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Linking surveillance and climate data to combat malaria

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Introduction

Malaria is an infectious disease that affected nearly 215 million individuals in 2015. In Brazil, there are various information systems targeted to store data from disease notification, including malaria surveillance. However, these databases are identified and difficult to be accessed by researchers due to privacy restrictions.

Conclusion/Implications

From the databases we created, it will be possible to implement an indexing structure with related metadata, as well publicize these databases to allow for free access by researchers. Currently, we are also running different predictive analytics methods (including visualisation) targeted to generate a forecast model for malaria epidemics.

Objectives and Approach

Our goal is to integrate data from two different malaria surveillance systems, as well climate, hydrographics and socioeconomic data, to support ecological and cohort-based analyzes on malaria recurrence, parasitic classification assisted by machine learning methods and epidemics forecasting.

Our approach so far was to generate data sets organized by municipality of residence and by municipality of infection and the disposal of these data sets with information aggregated on monthly and annual basis. We expect these databases can be freely used by any researcher intending to conduct studies on malaria using governmental data.

Results

Our current results comprise data sets with information aggregated by municipality of residence, for all municipalities within the Amazonian region (n=772), and by municipalities of infection with active transmission (n=613). For both case, we added variables referring to demographic, socioeconomic, climatological and hydrological data for the period 2010 to 2015 in an annual and monthly form.

We also performed a machine learning-based classification to group notifications according to the type of parasite into *P. vivax*, *P. falciparum* and mixed cases. Our goal is to identify similar and different characteristics among such groups that can be used to correctly assess recurrence, as well support epidemic forecasting.

