Predictive Analytics Algorithm for the Health System

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Inadequate hospitalization projections increase the cost of health care and reflect the ineffectiveness of the healthcare services in the primary care setting (Mkanta, 2016). Studies have concluded that in 2013 well over $224 million dollars were spent on hospital admissions (Department of Health, 2016). Thus, the overarching research question is: Is it possible to use hospitals' statistics to predict hospitalizations? This research proposes a mathematical model to develop a breakthrough algorithm that can predict the number of patients who will be admitted to a hospital. Statistics from the Puerto Rico Health Insurance Administration (PRHIA) were used; they record the number of patients that have health insurance. Through the data mining process, we sorted the dataset to identify patterns and establish relations through data analysis. Data Analysis Expression (DAX) was used as the programming language to adapt the algorithm to the app. Finally, we used predictive modeling and analytics to examine the current and historical events in order to test the hospitalization prediction accuracy. The results demonstrated that by using the exponential smoothing algorithm we can predict how many patients will be admitted to hospitals, as well as their possible diagnoses on a monthly basis, with a ninety-five percent (95%) confidence. Our findings could help to a broader discussion on health profiles in Puerto Rico and the use of technology and predictive analytics to improve healthcare planning and prevention.

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