Pilot 1: Comorbidities - Main goals and technological development

Main goals
Understand how chronic diseases influence each other and provide a more accurate mortality and hospitalization risks for a specific patient. Our main data source are around 4 million EHRs of the Valencian Region population over a timespan of 5 years. Using this data, we have identified clusters of diseases, i.e., patients that share similar diagnosis of relevant chronic diseases and conditions. The impact of the clusters of diseases with additional influential variables in each patient will provide useful information to physicians for intensifying controls and therapies to reduce the impact of chronic diseases.

Pilot overview

1. Retrospective analysis
   Big data infrastructure
   Design & Deploy a BigData Infrastructure to anonymize, store and process 4 million EHR from the Valencian Region.

   Mathematical-Statistical Analysis
   Clean, prepare and study EHR data in order to find how patients are grouped by a set of candidate diseases (Comorbidities)

2. App and tools development
   We will develop an app to take an informed decision related to cluster of chronic disease

3. Prospective analysis
   Pilot deployment
   We will involve primary care physicians from a Valencia health department in order to test the app developed

   KPI assessment
   The pilot partners will assess the evolution of KPI across the pilot

Clustering methodology
The groups of diseases are obtained by means of a hierarchic graph where each node in a level represents a more refined group of comorbidities from the immediately upper node it belongs to. These groups of comorbidities are formed only if there is a statistical difference between the target with the comorbidities group in study and the previous upper and more general group. This groups are formed by using statistical inference techniques that help us to discover statistical differences between groups.

Analytics workflow

App development. Visualization

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