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In the eye of the storm: Infectious disease challenges for border countries receiving Venezuelan migrants

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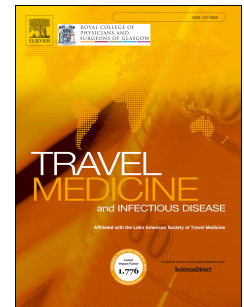
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Editorial**In the Eye of the Storm: Infectious Disease Challenges for Border Countries
Receiving Venezuelan Migrants**

Keywords: malaria; measles; diphtheria; pertussis; arboviruses; travelers; vaccination; Venezuela; Colombia; Brazil; Latin America

No one could have ever imagined that such a resource-rich country like Venezuela could fall in such a short time frame into one of the most complex humanitarian crisis ever witnessed in the western hemisphere [1, 2]. The unexpected and rapid progress of a combined social, economic and political turmoil has driven one of the wealthiest economies of South America into a humanitarian mayhem, ruled by an unprecedented healthcare crisis and the largest forced exodus ever recorded in Latin American history [3, 4].

As has been extensively reported over the last months, the growing flow of migrants and refugees continues to increase on a daily basis, with an estimated four million displaced Venezuelans over the past two years. In particular, 2019 has observed a more rapid increase in fleeing migrants, posing a significant challenge for bordering countries, such as Colombia [5-7], Brazil [8], as well as Guyana and other South American and Caribbean nations [9, 10], for which accurate demographic records still remain largely unavailable. As the surge of Venezuelan migrants continues, so does the risk of spillover not only of infectious diseases, but also of non-communicable diseases

[1] and the financial burden inflicted to neighboring countries and their economies throughout the region.

As proposed by several international non-government organizations (NGO), there is an urgent and unmet need to complete the implementation of a plan to define priorities and set up a regional response strategy, as recently suggested by the Regional Refugee and Migrant Response Plan for Refugees and Migrants from Venezuela, from the Office of the United Nations High Commissioner for Refugees (UNHCR) and the International Organization for Migration (IOM) [11]. This initiative has clearly identified and outlined four areas of intervention: direct emergency assistance, legal and personal protection, socio-economic and cultural integration, and strengthening the capacity of host governments [11].

Regarding the direct emergency assistance area, overall healthcare issues, food security and nutrition, as well as emergency shelters and refugee facilities are topics of main concern. Current migrant populations from Venezuela lack appropriate healthcare conditions with severe limitations in accessing medical assistance and essential drugs to treat chronic conditions. This situation places Venezuelan refugees at greater risk of suffering systemic complications or developing more serious medical conditions when arriving to host countries [11]. In addition, the lack of, and the need for, free access to reproductive health, family planning, and mental health services are important areas to consider. Many migrants are pregnant and lactating women who are running away due to limited or no access to nutritional supplements [12], as well as to standard quality pre- and post-natal care. Also, children and adolescents, are particularly vulnerable of being forcibly recruited by paramilitary armed groups or other criminal elements near

the border or along the route [1, 11] favoring the ongoing epidemic of violence that has swept across border regions of Colombia and Venezuela.

Addressing the logistical and economic challenges associated with all the above mentioned issues is a complex task [13], but at the same time should be a priority in the agenda of all neighboring countries governments, particularly Colombia and Brazil, who currently receive the largest share of Venezuelan migrants. The implementation of such response programs may lead to costs that have been estimated close to the amount of US\$ 737,611,378 [11]. To date, agencies such as USAID have already announced (April 10, 2019) the release of humanitarian funding to mitigate the Venezuela migration crisis and its impact in Latin America. However, and despite the approval of US\$ \$213,304,315 [14], there is still a massive funding gap that remains to be filled. Fears are that as time goes by and the crisis deepens, more resources will be required, and the financial gap will broaden.

As already mentioned, border areas are particularly susceptible to spillover and amplification of ongoing epidemics. The Venezuelan exodus has been an example of such phenomena, in a similar fashion to what has happened recently in other conflict-hit areas of the world such as Syria [15]. Today, as has been extensively reported, the Venezuelan border is a hot spot for the increase, transmission and reemergence of multiple infectious diseases, especially vaccine-preventable diseases [3, 16], vector-borne diseases [2-4, 7, 17-19], zoonoses [20-22], sexually transmitted infections [2, 5, 6], respiratory tract infections, water-borne and food-borne diseases (FBD) [1], which have exhibited a consistent ever increasing trend [3].

In the case of Colombia, dengue, mumps, acute flaccid paralysis, FBD, HIV/AIDS, leishmaniasis, tuberculosis, pertussis, varicella and even bacterial meningitis are clearly on the rise in bordering states such as Norte de Santander [1]. Particularly in these areas, the risk for setting epidemics with its significant morbidity and mortality toll is a significant cause of concern. An important question with no foreseeable answer at the moment is whether such epidemics will remain confined to the refugee population or will continue to spill over onto other local resident populations. This highlights the need for enhanced surveillance, strategies for improved prevention and control, disposing of accurate disease case definition as well as field sampling and laboratory tests for prompt diagnosis, as well as early individual and collective interventions, including education, drugs, quarantine and vaccines, among others [11]. Although the World Health Organization (WHO), has acknowledged the usefulness of a robust worldwide surveillance system for infectious diseases, an optimal and well establishment geo-referenced dataset is still required in Venezuela in order to reach a better understanding of the epidemiological landscape of infectious diseases in the country, and the possible consequences linked to massive migration [23].

The Venezuelan crisis is unique and should be addressed in its appropriate context. Despite its similarities, by no means should the Venezuelan context be compared to other comparable scenarios like those ongoing in the Middle East and Europe. For example, there is a clear difference, between Syrian migrants to European countries [15], where the risk of malaria or arbovirus autochthonous transmission is very low or even null. On the contrary, tropical countries such as Brazil and Colombia are still endemic for malaria and arboviral diseases [24], given their socio-economic, geographic and environmental conditions which favor vectorial transmission (*Anopheles* and *Aedes*,

mainly), in fact, the Mayaro virus (MAYV) is emerging as a new threat [22, 25, 26]. In this setting, the arrival of imported cases from Venezuela and the reestablishment of local endemism could severely impact Colombia's administratively fragile public health system [27], posing an additional burden on its budget, and thus, leading to overloaded services and a potential collapse on healthcare across border areas. A similar situation would be seen in northern areas of Brazil, where social and economic conditions are far from optimal [28]. Furthermore 19 cases of measles were registered in Ecuador during 2018, and 11 of the cases were Venezuelans, while in Colombia, 26 confirmed cases of measles have been reported, 17 were imported from Venezuela [1, 2, 8, 16].

A high level of suspicion, but more importantly an accurate knowledge about Venezuela's ongoing syndemics [3] and complex epidemiological scenery is crucial when addressing and diagnosing imported infectious diseases cases in neighboring countries. Border areas with Venezuela, are particularly in the 'Eye of the Storm' for allowing the entry and spread of infectious diseases, and in which weakened surveillance systems along with delayed reporting can lead to a regional crisis. Moreover, the Venezuelan diaspora has extended beyond its immediate neighbors (Brazil, Colombia), establishing migration routes that include Ecuador, Peru, Chile, Argentina, Uruguay, Paraguay, Panama and the Caribbean amongst others, also posing a risk for the spread of disease to these nations [1].

North America and Europe despite their robust public health systems as well as their stringent infection control practices for prevention and cross-border risk contention are also at risk for the introduction of agents with prolonged or insidious incubation periods

[29]. Such is the case of Chagas disease, visceral leishmaniasis and other endemic tropical diseases [1, 4, 16, 20, 30].

Public health and travel medicine practitioners should be aware of this situation and promote research, diagnosis and identification of travel routes and health-status profiling of migrants in order to deliver appropriate individual and collective healthcare and attention policies aimed at mitigating the impact of migration to bordering countries [3, 4, 7, 12]. The international community should advocate for the timely installment of a united front based on cooperation between local and global public health organizations as the most effective tool for curtailing the ongoing risk of spillover to the region and beyond. This storm will have a long-lasting impact on the epidemiology of infectious diseases in countries bordering Venezuela and in South America.

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