El Niño and climate change—contributing factors in the dispersal of Zika virus in the Americas?

In their letter, Isaac I Bogoch and colleagues (Jan 23, p 335)[1] anticipated the international spread of Zika virus from Brazil through air traffic. Permissive climatic conditions for *Aedes* mosquitoes might have contributed to the explosive spread of Zika virus in Brazil. In fact, the 2015 El Niño caused exceptional climatic conditions in northeastern South America during winter and spring in the southern hemisphere. According to the US National Oceanic and Atmospheric Administration,[2] the temperatures over north and eastern South America were "record warmest", accompanied by a severe drought, throughout the second half of 2015. These extreme conditions might also be a manifestation of climate change that have contributed to the rapid dispersal of the Zika virus.

A striking overlap emerges when regions with extreme climatic conditions in one month are juxtaposed to the geographic distribution of Zika virus in the subsequent month (appendix).[3–5] Temperature is known to have a role in adult vector survival, viral replication, and infective periods. Elevated temperatures (within a temperature envelope) can expand the geographic vector range, decrease the extrinsic incubation period of the pathogen, and increase the female mosquito biting rate.[6] Although precipitation provides essential habitat for larvae during the aquatic stages of the *Aedes* lifecycle, drought can indirectly expand the vector's range. In several locations (including northeastern Brazil), the risk of range expansion of *Aedes aegypti* is correlated with an increase in water storage in household containers during a persistent regional drought.[7] Thus, the unique climatic conditions created during this severe El Niño event should be considered contributing factors in the dispersal of Zika virus in the Americas and should also be considered as the virus continues to spread.

We declare no competing interests.

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5 European Center for Disease Prevention and Control (ECDC). Epidemiological update: Outbreaks of Zika virus and complications potentially linked to the Zika virus infection. Figure 1. States with laboratory-confirmed cases Zika virus disease, Brazil, 2015, as of 23 November 2015. Last update: 18 Dec 2015. http://ecdc.europa.eu/en/press/news/_layouts/forms/News_DispForm.aspx?ID=1342&List=8db7286c-fe2d-476c-9133-18ff4cb1b568&Source=http%3A%2F%2Fecdc%2Eeuropa%2Eeu%2Fen%2Fhealthtopics%2Fzika_virus_infection%2Fpages%2Findex%2Easpx (accessed Jan 31, 2016).
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Do not forget the orphan children of Syria

As Syria's humanitarian plight begins its sixth year in March, 2016, nearly 1 million children have been estimated to have become orphans after losing their parents.[1] Many orphan children are living in Syria, but many more children have fled the country, and are psychologically affected by their situation in addition to other injuries they might have. To make matters worse, many orphan children in the bordering refugee countries have been sent out to work, mostly in unsafe types of child labour, to help in surviving.[2]

The orphan children of Syria are at high risk of developing mental health disorders due to traumatic experiences, adjustment difficulties, and loss.[3] Findings of epidemiological studies suggest that displaced and war-affected populations have high rates of mental disorders, especially post-traumatic stress disorder and major depressive disorder.[4] Psychiatric morbidity does not simply resolve with relocation to a stable living environment.[4] In view of these serious considerations, mental health interventions on all levels are necessary to reduce the morbidity and mortality associated with mental illness in this special, high-risk population.

The Inter-Agency Standing Committee Guidelines on Mental Health and Psychosocial Support in Emergency Settings[5] is an excellent resource that helps guide humanitarian actors in addressing the mental health needs during a humanitarian crisis. This approach includes the provision of basic services, security, family or community support, and both non-specialised and specialised mental health services. The cooperation of international agencies, medical relief associations, and humanitarian organisations will be necessary. Many of the agencies working in the region already have existing mental health programmes, so the development of an inter-agency mental health committee is a practical, vital step to address the mental health needs of orphan children and other high-risk populations. The first step of such a committee would be to complete needs assessments and determine the


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