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Experts warn of a surge in vector-borne diseases as humanitarian crisis in Venezuela worsens

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The ongoing humanitarian crisis in Venezuela is accelerating the re-emergence of vector-borne diseases such as malaria, Chagas disease, dengue, and Zika virus, and threatens to jeopardise public health gains in the country over the past two decades, warn leading public health experts. The conclusion comes from a Review paper that provides the most comprehensive assessment of the impact of the crisis in Venezuela, published in *The Lancet Infectious Diseases* journal.

With the collapse of the health care system and the dramatic decline in public health programmes and disease surveillance, vector-borne diseases (which are transmitted by insects such as mosquitoes and ticks) are on the rise and have spread into new territories across Venezuela—once a regional leader in public health and vector control, and the first WHO-certified country to eradicate malaria in 1961.

This is the first time so much information has been brought together to assess the impact of Venezuela's health crisis on vector-borne diseases. However, the authors caution that given the lack of disease surveillance and public health infrastructure available for diagnosis, the true burden of disease remains unknown.

Worryingly, the authors say that this might be just the tip of the iceberg. "As well as the return of measles and other vaccine-preventable infectious diseases, the continued upsurge in malaria could soon become

uncontrollable. The stark reality is that in the absence of surveillance, diagnostic, and preventive measures, these figures most likely represent an underestimate of the true situation", says Dr. Martin Llewellyn from the University of Glasgow, UK, who led the research with Venezuelan, Colombian, Brazilian, and Ecuadorian colleagues.

Analysis of published and unpublished data (see panel) indicate that between 2010 (29,736 cases) and 2015 (136,402 cases), Venezuela experienced an estimated 359% increase in malaria cases, followed by a 71% increase between 2016 (240,613 cases) and 2017 (411,586 cases) because of a decline in mosquito-control activities and shortages in medication. This is potentially the largest malaria increase reported worldwide. Worse still, say the authors, endemic malaria transmission is beginning to spread across the whole country (figure 1).

Findings from the review suggest that the ongoing crisis has also had dramatic effects on other vector-borne diseases. For example, Chagas disease, one of the leading causes of heart failure in Latin America, may be resurging, with active Chagas disease transmission the highest seen in 20 years. Based on samples collected between 2008 and 2018 seroprevalence among children younger than 10 years was estimated at 12.5% in some communities, compared to an all-time low of 0.5% in 1998 (figure 3).

The incidence of dengue has risen more than five-fold, with an average incidence of 211 cases per 100,000 people between 2010 and 2016, and six increasingly large epidemics recorded nationally between 2007 and 2016, compared with four in the previous 16 years (figure 5).

Similarly, the frequency of chikungunya and Zika outbreaks with epidemic potential appear to be increasing, with an estimated 2 million suspected chikungunya cases in 2014 (incidence 6,975 per 100,000)—more than 12 times higher than official national estimates.

The findings also sit in the context of mass emigration. With an average of 5,500 people leaving the country every day in 2018, neighbouring countries are also facing major challenges. For instance, regions of Brazil neighbouring Venezuela have reported an escalating trend in malaria cases (eg. Roraima saw the number of imported cases of malaria rise from 1,538 cases in 2014 to 3,129 in 2017 (figure 2)), but rates in other neighbouring countries remain unclear. The authors highlight that many solutions are possible, even with limited resources. For example, in recent years, malaria has been successfully controlled on the Ecuador-Peru border through bi-national collaboration that involved strengthening surveillance and treatment strategies, and sharing of resources (eg, information, personnel, medication, and insecticides).

Reaching and testing those at risk of infection across Venezuela is a major challenge, say the authors, so it is especially important that communities most at-risk from disease are made aware of the growing threat. Additionally, more needs to be done to improve surveillance and data sharing. The authors point out that surveillance is crucial and must be used to raise awareness among Venezuelan and regional authorities, and encourage them to recognise the growing crisis, cooperate, and accept international medical interventions. Relevant international health authorities must also take action to maintain accurate disease surveillance and response systems in the region.

Successful control of the emerging health crisis will require regional coordination and powerful national and international political commitment, and the authors urge regional health-care authorities to recognise and act on a public health emergency of hemispheric concern.

"We call on the members of the Organization of American States and other international political bodies to apply more pressure to the Venezuelan government to accept the humanitarian assistance offered by the international community in order to strengthen the buckling health

system. Without such efforts, the public health gains achieved over the past 18 years could soon be reversed", warns Llewellyn.

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