

## **Capstone Project Proposal**

Question: Can I predict hospital ratings based on risk adjusted mortality rates, number of deaths, number of cases, medical procedures performed and medical conditions treated for 2012-2013?

Dataset: California Hospital Inpatient Mortality Rates and Quality Ratings, 2012-2013 is available from <https://chhs.data.ca.gov/Healthcare/California-Hospital-Inpatient-Mortality-Rates-and-/rpkf-ugbp>.

Description of dataset: The dataset contains risk-adjusted mortality rates, and number of deaths and cases for 6 medical conditions treated (Acute Stroke, Acute Myocardial Infarction, Heart Failure, Gastrointestinal Hemorrhage, Hip Fracture and Pneumonia) and 6 procedures performed (Abdominal Aortic Aneurysm Repair, Carotid Endarterectomy, Craniotomy, Esophageal Resection, Pancreatic Resection, Percutaneous Coronary Intervention) in California hospitals for 2012 and 2013. This dataset does not include conditions treated or procedures performed in outpatient settings.

Importance: Using hospital ratings, patients are able to make a better decision in what hospital they want to get treated and where the best care is available in California, based on overall hospital performance and based on particular medical conditions or procedures.

Approach: Hospital ratings have three categories: as expected, better and worse.

- 1) I will create summary which hospitals have the best and worse overall ratings among all conditions and procedures based on the data available for 2012-2013, and then map these findings.
- 2) I will analyze which condition or procedure has the best or worse hospital ratings, and map these results only for selected conditions or procedures.
- 3) To predict hospital ratings I will use classification decision trees, random forests or multinomial logistic regression. First, I will use three models to train them on 2012-2013 data and access which model gives the best performance on the training data, then I will test three model performances on 2014 test data.

Deliverables:

- 1) Recommend to patients which hospital has the best overall ratings in state of California;
- 2) Recommend to patients which hospital has the best ratings for particular medical condition or procedure in state of California;
- 3) Recommend which hospital will have the best care in the future using predicted hospital ratings.