Social Determinants of Dengue in Itaboraí, Brazil

Daniel C. P. Camara[1,2,3]; Claudia T. Codeco[2]; Nildimar A. Honorio[1,3]; Jose J. Carvajal[3,4]; Tania Ayllon[3,5]; Luis A. T. Medrano [4]

[1]Laboratório de Mosquitos Transmissores de Hematozoários, IOC/FIOCRUZ, Avenida Brasil 4365, CEP 21040-900, Rio de Janeiro, RJ, Brazil. [2]Programa de Computação Científica, PROCC/FIOCRUZ, Avenida Brasil 4365, CEP 21040-900, Rio de Janeiro, RJ, Brazil. [3]Núcleo Operacional Sentinela de Mosquitos Vetores – NOSMOVE/FIOCRUZ, Avenida Brasil 4365, CEP 21040-900, Rio de Janeiro, RJ, Brazil. [4]Laboratório de Doenças Parasitárias, IOC/FIOCRUZ, Avenida Brasil 4365, CEP 21040-900, Rio de Janeiro, RJ, Brazil. [5]Instituto Nacional de Infectologia, FIOCRUZ, Avenida Brasil 4365, CEP 21040-900, Rio de Janeiro, RJ, Brazil. [6]Departamento de Matemática, ICE/UFRRJ, BR-465, CEP 23.897-000, Seropédica, RJ, Brazil

Dengue is endemic in at least 112 tropical and subtropical countries, with an estimate of 390 million annual cases. In the Americas, cyclic dengue epidemics are associated with uncontrolled urbanization, the invasion and proliferation of *Aedes* vectors and serotypes introduction. Itaboraí is medium-sized city endemic for dengue and with contrasting socioeconomic conditions. Major alterations in the city occurred after a massive influx of people during the installation of Brazil's greatest industrial complex, COMPERJ. The objective of this study is to analyze the dengue pattern and its relationship with socioeconomic indicators in Itaboraí during 2010 to 2012. Socioeconomic indicators were built through PCA using the 2010 Census data. Dengue incidence, the indicators and other socioeconomic variables were modeled in a GLM of the Gaussian family. Moran's global tests were used to find spatial autocorrelation. Our results show that districts with higher incidence were the ones with the higher population and classified as urban. Lower incidence was found in rural and less populated districts. The model was comprised of a household surroundings indicator (HIS) and proportion of literate head of the household variables. Dengue in Itaboraí was strongly linked to urban areas, which often shows better household surroundings conditions but low tree coverage, which may be related to vector biology and ecology. The inverse relation with proportion of literate head of the household shows that investments in education may serve as an empowerment tool for local residents to control breeding sites inside their own houses and neighborhoods. Despite a great influx of investments in Itaboraí, dengue still poses as an endemic disease. The arrival of zika and chikungunya in Brazil and Rio de Janeiro state shows the need of a continuous and strong epidemiologic surveillance, as most of the municipalities in the metropolitan region are permissive to the transmission of these arboviruses.

Palavras-chave: dengue; disease modeling; social determinants.