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Big data paradigm applied to epidemiological surveillance in Santander, Colombia

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Surveillance, which is an essential feature of epidemiological practice, is the result of the collection, validation, analysis, and interpretation of health and disease data. The value of surveillance implies the effective and efficient delivery of useful information. In that sense, surveillance systems must be flexible because of the increasing information needs. They also must use the appropriate technologies to disseminate data opportunely. To address the gap in health knowledge, public health surveillance can benefit from advances in information sciences and technologies, as well as the increase of databases and data sources. In order to support the decision making of public health authorities, a framework is developed as a guide for epidemiological surveillance in the stages of analysis, interpretation of data, and dissemination of information. This framework is based on big data paradigm, adopting data mining techniques to discover patterns and trends, and machine learning to build predictive models. It also uses the key stages of knowledge discovery in databases (KDD). Initially, a literature review is made in scientific databases to identify the relationship between epidemiological surveillance and big data, the factors that influence the epidemiological events, and the different techniques of data mining and machine learning. Subsequently, the acquisition of databases is carried out according to the factors identified in the literature. Finally, the framework is built and applied in a case study of a critical public health event in Santander (Colombia) as is the dengue virus.

Biography

Yuly Andrea Ramírez Sierra got her degree in Industrial Engineering in 2014 from the Industrial University of Santander, Colombia. She is part of the research group on Optimization and Organization of Productive and Logistic Systems-OPALO. Currently, she is studying a master degree in Industrial Engineering, and has published an article that evidences the application of data mining techniques and multivariate analysis.

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