

Emerging arboviruses in the Pacific

Dengue virus is the causal agent of dengue fever and is typically characterised by fever, myalgia, arthralgia, rash, and sometimes severe and life-threatening clinical symptoms. This virus is regarded as the greatest threat to global public health of arthropod-borne viruses (arboviruses). However, during the past decade additional mosquito-borne viruses, including chikungunya virus, which causes fever and acute polyarthralgia, have successfully expanded to geographical areas where only dengue epidemics used to be reported, particularly to the tropical oceanic regions. In 2005, chikungunya virus was recorded in the Indian Ocean islands, and from the end of 2013, reached the Caribbean.¹ In 2014, concomitant outbreaks have happened in the Pacific due to dengue virus, chikungunya virus, and Zika virus—another mosquito-borne virus that mostly causes mild fever, joint pain, conjunctivitis, and rash.^{2–4}

Substantial changes in epidemiology of mosquito-borne diseases in tropical oceanic regions are probably caused by many and difficult to address factors. However, a review of the epidemiological situation in the Pacific from the past several years shows that the present crisis could be the product of a gradual process. In the Pacific the situation worsened during a 7-year period; the predominant circulation of a single dengue virus serotype (dengue virus serotype [DENV]-1) changed to co-circulation of several virus serotypes (DENV-4 in 2007, then also with DENV-2, which caused some sporadic outbreaks, and co-circulation of DENV-3 in 2013),² and concurrent emergence of mosquito-borne viruses not previously reported in the region (figure).

In 2007, the Yap State, the Federated States of Micronesia reported the first outbreak of Zika virus outside of Africa and Asia.⁵ Subsequent

infections of Zika virus in other Pacific islands were not reported until 2013, when this virus reappeared in French Polynesia and then disseminated throughout the Pacific.⁴ The first autochthonous chikungunya infections in the region were reported in 2011 in New Caledonia. Chikungunya

outbreaks occurred in Papua New Guinea in 2012, the Yap State in 2013, and Tonga, American Samoa, Samoa, and Tokelau in 2014.

Tropical oceanic regions host potential vectors for many arboviruses that local populations are mostly naive for, making these regions an

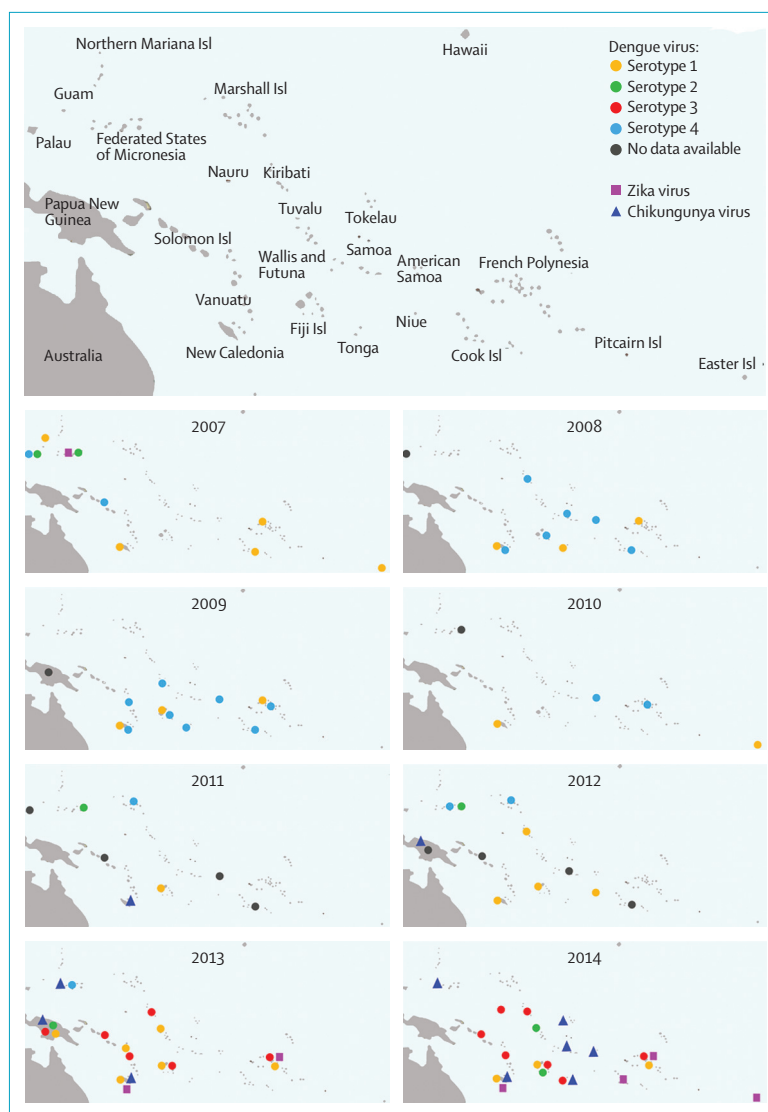


Figure: Expansion of dengue, chikungunya, and Zika viruses in Pacific Island countries and territories between 2007 and 2014

Isl=Island. Plot marks represent the occurrence of an outbreak. Imported cases from the Pacific with mosquito-borne viral infection confirmed back to their home country were not reported if additional information on the possible occurrence of an outbreak in the Island Country visited was not available. Data (up to September, 2014) are from ProMED (<http://www.promedmail.org>), WHO western Pacific Region (<http://www.wpro.who.int/southpacific/>), Pacific Public Health Surveillance Network (<http://www.spc.int/phs/PPHSN>; <http://www.spc.int/phd/epidemics/>), Ministry of Health of New Zealand (www.health.govt.nz), Direction des Affaires Sanitaires et Sociales New Caledonia (<http://www.dass.gouv.nc/portal/page/portal/dass/>), Direction of Health French Polynesia (<http://www.hygiene-publique.gov.pf/spip.php?article120>), or from reports by the Pacific Islands health authorities on the results of molecular tests done at Institut Louis Malardé, French Polynesia, as part of the outbreaks investigations supported by WHO.

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ideal setting for such emerging viruses to spread; thus greatly contributing to the globalisation of dengue, chikungunya, and Zika viruses as threats to public health.

We declare no competing interests.

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- 1 Leparc-Goffart I, Nougaiere A, Cassadou S, Prat C, de Lamballerie X. Chikungunya in the Americas. *Lancet* 2014; **383**: 514.
- 2 Cao-Lormeau VM, Roche C, Musso D, et al. Dengue virus type 3, South Pacific Islands, 2013. *Emerg Infect Dis* 2014; **20**: 1034–36.
- 3 Roth A, Hoy D, Horwood PF, et al. Preparedness for threat of Chikungunya in the Pacific. *Emerg Infect Dis* 2014; **20**: e130696.
- 4 Musso D, Nilles EJ, Cao-Lormeau VM. Rapid spread of emerging Zika virus in the Pacific area. *Clin Microbiol Infect* 2014; published online June 7. DOI:10.1111/1469-0691.12707.
- 5 Duffy MR, Chen TH, Hancock WT, et al. Zika outbreak on Yap Island, Federated States of Micronesia. *N Engl J Med* 2009; **360**: 2536–43.

Continued child survival gains will require societal change

If a child born today has half the risk of dying than if born in 1990, as stated in Joy Lawn's Comment (Sept 13, p 931),¹ this is indeed a remarkable achievement. The substantial drop, notwithstanding the fact that in some countries gains are being carried by wealthier quintiles,² has been ascribed to maternal education, improved environment, health-care technologies, and better transport and communication.^{1,3} Unfortunately, other than the mention of "human capital" on two occasions, the analysis by Lawn¹ is restricted by a predominant biomedical focus and the absence of an engagement with what are likely to be the most compelling

issues in the next 15 years—namely inequity and climate change. Reduction of the neonatal mortality rate, for example, from 70 to 30 might be achievable through biomedical interventions, technological changes coupled with health systems change, female education, and nutritional interventions. Decreasing it further however, is going to depend less on these factors and issues of governance than it does on paradigm shifts in global political and economic thinking.

The global system is driven by inequity, by capital outflows from low-income countries that dwarf inflows by more than six to one,⁴ and a global system with increasing numbers of what Klein⁵ calls "sacrifice zones" (poor out of the way places that are being destroyed by the consequences of global warming). Biomedical and health system change will not affect these "sacrifice zones" and as such, are likely to hinder further improvements in child survival in the coming decades. This has particular resonance in view of the imminent release of the Sustainable Development Goals for the post-2015 era. The very phrase "sustainable development" has been criticised as unachievable when development is defined in economic terms (in the context of hyper consumption and depletion of the earth's resources), and there is a need to think about "developing sustainably".⁶ If we link this to the six dimensions of sustainability outlined by Horton⁷ (wellbeing, capability, intergenerational equity, externalities, resilience, and strength of our civilisations) and, more specifically, the last one, we have to then situate ourselves firmly in the realm of the political. Location of future gains in child survival squarely within what has gone before, largely biomedical and for the most part apolitical, runs the risk of simply doing business as usual and masking the real social and societal changes that are needed to achieve ambitious goals.

We declare no competing interests.

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- 1 Lawn JE. The child survival revolution: what next? *Lancet* 2014; **384**: 931–33.
- 2 Barros AJ, Ronsmans C, Axelson H, et al. Equity in maternal, newborn, and child health interventions in Countdown to 2015: a retrospective review of survey data from 54 countries. *Lancet* 2012; **379**: 1225–33.
- 3 Wang H, Liddell CA, Coates MM, et al. Global, regional, and national levels of neonatal, infant, and under-5 mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2014; **384**: 957–79.
- 4 South Centre. Capital flows from South to North: A new dynamic in global economic relations. Geneva: South Centre; 2008.
- 5 Klein N. This changes everything: capitalism vs the climate. New York: Simon & Shuster; 2014.
- 6 Bensimon CM, Benatar SR. Developing sustainability: a new metaphor for progress. *Theor Med Bioeth* 2006; **27**: 59–79.
- 7 Horton R. Offline: Why the Sustainable Development Goals will fail. *Lancet* 2014; **383**: 2196.

The COPSI Trial: additional fidelity testing needed

India has been at the forefront of using non-specialist health personnel for mental health care worldwide for more than three decades.¹ The COPSI trial (April 19, p 1385)² is an important study in terms of its objectives, design, and rigorous methods. However, India has a large resource constraint for psychiatrists with an average national deficit of 77% and a greater scarcity of other types of mental health professionals.³ Three challenges exist for organisation of mental health care in India and other developing countries: accessibility, acceptability, and affordability. Innovative mental health programmes need to address these issues, but the COPSI trial² did not. First, the Indian states chosen in the trial² were ranked in the top 25th percentile for psychiatrists—ie, states had either a surplus or lower than average deficit of psychiatrists.³