

# Prediction of Dengue cases in Five Municipalities of Santander, Colombia using machine learning models

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## Abstract

Arboviral diseases are those transmitted by arthropod vectors with significant representation in the high burden of disease in the world, including the Americas. Therefore, it is important to focus efforts on the surveillance of vectors and the diseases they transmit, in order to implement preventive strategies to mitigate their impact on the population. Considering that, Colombia is a country with suitable conditions for the presence of these diseases, and Santander is one of the departments with the highest presence of dengue cases. The purpose of this research is to develop a framework for the prediction of dengue cases per week in five municipalities in the department of Santander, Colombia, using rainfall as a predictor variable. An important part of the work is the comparison of Machine Learning models for prediction, such as the visualization of the models using the Power Bi tool (Microsoft) with embedded code Python and R. Different ML models were implemented, here only three models are presented: ARIMA, Recurrent Neural Networks (RNN) and Neural Networks with Long- and Short-Term Memory (LSTM). The results show satisfactory predictive accuracy that can help different government entities in the public health decision process.

**Keywords:** Machine learning, Arboviral diseases, Dengue, Public Health.

