmental	Pension plan settlements	Core
Pharmaceuticals								
Sales	44,532	–	–	–	–	–	–	44,532
Royalties and other operating income	1,959	0	–	–	–	–	–	1,959
Cost of sales	(9,483)	122	1,210	81	–	–	–	(8,070)
Marketing and distribution	(6,796)	139	24	0	–	–	–	(6,633)
Research and development	(11,421)	75	405	344	–	–	–	(10,597)
General and administration	(1,639)	237	–	0	34	(344)	(2)	(1,714)
Operating profit	**17,152**	**573**	**1,639**	**425**	**34**	**(344)**	**(2)**	**19,477**
Diagnostics								
Sales	13,791	–	–	–	–	–	–	13,791
Royalties and other operating income	61	0	–	–	–	–	–	61
Cost of sales	(6,694)	103	94	0	–	–	–	(6,497)
Marketing and distribution	(2,776)	39	9	0	–	–	–	(2,728)
Research and development	(1,588)	24	8	0	–	–	–	(1,556)
General and administration	(793)	56	–	247	(25)	8	0	(507)
Operating profit	**2,001**	**222**	**111**	**247**	**(25)**	**8**	**0**	**2,564**
Corporate								
General and administration	(610)	114	–	–	0	(9)	0	(505)
Operating profit	**(610)**	**114**	**–**	**–**	**0**	**(9)**	**0**	**(505)**

Divisional core results reconciliation – 2019 in millions of CHF

	IFRS	Global restructuring	Intangibles amortisation	Intangibles impairment	M&A and alliance transactions	Legal & environmental	Pension plan settlements	Core
Pharmaceuticals								
Sales	48,516	–	–	–	–	–	–	48,516
Royalties and other operating income	2,198	0	–	–	–	–	–	2,198
Cost of sales	(11,593)	260	1,153	0	–	–	–	(10,180)
Marketing and distribution	(7,905)	267	33	1	–	–	–	(7,604)
Research and development	(11,221)	141	220	632	–	–	–	(10,228)
General and administration	(2,049)	68	–	0	80	215	(1)	(1,687)
Operating profit	**17,946**	**736**	**1,406**	**633**	**80**	**215**	**(1)**	**21,015**
Diagnostics								
Sales	12,950	–	–	–	–	–	–	12,950
Royalties and other operating income	87	0	–	–	–	–	–	87
Cost of sales	(6,758)	120	111	344	–	–	–	(6,183)
Marketing and distribution	(3,055)	138	8	0	–	–	–	(2,909)
Research and development	(1,553)	78	7	0	–	–	–	(1,468)
General and administration	(1,429)	5	–	779	(123)	257	0	(511)
Operating profit	**242**	**341**	**126**	**1,123**	**(123)**	**257**	**0**	**1,966**
Corporate								
General and administration	(640)	129	–	–	0	9	0	(502)
Operating profit	**(640)**	**129**	**–**	**–**	**0**	**9**	**0**	**(502)**

Core EPS (basic)

	2020	2019
Core net income attributable to Roche shareholders (CHF millions)	16,577	17,416
Weighted average number of shares and non-voting equity securities in issue used to calculate basic earnings per share (millions)[29]	855	856
Core earnings per share (basic) (CHF)	**19.40**	**20.35**

Core EPS (diluted)

	2020	2019
Core net income attributable to Roche shareholders (CHF millions)	16,577	17,416
Increase in non-controlling interests' share of core net income, assuming all outstanding Chugai stock options exercised (CHF millions)	(1)	(2)
Net income used to calculate diluted earnings per share (CHF millions)	**16,576**	**17,414**
Weighted average number of shares and non-voting equity securities in issue used to calculate diluted earnings per share (millions)[29]	**865**	**864**
Core earnings per share (diluted) (CHF)	**19.16**	**20.16**

Free cash flow

Free cash flow is used to assess the Group's ability to generate the cash required to conduct and maintain its operations. It also indicates the Group's ability to generate cash to finance dividend payments, repay debt and to undertake merger and acquisition activities. The free cash flow concept is used in the internal management of the business.

Operating free cash flow is calculated based on the IFRS operating profit and adjusted for certain non-cash items, movements in net working capital and capital expenditures (investments in property, plant and equipment and intangible assets as well as the principal portion of lease liabilities paid for leased assets). Operating free cash flow is different from cash flows from operating activities as defined by IAS 7 in that it includes capital expenditures (which are within the responsibility of divisional management) and excludes income taxes paid (which are not within the responsibility of divisional management). Cash outflows from defined benefit plans are allocated to the operating free cash flow based on the current service cost with the residual allocated to treasury activities.

Free cash flow is calculated as the operating free cash flow adjusted for treasury activities and taxes paid. Free cash flow is different from total cash flows as defined by IAS 7 in that it excludes dividend payments, cash inflows/outflows from financing activities such as issuance/repayment of debt, purchase/sale of marketable securities and cash inflows/outflows from mergers, acquisitions and divestments.

Operating free cash flow and free cash flow are calculated as shown in the tables below. Additional commentary to the adjustment items is given in the Financial Review.

Operating free cash flow reconciliation in millions of CHF

	2020	2019
Cash flows from operating activities (IFRS basis in accordance with IAS 7)	**18,566**	**22,385**
Add back		
– Income taxes paid	3,236	3,543
Deduct		
– Investments in property, plant and equipment	(3,528)	(3,503)
– Principal portion of lease liabilities paid	(369)	(372)
– Investments in intangible assets	(3,162)	(1,393)
– Disposal of property, plant and equipment	70	71
– Disposal of intangible assets	0	2
Pensions and other post-employment benefits		
– Add back total payments for defined benefit plans	601	676
– Deduct allocation of payments to operating free cash flow	(657)	(578)
Acquisition-related items, including transaction costs	58	91
Other operating items	0	(1)
Operating free cash flow	**14,815**	**20,921**

Free cash flow reconciliation in millions of CHF

	2020	2019
Cash flows from operating activities (IFRS basis in accordance with IAS 7)	**18,566**	**22,385**
Deduct		
– Investments in property, plant and equipment	(3,528)	(3,503)
– Principal portion of lease liabilities paid	(369)	(372)
– Investments in intangible assets	(3,162)	(1,393)
– Disposal of property, plant and equipment	70	71
– Disposal of intangible assets	0	2
– Interest paid	(422)	(624)
Other operating items, including acquisition-related items	58	90
Other treasury items	(270)	108
Free cash flow	**10,943**	**16,764**

Supplementary information used to calculate the divisional operating free cash flow is shown in the table below.

Divisional operating free cash flow information in millions of CHF

	Pharmaceuticals		Diagnostics		Corporate		Group	
	2020	2019	2020	2019	2020	2019	2020	2019
Depreciation, amortisation and impairment								
Depreciation of property, plant and equipment	1,263	1,227	1,127	1,109	61	73	2,451	2,409
Depreciation of right-of-use assets	236	229	112	112	9	10	357	351
Amortisation of intangible assets	1,639	1,406	111	126	–	–	1,750	1,532
Impairment (reversal) of property, plant and equipment	(30)	246	4	13	0	2	(26)	261
Impairment (reversal) of right-of-use assets	2	(12)	3	0	0	0	5	(12)
Impairment of goodwill	0	0	247	779	–	–	247	779
Impairment of intangible assets	425	633	0	344	–	–	425	977
Total	**3,535**	**3,729**	**1,604**	**2,483**	**70**	**85**	**5,209**	**6,297**
Other adjustments								
Add back								
– Expenses for equity-settled equity compensation plans	559	464	102	92	52	41	713	597
– Net (income) expense for provisions	181	1,259	250	390	28	36	459	1,685
– Net (gain) loss from disposals	(224)	(456)	5	(11)	0	(1)	(219)	(468)
– Non-cash working capital and other items	63	454	198	133	(1)	(8)	260	579
Deduct								
– Utilisation of provisions	(1,048)	(480)	(228)	(221)	(64)	(60)	(1,340)	(761)
– Proceeds from disposals	247	497	61	65	1	1	309	563
Total	**(222)**	**1,738**	**388**	**448**	**16**	**9**	**182**	**2,195**
Operating profit cash adjustments	**3,313**	**5,467**	**1,992**	**2,931**	**86**	**94**	**5,391**	**8,492**

EBITDA

The Group does not use Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA) in either its internal management reporting or its external communications. In the opinion of the Group's management, operating free cash flow gives a more useful and consistent measurement of 'cash earnings' than EBITDA, which includes many non-cash items such as provisions, allowances for trade receivables and inventories, and certain non-cash entries arising from acquisition accounting and pension accounting. Operating free cash flow also includes the cash used for investments in property, plant and equipment, leased assets and intangible assets, whereas EBITDA excludes all costs and cash outflows for these items.

For the convenience of those readers who do use EBITDA, this is provided in the table below. As the starting point this uses the core results, which already exclude the amortisation and impairment of goodwill and intangible assets.

EBITDA (using core results) in millions of CHF

	Pharmaceuticals		Diagnostics		Corporate		Group	
	2020	2019	2020	2019	2020	2019	2020	2019
EBITDA								
Core operating profit	19,477	21,015	2,564	1,966	(505)	(502)	21,536	22,479
Depreciation and impairment of property, plant and equipment – Core basis	1,230	1,410	1,098	1,105	61	75	2,389	2,590
Depreciation and impairment of right-of-use assets – Core basis	235	228	112	112	9	10	356	350
EBITDA	**20,942**	**22,653**	**3,774**	**3,183**	**(435)**	**(417)**	**24,281**	**25,419**
– margin, % of sales	47.0	46.7	27.4	24.6	–	–	41.6	41.4

Net operating assets

Net operating assets allow for an assessment of the Group's operating performance of the business independently from financing and tax activities. Net operating assets are calculated as property, plant and equipment, leased assets ('right-of-use assets'), goodwill, intangible assets, net working capital and long-term net operating assets minus provisions.

The calculation of the net operating assets disclosed in Note 2 of the Annual Financial Statements is shown in the tables below.

Net operating assets reconciliation – 2020 in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Treasury and taxation	Group
Property, plant and equipment	15,270	6,640	248	–	22,158
Right-of-use assets	801	276	35	–	1,112
Goodwill	5,575	3,674	–	–	9,249
Intangible assets	10,964	1,053	–	–	12,017
Inventories	4,208	2,986	–	–	7,194
Provisions	(2,108)	(932)	(249)	–	(3,289)
Current income tax net liabilities	–	–	–	(3,530)	(3,530)
Deferred tax net assets	–	–	–	5,106	5,106
Defined benefit plan net liabilities	–	–	–	(6,864)	(6,864)
Lease liabilities	–	–	–	(1,195)	(1,195)
Marketable securities	–	–	–	6,607	6,607
Cash and cash equivalents	–	–	–	5,727	5,727
Debt	–	–	–	(14,216)	(14,216)
Other net assets (liabilities)					
– Net working capital	(1,754)	(9)	(229)	–	(1,992)
– Other long-term net operating assets	515	76	9	–	600
– Other	–	–	–	1,089	1,089
Total net assets	**33,471**	**13,764**	**(186)**	**(7,276)**	**39,773**

Net operating assets reconciliation – 2019 in millions of CHF

	Pharmaceuticals	Diagnostics	Corporate	Treasury and taxation	Group
Property, plant and equipment	15,306	6,598	269	–	22,173
Right-of-use assets	801	303	41	–	1,145
Goodwill	6,097	4,198	–	–	10,295
Intangible assets	9,919	832	–	–	10,751
Inventories	3,696	2,359	–	–	6,055
Provisions	(3,140)	(958)	(302)	–	(4,400)
Current income tax net liabilities	–	–	–	(3,601)	(3,601)
Deferred tax net assets	–	–	–	4,681	4,681
Defined benefit plan net liabilities	–	–	–	(6,535)	(6,535)
Lease liabilities	–	–	–	(1,219)	(1,219)
Marketable securities	–	–	–	5,783	5,783
Cash and cash equivalents	–	–	–	6,075	6,075
Debt	–	–	–	(14,363)	(14,363)
Other net assets (liabilities)					
– Net working capital	(2,255)	383	(240)	–	(2,112)
– Other long-term net operating assets	365	63	(13)	–	415
– Other	–	–	–	724	724
Total net assets	**30,789**	**13,778**	**(245)**	**(8,455)**	**35,867**

Net debt

Net debt is used to monitor the Group's overall short- and long-term liquidity. Net debt is calculated as the sum of total debt (long-term and short-term) less marketable securities, cash and cash equivalents.

Net debt calculations, including details of movements during the current year, are shown in the table on page 40 in the Financial Review.

Net working capital

Net working capital is used to assess the Group's efficiency in utilising assets and short-term liquidity. Net trade working capital is calculated as trade receivables and inventories minus trade payables. Net working capital is calculated as net trade working capital adjusted for other receivables and other payables.

Net working capital and net trade working capital calculations are shown in the tables on page 27 (Pharmaceuticals Division), page 33 (Diagnostics Division) and page 35 (Corporate) in the Financial Review.

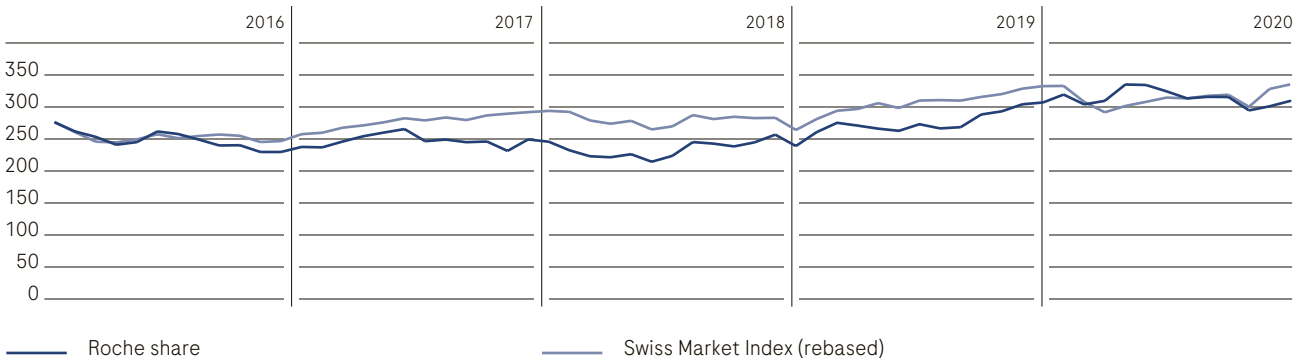
Constant exchange rates

Certain percentage changes in the Financial Review have been calculated using constant exchange rates (CER) which allow for an assessment of the Group's financial performance with the effects of exchange rate fluctuations eliminated. The percentage changes at constant exchange rates are calculated using simulations by reconsolidating both the current reported period and the prior period numbers at constant currency exchange rates, equalling the average exchange rates for the prior year. For example, a CER change between a 2020 line item and its 2019 equivalent is calculated using the average exchange rate for the year ended 31 December 2019 for both the 2020 line item and the 2019 line item and subsequently calculating the change in percent with respect to the two recalculated numbers.

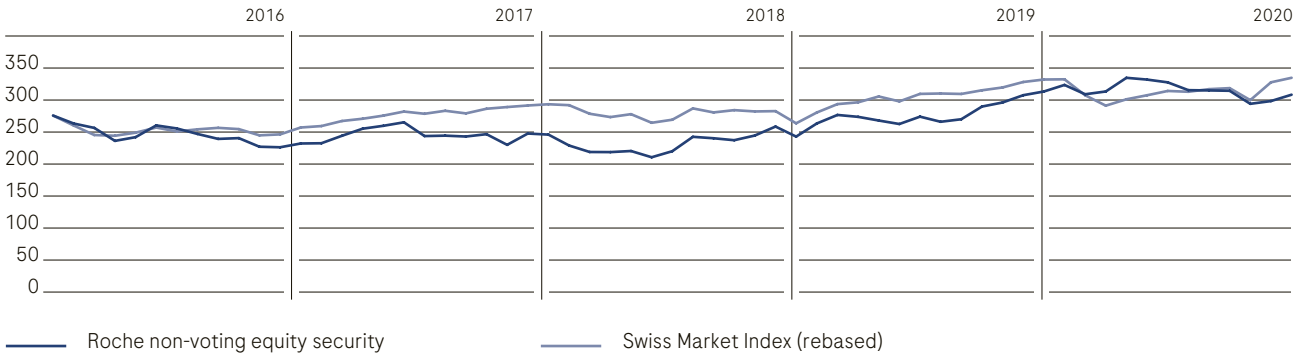
Foreign exchange gains and losses are excluded from the calculation of CER growth rates in the earnings per share disclosures. In countries where there is a significant devaluation in the local currency in the current year, the simulations use the average exchange rate of the current year instead of the prior year to avoid that CER growth rates are artificially inflated.

Roche Securities

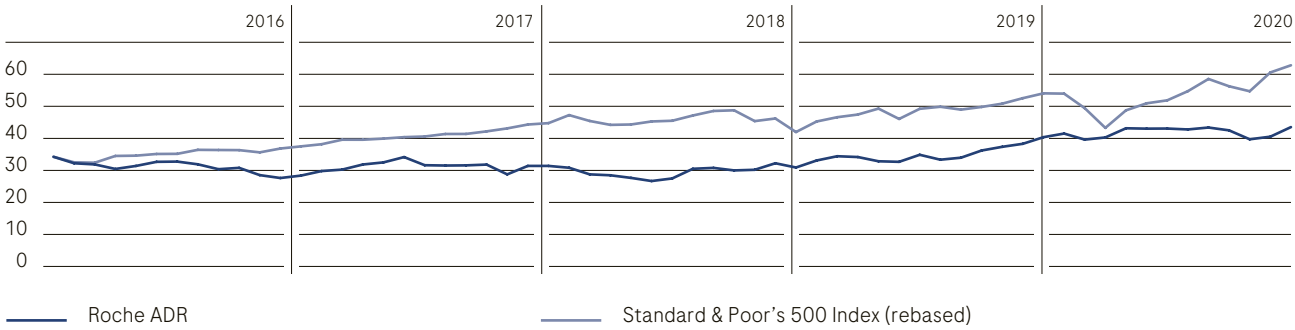
Price development of share in CHF



Price development of non-voting equity security *(Genussschein)* in CHF



Price development of American Depositary Receipt (ADR) in USD



Eight Roche American Depositary Receipts (ADRs) are equivalent to one non-voting equity security *(Genussschein)*. ADRs have been traded in the US over-the-counter market since July 1992.

Number of shares and non-voting equity securities[a)]

	2016	2017	2018	2019	2020
Number of shares (nominal value: CHF 1.00)	160,000,000	160,000,000	160,000,000	160,000,000	160,000,000
Number of non-voting equity securities *(Genussscheine)* (no nominal value)	702,562,700	702,562,700	702,562,700	702,562,700	702,562,700
Total	**862,562,700**	**862,562,700**	**862,562,700**	**862,562,700**	**862,562,700**
Number of own shares and non-voting equity securities *(Genussscheine)* held	(10,635,070)	(8,712,977)	(8,134,699)	(6,806,245)	(9,436,750)
Total in issue	**851,927,630**	**853,849,723**	**854,428,001**	**855,756,455**	**853,125,950**

Data per share and non-voting equity security in CHF

		2016	2017	2018	2019	2020
Earnings (basic)		11.24	10.12	12.29	15.77	16.73
Earnings (diluted)		11.13	10.04	12.21	15.62	16.52
Core earnings (basic)		14.68	15.47	18.25	20.35	19.40
Core earnings (diluted)		14.53	15.34	18.14	20.16	19.16
Equity attributable to Roche shareholders		28.07	30.97	32.33	38.27	42.60
Dividend		8.20	8.30	8.70	9.00	9.10[c)]
Stock price of share[b)]	Opening	276.75	238.00	246.20	239.40	307.60
	High	276.75	271.75	258.00	312.20	352.20
	Low	223.50	230.40	211.60	239.40	267.40
	Year-end	238.00	246.20	239.40	307.60	310.00
Stock price of non-voting equity security *(Genussschein)*[b)]	Opening	276.40	232.60	246.50	243.40	314.00
	High	276.40	272.60	259.50	317.25	354.05
	Low	220.10	227.70	207.70	243.40	274.45
	Year-end	232.60	246.50	243.40	314.00	309.00

Market capitalisation in millions of CHF

	2016	2017	2018	2019	2020
Year-end	199,022	210,426	207,328	267,684	263,776

Key ratios (year-end)

	2016	2017	2018	2019	2020
Dividend yield of shares in %	3.4	3.4	3.6	2.9	2.9
Dividend yield of non-voting equity securities *(Genussscheine)* in %	3.5	3.4	3.6	2.9	2.9
Price/earnings of shares	21	25	20	20	19
Price/earnings of non-voting equity securities *(Genussscheine)*	21	25	20	20	19

a) Each non-voting equity security *(Genussschein)* confers the same rights as any of the shares to participate in the available earnings and any remaining proceeds from liquidation following repayment of the nominal value of the shares and the participation certificate capital (if any). Shares and non-voting equity securities are listed on the SIX Swiss Exchange. Roche Holding Ltd has no restrictions as to ownership of its shares or non-voting equity securities.
b) All stock price data reflect daily closing prices.
c) 2020 dividend proposed by the Board of Directors.

Stock codes

	Share	Non-voting equity security	American Depositary Receipt (ADR)
SIX Swiss Exchange	RO	ROG	–
Bloomberg	RO SW	ROG VX	RHHBY US
Reuters	RO.S	ROG.VX	RHHBY.PK

Roche Holding Ltd, Basel

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Financial Statements

Balance sheet in millions of CHF

	31 December 2020	31 December 2019
Current assets		
Cash and cash equivalents	1,287	1,455
Marketable securities	1,700	1,585
Accounts receivable from Group companies	4,079	4,427
Short-term loans to Group companies	3,000	1,500
Total current assets	**10,066**	**8,967**
Non-current assets		
Long-term loans to Group companies	525	604
Investments	8,869	8,869
Total non-current assets	**9,394**	**9,473**
Total assets	**19,460**	**18,440**
Short-term liabilities		
Accounts payable to Group companies	6	3
Interest-bearing liabilities to Group companies	1,716	870
Other short-term liabilities	77	15
Total short-term liabilities	**1,799**	**888**
Long-term liabilities		
Provisions	35	35
Total long-term liabilities	**35**	**35**
Total liabilities	**1,834**	**923**
Shareholders' equity		
Share capital	160	160
Non-voting equity securities *(Genussscheine)*	p.m.	p.m.
Legal retained earnings:		
– General legal retained earnings	300	300
Voluntary reserves and retained earnings:		
– Free reserve	6,000	6,000
– Special reserve	2,152	2,152
– Available earnings		
– Balance brought forward from previous year	1,142	1,068
– Net income for the year	7,872	7,837
Total shareholders' equity	**17,626**	**17,517**
Total shareholders' equity and liabilities	**19,460**	**18,440**

p.m. = pro memoria. Non-voting equity securities *(Genussscheine)* have no nominal value.

Income statement in millions of CHF

	Year ended 31 December 2020	2019
Income		
Income from investments (dividend income)	7,978	7,814
Other financial income		
– Interest income from loans to Group companies	32	32
– Income from marketable securities and other	6	3
Guarantee fee income from Group companies	58	69
Other income	2	32
Total income	**8,076**	**7,950**
Expenses		
Administration expenses	(35)	(35)
Other expenses	(67)	(39)
Financial expenses	(96)	(30)
Direct taxes	(6)	(9)
Total expenses	**(204)**	**(113)**
Net income	**7,872**	**7,837**

Notes to the Financial Statements

1. Summary of significant accounting policies

Basis of preparation

The financial statements of Roche Holding Ltd, Basel (the 'Company') have been prepared in accordance with the provisions of Swiss Law on Accounting and Financial Reporting (32nd title of the Swiss Code of Obligations, 'CO'). Where not prescribed by law, the significant accounting principles applied are described below.

The Company has prepared its consolidated financial statements in accordance with a recognised accounting standard (International Financial Reporting Standards). In accordance with the CO, the Company decided to forgo presenting additional information on audit fees in the notes as well as a cash flow statement.

Valuation methods and translation of foreign currencies

Marketable securities are reported at the lower of cost or market value. All other financial assets, including investments, are reported at cost less appropriate write-downs. Own equity instruments are recognised at cost and deducted from equity at the time of purchase. If the own equity instruments are sold, the gain or loss is recognised through the income statement. Assets and liabilities denominated in foreign currencies are translated into Swiss francs using year-end rates of exchange, except investments which are translated at historical rates. Transactions during the year which are denominated in foreign currencies are translated at the exchange rates effective at the relevant transaction dates. Resulting exchange gains and losses are recognised in the income statement with the exception of unrealised gains which are deferred.

Investments

The direct and indirect investments of the Company are listed in Note 33 to the Roche Group Annual Financial Statements. This listing excludes Chugai's subsidiaries as well as companies that are not material, notably companies that are inactive, dormant or in liquidation. Ownership interests equal voting rights.

Taxes

Direct taxes include corporate income and capital taxes.

2. Shareholders' equity

Share capital

As in the previous year, share capital amounts to CHF 160 million. The share capital consists of 160,000,000 bearer shares with a nominal value of CHF 1.00 each. Included in equity are 702,562,700 non-voting equity securities *(Genussscheine)*. They are not part of the share capital and confer no voting rights. However, each non-voting equity security confers the same rights as any of the shares to participate in the available earnings and in any remaining proceeds from liquidation following repayment of the nominal value of the share capital and, if any, participation certificates.

Own equity instruments

At 31 December 2020 the Company did not hold any Roche shares or non-voting equity securities (2019: none). During 2020 and 2019 the Company neither purchased nor sold Roche shares or non-voting equity securities.

Company subsidiaries that meet the definitions and requirements of Article 659b CO do not hold equity instruments. Within the Roche Group Annual Financial Statements some entities (mainly foundations) are included in the consolidation which do not qualify as subsidiaries under Article 659b CO.

Movement in recognised amounts in millions of CHF

			Voluntary reserves and retained earnings				
	Share capital	Legal retained earnings	Free reserve	Special reserve	Available earnings	Own equity instruments	Total equity
As at 1 January 2018	160	300	6,000	2,152	8,078	0	16,690
Net income	–	–	–	–	7,653	–	7,653
Dividends	–	–	–	–	(7,159)	–	(7,159)
Transactions in own equity instruments	–	–	–	–	–	0	0
As at 31 December 2018	**160**	**300**	**6,000**	**2,152**	**8,572**	**0**	**17,184**
Net income	–	–	–	–	7,837	–	7,837
Dividends	–	–	–	–	(7,504)	–	(7,504)
Transactions in own equity instruments	–	–	–	–	–	0	0
As at 31 December 2019	**160**	**300**	**6,000**	**2,152**	**8,905**	**0**	**17,517**
Net income	–	–	–	–	7,872	–	7,872
Dividends	–	–	–	–	(7,763)	–	(7,763)
Transactions in own equity instruments	–	–	–	–	–	0	0
As at 31 December 2020	**160**	**300**	**6,000**	**2,152**	**9,014**	**0**	**17,626**

3. Contingent liabilities

Guarantees

The Company has issued guarantees for certain bonds and notes, commercial paper notes and credit facilities of Group companies. The nominal amount outstanding at 31 December 2020 was CHF 13.4 billion (2019: CHF 13.9 billion). These are described in Note 21 to the Roche Group Annual Financial Statements.

4. Significant shareholders

All shares in the Company are bearer shares, and for this reason the Company does not keep a register of shareholders. The following figures are based on information from shareholders, the shareholder validation check at the Annual General Meeting of 17 March 2020 and on other information available to the Company.

Controlling shareholders

At 31 December 2020 and 2019, based on information supplied to the Group, a shareholder group with pooled voting rights owned 72,018,000 shares, which represented 45.01% of the issued shares. On 5 December 2019 the shareholder group announced that it would continue the shareholder pooling agreement with a modified shareholder composition. This group consists now of Mr André Hoffmann, Ms Marie-Anne Hoffmann, Ms Vera Michalski, Mr Alexander Hoffmann, Mr Frederic Hoffmann, Ms Isabel Hoffmann, Mr Lucas Hoffmann, Ms Marina Hoffmann, Ms Kasia Barbotin-Larrieu, Ms Tatiana Fabre, Mr Andreas Oeri, Ms Catherine Oeri, Ms Sabine Duschmalé, Mr Jörg Duschmalé, Mr Lukas Duschmalé, the charitable Foundation Wolf and Artuma Holding Ltd. The shareholder pooling agreement has existed since 1948. The duration of the pool was extended for an indefinite period in 2009. The figures above do not include any shares without pooled voting rights that are held outside this group by individual members of the group. Ms Maja Oeri, formerly a member of the pool, holds 8,091,900 shares representing 5.057% of the voting rights independently of the pool.

At 31 December 2020, based on information supplied to the Group, 53,332,863 shares (2019: 53,332,863 shares) are owned by Novartis Holding AG, Basel (participation below 33⅓%).

5. Full-time equivalent employees

The annual average number of full-time equivalent employees for 2020 and 2019 did not exceed ten people.

6. Board and Executive shareholdings

Board of Directors

Directors Mr André Hoffmann and Dr Jörg Duschmalé and certain other members of the founder's families who are closely associated with them belong to a shareholder group with pooled voting rights. Dr Andreas Oeri, previously a member of the Board of Directors, did not stand for re-election at the Annual General Meeting 2020. At the end of 2020 and 2019 this shareholder group held 72,018,000 shares (45.01% of issued shares). Detailed information about this group is given in Note 4. In addition, at the end of the year the members of the Board of Directors and persons closely associated with them held shares and non-voting equity securities *(Genussscheine)* as shown in the table below.

Shareholdings of members of the Board of Directors

	Shares		Non-voting equity securities *(Genussscheine)*		
	2020	2019	2020	2019	Other
C. Franz	23,210	19,771	4,810	4,810	
A. Hoffmann	0[a]	0[a]	200	200	
J. Bell	n/a	1,115	n/a	1,647	
J. Brown	729	729	0	0	
P. Bulcke	0	0	4,000	4,000	
H. Clevers	0	0	750	0	
J. Duschmalé	0[a]	n/a	0	n/a	
P. Frost	1,000	n/a	0	n/a	
A. Hauser	3,000	3,000	150	150	d)
R. P. Lifton	0	0	0	0	e)
A. Oeri	n/a	0[a]	n/a	187,793	
B. Poussot	500	500	500	500	
S. Schwan	–	–	–	–	b)
C. Suessmuth Dyckerhoff	0	0	2,100[c]	2,100[c]	
Total	**28,439**	**25,115**	**12,510**	**201,200**	

a) Does not include shares held in the shareholder group with pooled voting rights.
b) As a member of the Corporate Executive Committee, Dr Schwan's shareholdings are disclosed in the tables below.
c) Jointly held with close relative.
d) Close relatives of A. Hauser held 20 non-voting equity securities *(Genussscheine)* (2019: 20).
e) R. P. Lifton held 300 Roche American Depositary Receipts (ADRs) (2019: 300). Eight ADRs are equivalent to one non-voting equity security *(Genussschein)*. ADRs have been traded in the US over-the-counter market since July 1992.

Corporate Executive Committee

At the end of the year members of the Corporate Executive Committee and persons closely associated with them held shares and non-voting equity securities as shown in the table below.

Shareholdings of members of the Corporate Executive Committee

	Shares		Non-voting equity securities *(Genussscheine)*		Other
	2020	2019	2020	2019	
S. Schwan	196,789	191,595	50,176	35,273	a)
B. Anderson	0	0	4,547	1,986	a)
A. Hippe	6,970	6,970	27,579	20,830	a)
G. A. Keller	n/a	19,441	n/a	27,271	a), b)
T. Schinecker	0	0	737	155	a)
C. A. Wilbur	0	0	8,491	4,315	a)
Total	**203,759**	**218,006**	**91,530**	**89,830**	

a) Equity compensation awards: S-SARs, RSUs and Roche Performance Share Plan.
b) At 31 December 2019 close relatives of Dr Keller held 1,100 Roche shares.

As of 2019 the remuneration from equity compensation plans to members of the Corporate Executive Committee has been complemented with Restricted Stock Units (RSUs) and since then is composed of 80% Stock-settled Stock Appreciation Rights (S-SARs) and 20% RSUs. In 2020 and 2019 no new Performance Share Plan (PSP) awards were granted.

At 31 December 2020 members of the Corporate Executive Committee held Stock-settled Stock Appreciation Rights (S-SARs) as shown in the table below. The terms and vesting conditions of these awards are disclosed in Note 27 to the Roche Group Annual Financial Statements and additional supplementary information is given in the Remuneration Report included in the Annual Report on pages 138 to 165. S-SARs awards granted to members of the Corporate Executive Committee vest after four years (awards granted before 2019 vest after three years).

S-SARs awards held at 31 December 2020

Year of issue	2020	2019	2018	2017	2016	2015	2014	Total
S. Schwan	103,260	122,322	100,677	85,476	89,517	59,997	29,864	591,113
B. Anderson	46,467	55,045	43,929	35,925	0	0	0	181,366
A. Hippe	41,304	48,930	40,275	34,191	0	0	0	164,700
T. Schinecker	20,652	7,744	6,288	1,608	0	0	0	36,292
C. A. Wilbur	25,815	29,052	21,402	16,032	15,339	4,164	5,754	117,558
Total	**237,498**	**263,093**	**212,571**	**173,232**	**104,856**	**64,161**	**35,618**	**1,091,029**
Strike price (CHF)	308.05	271.65	220.80	251.90	251.50	256.10	263.20	
Expiry date	Mar. 2030	Mar. 2029	Mar. 2025	Mar. 2024	Mar. 2023	Mar. 2022	Mar. 2021	

At 31 December 2020 members of the Corporate Executive Committee held Restricted Stock Units (RSUs) as shown in the table below. The terms and vesting conditions of these awards are disclosed in Note 27 to the Roche Group Annual Financial Statements and additional supplementary information is given in the Remuneration Report included in the Annual Report on pages 138 to 165. RSU awards granted to members of the Corporate Executive Committee vest after four years (awards granted before 2019 vest after three years). Thereafter, the non-voting equity securities and/or shares may remain blocked for up to ten years.

RSU awards held at 31 December 2020

Year of issue	2020	2019	2018	Total
S. Schwan	3,463	3,927	–	7,390
B. Anderson	1,558	1,767	5,270	8,595
A. Hippe	1,385	1,571	–	2,956
T. Schinecker	693	745	1,131	2,569
C. A. Wilbur	866	933	–	1,799
Total	**7,965**	**8,943**	**6,401**	**23,309**

At 31 December 2020 members of the Corporate Executive Committee did not hold any Performance Share Plan (PSP) awards. The terms and vesting conditions of the awards of the remaining 2018–2020 cycle are disclosed in Note 27 to the Roche Group Annual Financial Statements and additional supplementary information is given in the Remuneration Report included in the Annual Report on pages 138 to 165. Each award will result in between zero and two non-voting equity securities or shares (before value adjustment), depending upon the achievement of the performance targets and the discretion of the Board of Directors. After vesting, the non-voting equity securities or shares may remain blocked for up to ten years. At the end of the remaining 2018–2020 cycle the performance targets were achieved and accordingly the participants will receive 200% of the originally targeted non-voting equity securities. In 2020 and 2019 no new PSP awards were granted to members of the Corporate Executive Committee.

Information relating to the number and value of rights, options and awards granted to employees of the Roche Group and members of the Board of Directors and the Corporate Executive Committee of the Company are disclosed in Note 27 and Note 32 to the Roche Group Annual Financial Statements.

Appropriation of Available Earnings

Proposals to the Annual General Meeting in CHF

	2020	2019
Available earnings		
Balance brought forward from previous year	1,141,948,483	1,067,627,859
Net profit for the year	7,872,368,794	7,837,384,924
Total available earnings	**9,014,317,277**	**8,905,012,783**
Appropriation of available earnings		
Distribution of an ordinary dividend of CHF 9.10 gross per share and non-voting equity security *(Genussschein)* as against CHF 9.00 last year	(7,849,320,570)	(7,763,064,300)
Total appropriation of available earnings	**(7,849,320,570)**	**(7,763,064,300)**
To be carried forward on this account	**1,164,996,707**	**1,141,948,483**

KPMG

Statutory Auditor's Report

To the General Meeting of Roche Holding Ltd, Basel

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of Roche Holding Ltd, which comprise the balance sheet as at 31 December 2020, the income statement for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion the financial statements (pages 179–187) for the year ended 31 December 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.

Report on Key Audit Matters based on the circular 1/2015 of the Federal Audit Oversight Authority

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the financial statements of the current period. We have determined that there are no key audit matters to communicate in our report.

Responsibility 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 judgement and maintain professional scepticism 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 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 or its relevant 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 or its relevant committee 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, related safeguards.

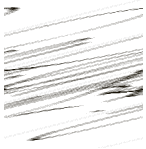
From the matters communicated with the Board of Directors or its relevant committee, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report, unless 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 para. 1 item 3 CO and the 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.

KPMG AG



Mark Baillache
Licensed Audit Expert
Auditor in Charge

Marc Ziegler
Licensed Audit Expert

Basel, 1 February 2021

KPMG AG, Viaduktstrasse 42, PO Box 3456, CH-4002 Basel

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Next Annual General Meeting:
16 March 2021

Cautionary statement regarding forward-looking statements
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The statement regarding earnings per share growth is not a profit forecast and should not be interpreted to mean that Roche's earnings or earnings per share for 2021 or any subsequent period will necessarily match or exceed the historical published earnings or earnings per share of Roche.

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Our reporting consists of the actual Annual Report and of the Finance Report and contains the annual financial statements and the consolidated financial statements. With regards to content, the Management Report as per the Articles of Incorporation consists of both aforementioned reports with the exception of the Remuneration Report.

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