

# Project Proposal

## BMI 6106-Introduction to Probability and Statistics

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### HAI Background

About 5% of all hospital admissions in the United States result from a Healthcare-Acquired Infection (HAI).<sup>1</sup> This is a significant and surprising proportion considering hospitals are supposed to be places to treat infections and other ailments, not be a source of spreading them. These infections can be spread through devices such as central lines and urinary catheters, or from one patient to another after contact with an infected person or surface.

### Dataset Information

The Center for Medicare and Medicaid Services (CMS) has implemented a program to help reduce HAIs: the Healthcare Acquired Condition Reduction Program (HACRP)<sup>2</sup>. With this implementation, HAIs have been tracked and these are available by hospitals: the CMS “Healthcare Associated Infections - Hospital” dataset<sup>3</sup>. The primary features this dataset provides for each HAI instance: what hospital the infection was found in, State, County, what kind of infection, the Healthcare Acquired Condition (HAC) score which CMS uses for HACRP, how the HAC score compares with the national average, and the start and end dates of the infection.

### Predictions/hypothesis/goals

#### Predictions and Hypotheses:

- Using the score for facility, we can predict how likely it is to have a higher incidence of HAI as compared to facilities with a score that is better than their score
- This dataset may reveal regional differences in HAI prevention measures, with some states performing better or worse than others.
- It can also be used to identify factors that contribute to HAI, such as hospital location.

#### Goals:

- Identify high-performing facilities that can serve as a model for others to follow.
- Highlight areas where healthcare needs to improve their performance.

## Sources:

- [1] <https://epi.dph.ncdhhs.gov/cd/hai/figures.html>
- [2] <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/HAC-Reduction-Program>
- [3] <https://data.cms.gov/provider-data/dataset/77hc-ibv8>