**WHO input to the WMO state of the climate report**

**Generic Text on Climate and Health linkages**

Multiple and complex connections between climate and health exist across timescales, and are being observed by health professionals worldwide. The health chapter of the most recent report of the IPCC (2) (ref) – divides these into three main groups: 1) The direct impacts on human health, such as those which arise from damages and illness from exposure to increased frequency and severity of extreme weather events; 2) Impacts mediated through other environmental systems. These include rising air pollution, and changing patterns of vector-, food- and water-borne diseases; 3) Socially mediated effects, which occur via climate change’s interaction with social and human systems, such as health effects resulting from undernutrition, occupational heat stress and mental illness, as well as potential increases in population displacement and risks of violent conflict, and slowing of economic growth and poverty reduction. Some impacts of climate may be positive, such as decreased local disease transmission or increased agriculture yields, but the overwhelming majority of impacts are negative, occur in already vulnerable populations and represent a collective risk that is deeply concerning to the global health community. Table X summarizes some of the most important expected impacts of climate change by the middle of the current century.1



Table X Summary of the main expected health impacts of climate variability and climate change globally by the middle of the current century Source: WHO

**Part 2 - 2017 Observations**

In 2017, the WHO observed numerous health risks and impacts consistent with the known sensitivity and trends of how climate change influences health, including: increasing exposures to heat stress, the accelerated transmission of vector-borne diseases; disease outbreaks related to flooding; and extended and delayed onset of El Nino related impacts; wildfire related injuries and respiratory problems.

**Heatwaves**

Recent research shows that the overall risk of heat-related illness or death has climbed steadily since 1980, with around 30% of the world’s population now living in climatic conditions that deliver deadly temperatures at least 20 days a year.2 Between 2000 and 2016, the number of vulnerable people exposed to heatwave events has increased by approximately 125 million, with a record 175 million more people exposed to heatwaves in 2015”.3 The heat waves during summer 2016-2017 contributed to the two hottest years on record, with temperatures well over 40°C in many parts of Europe during June 2017.4 In the coming decades, extreme heat will have an ever-greater impact on wellbeing and productivity.

**ENSO**

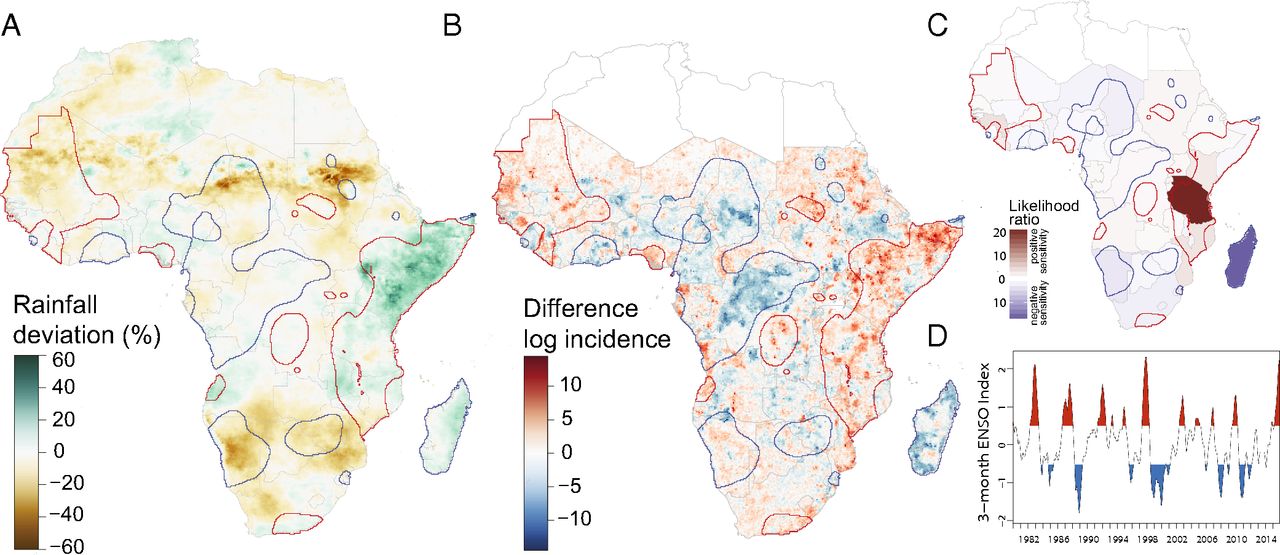
The 2015/16 El Niño episode caused drought, flooding and severe storms, prompting 23 countries to seek humanitarian assistance for over 60 million people. While the El Niño episode ended in May 2016, East and Southern Africa the health impacts of this event have delayed onset and long duration, with related impacts continuing to be observed throughout 2017 in vulnerable populations in parts of Eastern and Southern Africa, Asia and the Pacific, the Dry Corridor in Central America, and Haiti in the Caribbean. This event will also cause long term consequences for public health, interlinked with conditions of nutrition, livelihoods, water and sanitation.

**Vector-borne diseases: Zika in the Americas**

Vector-borne diseases are highly climate sensitive and favourable climate conditions can trigger and amplify disease transmission. This is thought to be the case with the emergence of the Zika virus (ZIKV) carried by the *aedes* mosquito in Latin America and the Caribbean in 2014-2016 which occurred during a period of severe drought and unusually high temperatures, associated with the 2015-2016 El Niño event.5 The initial Brazilian outbreak appears to have been aided by a drought driven by El Niño, and by higher temperatures. With studies identifying a “striking overlap” between areas in Brazil that were afflicted by extreme weather conditions, and areas where Zika virus cases emerged one month later.6 Currently in 2017, local transmission and the associated and resulting foetal malformations and neurological disorders continue to be monitored and recorded in the region, and worldwide.

**Water-borne diseases: Cholera in Africa**

Cholera remains a significant public health problem in many parts of the world. In 2016, 38 countries reported a total of 132 121 cases including 2420 deaths. In cholera-endemic countries, an estimated 1.3 billion people are at risk, while in Africa alone, about 40 million people live in cholera hotspots.7 These cholera “hotspots” have been identified across most endemic countries facing recurrent and predictable cholera outbreaks, often coinciding with the rainy season. The WHO has recognized that large cholera outbreaks in East and Central, and later Southern Africa were likely aided by El Nino driven weather conditions that accelerated transmission across the region starting in mid-2015, with control efforts still underway in several countries in 2017.8 A 2017 study, has observed that the annual geographic distribution of cholera in Africa from 2000 to 2014 changes dramatically in relation to ENSO states, with the burden shifting to continental East Africa where increased rainfall is experienced and almost 50,000 additional cases occur during El Niño years - and away from Madagascar and portions of southern, Central, and West Africa.9 However, the study also observed cholera incidence was also higher in some areas with decreased rainfall, suggesting a complex relationship between rainfall and cholera incidence exists, and is likely mediated by local water and sanitation conditions and health care access.

 <http://www.pnas.org/content/114/17/4436/F1.expansion.html>

**Outbreaks, Injury, Death, and mental impacts of and flooding**

The worst floods in a century have affected Bangladesh, India, Pakistan, and Nepal affecting more than 41 million people. The risk of communicable diseases, particularly fecal oral diseases, also increases in flooded areas.10 In Bangladesh alone, more than 13,000 cases of waterborne diseases and respiratory infections have been reported during 3 weeks in August.11 1200 deaths have been reported during the flooding and landslides in Bangladesh, India, and Nepal during 2017.12

In Nepal following heavy rainfall in August 2017 public health facilities reportedly affected include: 39 public hospitals, 109 primary health care centres and 1,554 health posts. 10 fully damaged and 64 partially damaged, while others reported inundation and disruption to health services several days.13

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**References**

1 World Health Organization. Climate and Health Country Profiles 2015. 2015.

2 Mora C, Dousset B, Caldwell IR, *et al.* Global risk of deadly heat. *Nat Clim Chang* 2017. DOI:10.1038/nclimate3322.

3 Watts N, Markus A, Ayeb-Karlsoon S, *et al.* The 2017 Report of The Lancet Countdown on Health and Climate Change: From 25 years of inaction to a global transformation for public health. *Lancet* 2017.

4 World Meteorological Organization. High temperatures and extreme weather continue. 2017. https://public.wmo.int/en/media/news/high-temperatures-and-extreme-weather-continue.

5 Muñoz ÁG, Thomson MC, Goddard L, Aldighieri S. Analyzing climate variations at multiple timescales can guide Zika virus response measures. *Gigascience* 2016; **5**: 41.

6 Paz S, Semenza JC. El Niño and climate change - Contributing factors in the dispersal of Zika virus in the Americas? *Lancet* 2016; **387**: 745.

7 World Health Organization. Weekly epidemiological record. 2017. http://apps.who.int/iris/bitstream/10665/255611/1/WER9222.pdf?ua=1.

8 World Health Organization. Cholera: the genie that escaped. Emergencies Prep. response. 2017. http://www.who.int/csr/disease/epidemic-focus/cholera/en/.

9 Moore SM, Azman AS, Zaitchik BF, *et al.* El Niño and the shifting geography of cholera in Africa. *Proc Natl Acad Sci* 2017; **114**: 4436–41.

10 Ahern M, Kovats RS, Wilkinson P, Few R, Matthies F. Global health impacts of floods: Epidemiologic evidence. *Epidemiol Rev* 2005; **27**: 36–46.

11 International Federation of Red Cross and Red Crescent Societies. South Asia flood crisis: Disease outbreaks, funding shortages compound suffering of flood survivors. South Asia flood Cris. Dis. outbreaks, funding shortages Compd. Suff. flood Surviv. 2017. https://media.ifrc.org/ifrc/press-release/south-asia-flood-crisis-disease-outbreaks-funding-shortages-compound-suffering-flood-survivors/.

12 World Meteorological Organization. Rainfall extremes cause widespread socio-economic impacts. 2017. https://public.wmo.int/en/media/news/rainfall-extremes-cause-widespread-socio-economic-impacts.

13 World Health Organization. Situation Report #5, Nepal Flood 2017. 2017. https://reliefweb.int/sites/reliefweb.int/files/resources/who\_sitrep-06sept2017.pdf.