

Editorial

The current syndemic in Venezuela: Measles, malaria and more co-infections coupled with a breakdown of social and healthcare infrastructure. *Quo vadis?*



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What is a “syndemic” and how can it be applied to the current situation in Venezuela? Three concepts underlie the notion of a “syndemic”: disease concentration, disease interaction, and large-scale negative social forces that give rise to them [1]. The concept of disease concentration implies that two or more epidemics co-occur in the presence of temporal and geographical factors coupled with harmful social conditions [1]. Unfortunately, during the last five years, there has been no better example of a syndemic, than in Venezuela.

This South American country, once considered the richest and most developed of the region, today represents an epicenter of the resurgence of multiple vaccine-preventable, vector-borne, and zoonotic diseases with numerous ongoing, co-occurring epidemics [2–6]. Most of these epidemics directly and/or indirectly intersect on their social, biological and epidemiological determinants sharing as common ground a country whipped by an unprecedented humanitarian and political crisis that has led to a massive collapse of its healthcare system along with a large-scale impoverishment of its population among other social forces which have contributed to their origin and persistence [7–11].

Among those vaccine-preventable diseases (VPD), mumps, tetanus, diphtheria and measles, should be highlighted (Fig. 1). Persistent interruption of epidemiological surveillance systems, the weakening and breakdown of the national immunization programs, along with long-term shortages and poor availability of vaccines have all contributed to the resurgence of VPDs in Venezuela [6]. A diphtheria outbreak was first reported in July 2016, and as of 21 September 2018, there were an estimated 1217 laboratory-confirmed cases reported in 22 (of 23) states including the Capital District with a cumulative case-fatality rate among confirmed cases of 16.5% [12]. Between 2012 and 2016, 31 cases were reported (Fig. 1) [6]. For measles, the outbreak is ongoing with cases reported in all states and the Capital District. Since the confirmation of the first measles case during epidemiological week (EW) 26 of 2017 and up to EW 35 of 2018, a total of 5332 confirmed measles cases were reported, including 64 deaths; of the total laboratory-confirmed cases, 727 were in 2017 and 4605 were in 2018 (up to

EW 35 of 2018) (Fig. 1) [13]. Between 2012 and 2016, also a total of 290 cases of mumps have been reported from Venezuela (Fig. 1) [6,12–14].

Vector-control activities have significantly dropped or ceased throughout most of the country: the number of people protected by indoor residual spraying declined from > 2.7 million in 2015 to an estimated 30,000 in 2016, thus allowing the resurgence of a number of arboviral and arbo parasitic diseases, such as dengue, chikungunya [3,15], Zika, malaria [7,10,11], leishmaniasis [16], Chagas disease, among others [17]. Malaria had exhibited a stable transmission trend with less than 50,000 cases per year from 1998 to 2011; however, a significant increase approaching close to 319,000 cases in 2017 raised alarming concerns about the growing epidemic in the country (Fig. 1) and its potential spillover to other neighboring countries in the region [7–11]. A recent source, linked to the government, reported figures of 406,289 malaria cases in 2017 [18], with 700,000 new cases and 1,500 deaths expected by the end of 2018. During this year (2018), 10 pregnant women of 690 indigenous women with malaria in the Amazonas state already died. To date, as per the Director of the World Health Organization (WHO) Global Malaria Programme, malaria may be reaching close to half a million cases per year, thus being considered the largest increase reported anywhere in the world to date (WHO). Among the challenges to achieving a malaria free world in the latest World Malaria Report 2017, the WHO is supporting malaria emergency responses to four countries: Nigeria, South Sudan, Yemen and Venezuela, where ongoing humanitarian crises pose serious health risks [18,19]. It is considered that the principal determinants of the malaria situation in Venezuela are due to a consistent decrease in investment in vector control measures, massive migration of populations to illegal mining areas, lack of first-line antimalarial treatment, progressive loss of trained human resources, progressive loss of local equipment and infrastructure, technical and administrative problems that prevent the selection and implementation of cost-effective interventions, and above all, lack of political will [18].

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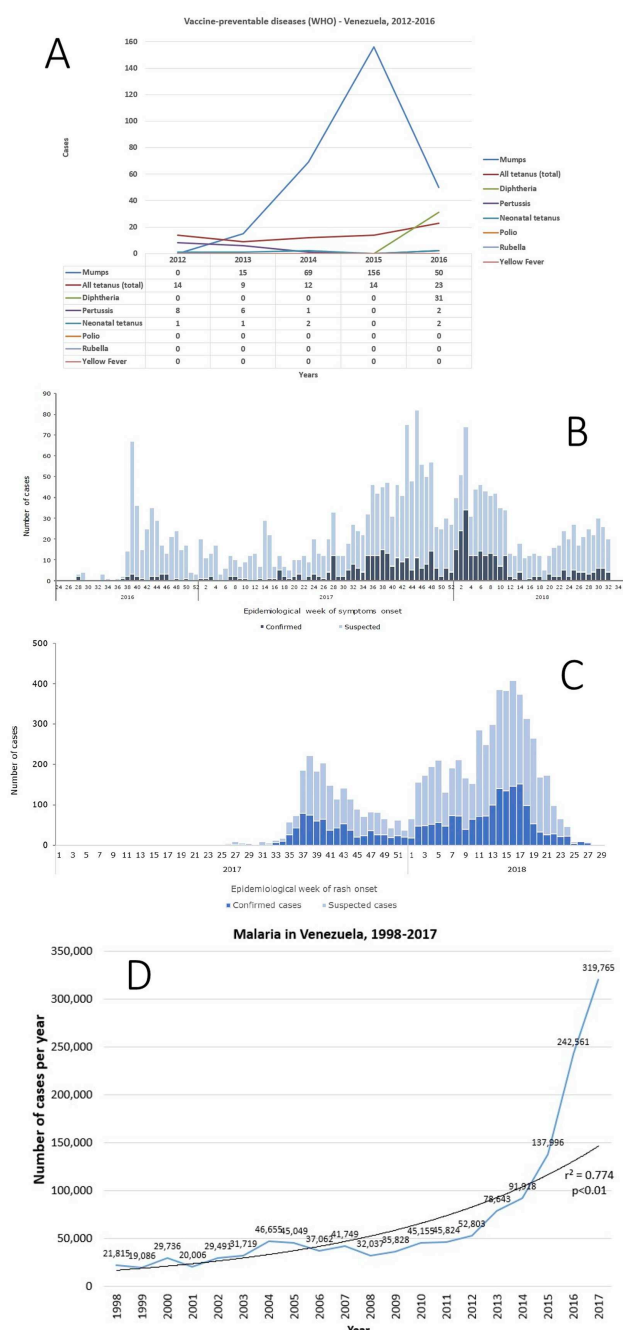


Fig. 1. Epidemiological situation of selected communicable diseases in Venezuela. A. Selected vaccine-preventable diseases, 2012–2016. B. Diphtheria, Venezuela, 2016–2018. C. Measles, Venezuela, 2017–2018. D. Malaria, Venezuela, 1998–2017. Sources: PAHO/WHO [7,12–14].

In addition, the ever-increasing reports of HIV infection (more than 79,000 patients stopped receiving antiretrovirals since 2017), tuberculosis (10,952 new cases in 2017), intestinal parasitic infections [6], even trachoma [27] as well as the latent risk for resurgence of poliomyelitis [14], due to lack of vaccination, are motives of high concern for international public health authorities. The Pan-American Health Organization (PAHO) has called on countries to strengthen and maintain stringent surveillance policies along with high polio vaccination coverage in all communities, in order to minimize the risk and consequences of any eventual reintroduction or reappearance of poliovirus. This is particularly important since the spread of diseases beyond Venezuelan borders has become an imperative challenge for neighboring countries such as Colombia, which have faced a massive influx of Venezuelan refugees with consequent re-introduction of VPDs

and active transmission in bordering vulnerable areas with low vaccination coverage [13].

The ongoing public health and medical crisis is largely a consequence of nearly two decades of erratic political and economic policies dating back to the instalment of the Bolivarian Revolution when the Chavez-Maduro administration took over, dismantling what was once recognized as one of best public health systems in the world [6]. Syndemic's control in Venezuela requires immediate intersectoral action and investment to halt this unnecessary and increasing burden. Operative research, national and international interventions, as well evidence-based policies are urgently required. Today, the region faces a government that has failed to call for an emergency plan during these co-occurring epidemics. After years of persistent syndemic, there is no evidence of a sound commitment to change this situation. What will be

the fate of healthcare in Venezuela? It remains to be seen, but certainly it will not only impact at a national level, but will also pose a threat to regional public health, as well as a risk for travelers from and to this South American country.

Cases of Zika [20], chikungunya [21], leishmaniasis [22], coccidioidomycosis [23], as well as dengue [24], among others, imported from Venezuela, are increasingly being reported, with the possibility of even coinfections [15]. The potential for spillover to other countries even beyond Venezuela's immediate neighbors is exemplified by the explosive dengue epidemic that occurred in Madeira (Portugal) from October 2012 to February 2013, in which phylogeographic analysis confirmed that the most probable origin of the involved strain was from Venezuela. Moreover, recent data has revealed that the circulating measles genotype isolated from imported cases in the region clearly match the measles virus strain isolated from samples of Venezuelan patients [24,25].

According to the recently published evidence-based approach for vaccination in humanitarian crises that incorporates a framework for decision making crafted by WHO, the level of risk for the ongoing Venezuelan outbreaks is “High”. In addition, the Centers for Disease Control and Prevention (CDC) has recently issued a warning-level 3 for non-essential traveling in light of the Health infrastructure breakdown in Venezuela (<https://wwwnc.cdc.gov/travel/notices/warning/health-infrastructure-breakdown-venezuela>). This paramount crisis has no end in sight and travel advisory alerts should be issued and continuously monitored and updated. Travelers should avoid visiting Venezuela considering that the country is experiencing concurrent outbreaks of infectious diseases, and that adequate health care is currently unavailable in most of the country, as well as that foreign governments have a limited ability to provide emergency services and care to their nationals. If compulsory traveling is required, travelers are urged to attend visits with travel medicine practitioners who should assess and provide advice for risk, as well pre-travel and post-travel consultations, including up-to-date vaccination recommendations (taking into account the outbreak situation in Venezuela), malaria prophylaxis and travel health kits including prescription medications (CDC).

Travelers should also be warned that aside from an increasing risk of epidemics [15], Venezuela is also facing a daunting humanitarian crisis with profound shortages of food, water, and electricity, as well as a civil unrest and most importantly and escalating epidemic of violence and crime [26].

Conflicts of interest

None.

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