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Bibliometric assessment of global research on Venezuelan Equine Encephalitis: A latent threat for the Americas

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Dear Editor

As other vector-borne diseases in Latin America and the Caribbean, Venezuelan equine encephalitis (VEE) is a re-emerging infectious disease of concern [1,2]. This affects humans and equines. VEE has been reported in multiple countries of the Americas. The VEE virus (VEEV), is an arbovirus member of the family Togaviridae, genus Alphavirus, which was initially isolated in 1938. Several mosquitoes serve as vectors, including *Culex*, *Aedes* and *Psorophora* species. Therefore, surveillance and control of VEEV infection in humans and equines represents a serious challenge in the region.

Clinical manifestations of the VEEV infection range from headache, fever, arthralgia and retro-ocular pain to fatal encephalitis and hemorrhage, overlapping considerably in signs and symptoms with the dengue fever or other arboviral diseases, such as dengue, chikungunya and Zika, but also other such as Mayaro and Oropouche fever [3–5]. In consequence, cases are commonly misdiagnosed and underreported in resource-limited regions, making it hard to estimate its public health impact and economic burden [5].

More VEE research is needed to achieve a better understanding of the impact of this neglected disease. For that reason, assess the current status of global scientific production on VEE is highly relevant. Therefore, we conducted a bibliometric study using four major biomedical databases: PubMed/Medline (using GoPubMed®), Scopus®, LILACS (Latin America Literature on Health Sciences) and SciELO (Scientific Electronic Library Online). All the papers were included according to the retrieval strategy of "Venezuelan Equine Encephalitis" OR "VEE".

At Medline, 1704 documents were retrieved, with an annual production of 21 ± 17. A total of 46 countries contributed to VEE-related research, led by USA with 33.3% of the articles, followed by France (2.75%), United Kingdom (2.75%), Venezuela (2.23%) and Russia (1.17%) (Fig. 1). At Scopus search 1665 documents were retrieved (49.78% from the USA, 7.62% from Russia and 5.70% from Venezuela), followed by LILACS with 114 articles (65.51% from Venezuela, 12.28% from Colombia and 5.26% from Brazil) and SciELO with 18 documents (10 from Venezuela, 5 from Colombia and 2 from Peru).

Undoubtedly, USA is the highest scientific contributor, as has been reported in previous bibliometric studies on arboviruses. Although outbreaks of VEE in humans and equids have been reported in at least 11 countries of South and Central America, including Venezuela, Bolivia, Colombia, Peru, Ecuador, Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala and Panama, this region contributed only the 5.34% of the global VEE research. Even at the moment (July 2016) there is an ongoing epidemic in the Venezuelan-Colombian north border. In contrast, higher scientific production was observed in European countries (8.92% of the total), notwithstanding cases have not been observed in this continent.

Recent surveillance studies suggest that up to 10% of dengue-like illness in Latin America is caused by VEEV, which can be extrapolated to tens of thousands of cases per year [4], in addition, climate change and deforestation could also affect the distribution of enzootic VEEV by increasing the northward distribution of the tropical mosquito vectors [4].

In conclusion, the low scientific production on VEE, highlights that the burden of this disease is largely unknown, especially in developing countries of the Americas. Thus, the implementation of surveillance programs and effective control measures such as equine vaccination and mosquito control, as well more VEE research, are mandatory to help in prevention of future epidemics.

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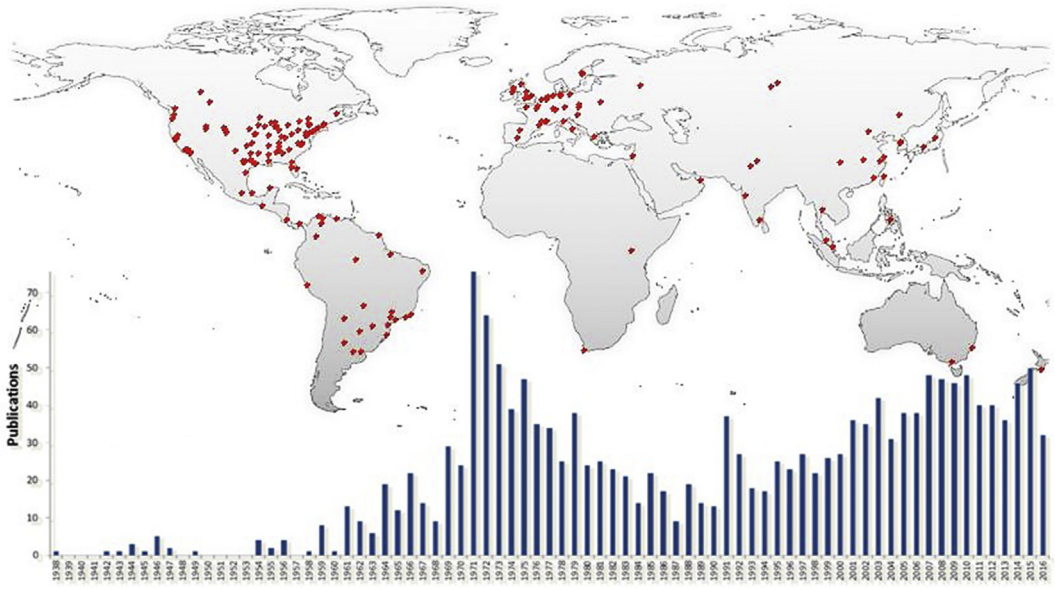

Figure 1 Scientific production on Venezuelan Equine Encephalitis by country, number of publications and trends in time, 1938—2016 (Using GoPubMed).

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Conflict of interest

None of the authors report conflict of interests.

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