

# Dengue surveillance and correlation with rainfall in Paraíba, Northeast Brazil: Challenges correlated with Zika and Chikungunya emergence

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Dengue is the most prevalent arbovirus disease worldwide. Climate is considered an important factor in the temporal and spatial distribution of vector borne diseases. Recent epidemic outbreaks of arboviruses, such as Zika and Chikungunya, promoted an alert to health authorities towards those diseases. Thus, this study evaluated the clinical characteristics and serotype co-circulation from 2007 to 2015 in Paraíba state, Northeast Brazil. Alongside analyzed the correlation between rainfall and dengue cases during 2007 to 2014. Clinical characteristics and classification were obtained from Information System for Notifiable Diseases (SINAN) reporting files. The detection and genotyping of DENV was done using *reverse transcription polymerase chain reaction (RT-PCR)*. Data of rainfall were collected monthly. The monthly incidence of dengue cases was calculated by year/100,000 inhabitants. In order to identify the influence of rainfall and dengue cases different distributed lag models were considered. Our results demonstrated that Dengue Fever/Dengue classification was the most common clinical feature (97.9%). DENV 1 was the most identified virus (80.48%) in all studied years and co-circulation of the four DENV serotypes was observed in 2013 and 2014. Also the correlation between rainfall and dengue cases occurrence showed increase in the first months after the rainy season. Our findings support the hypothesis that the four DENV serotypes co-circulation may be one of the reasons for the increased occurrence of severe dengue. Furthermore, we observed increased dengue notifications in 2015, possibly due to the rise of Zika and Chikungunya cases with similar symptomatology. In addition, the relation between rainfall and dengue cases was significant with a lag of three months. Thus, this study may be useful to the future development of health policy and financial resources toward arboviruses control and prevention.

**Keywords:** DENV Serotypes, Arboviruses, Rainfall.

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