

Resisting Resistance:

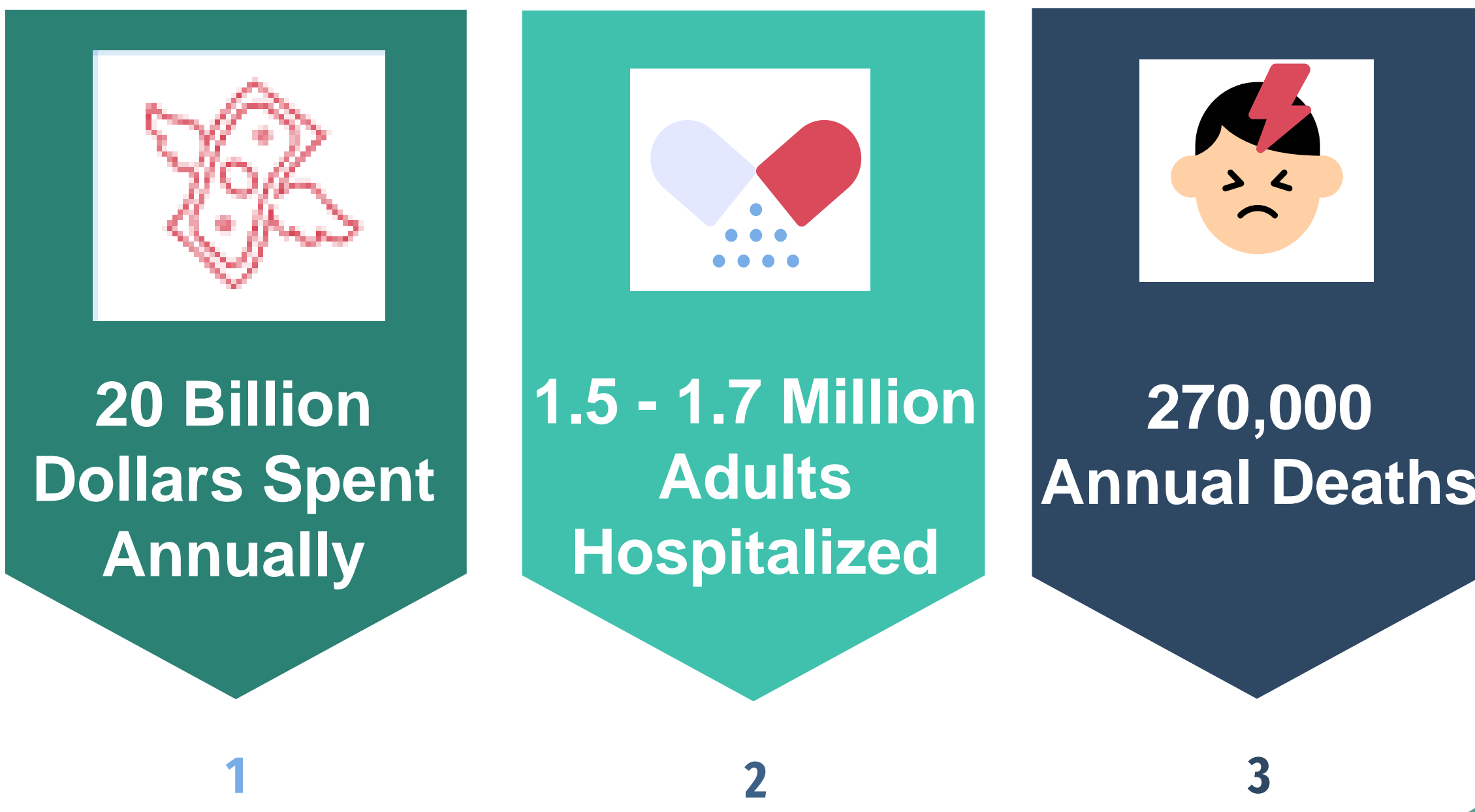
Using Machine Learning to Optimize Antibiotic Treatment

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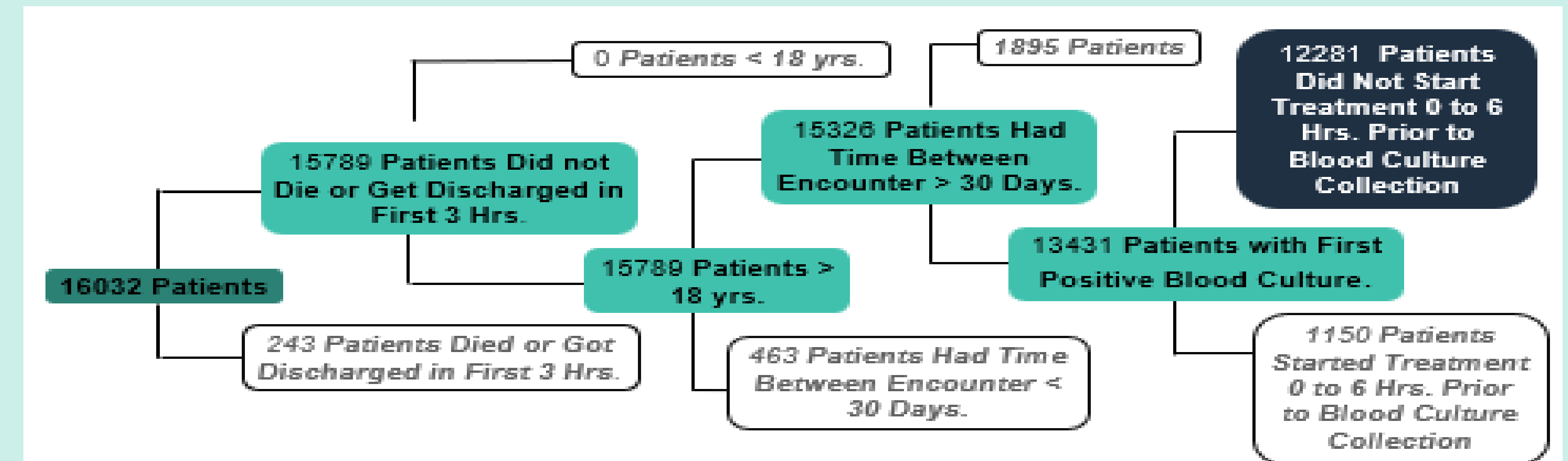
PROBLEM :

Delay in starting antibiotics for sepsis patients with blood stream infection can be deadly.

Prompt, broad-spectrum treatment can lead to antibiotic resistance



Inclusion/ Exclusion Criteria :

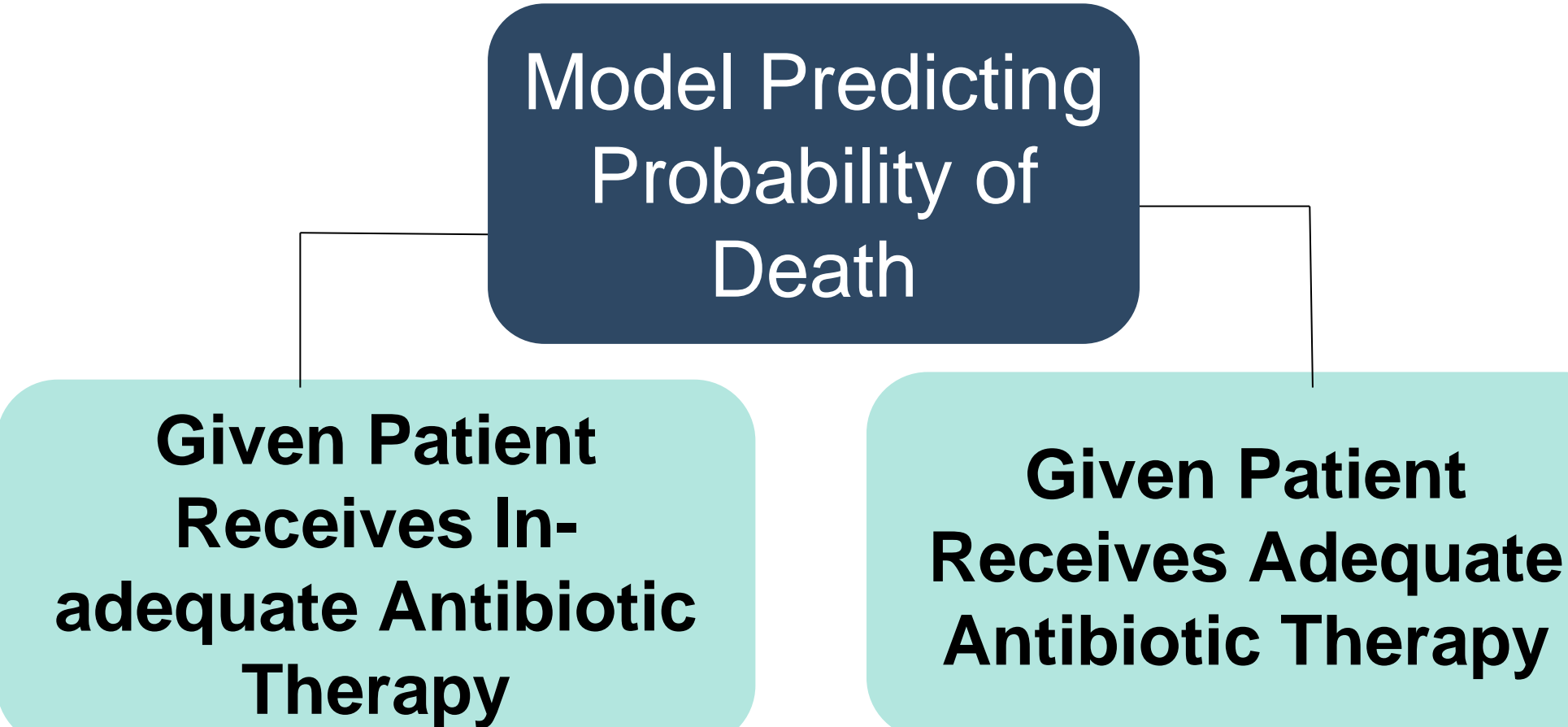


NEED :



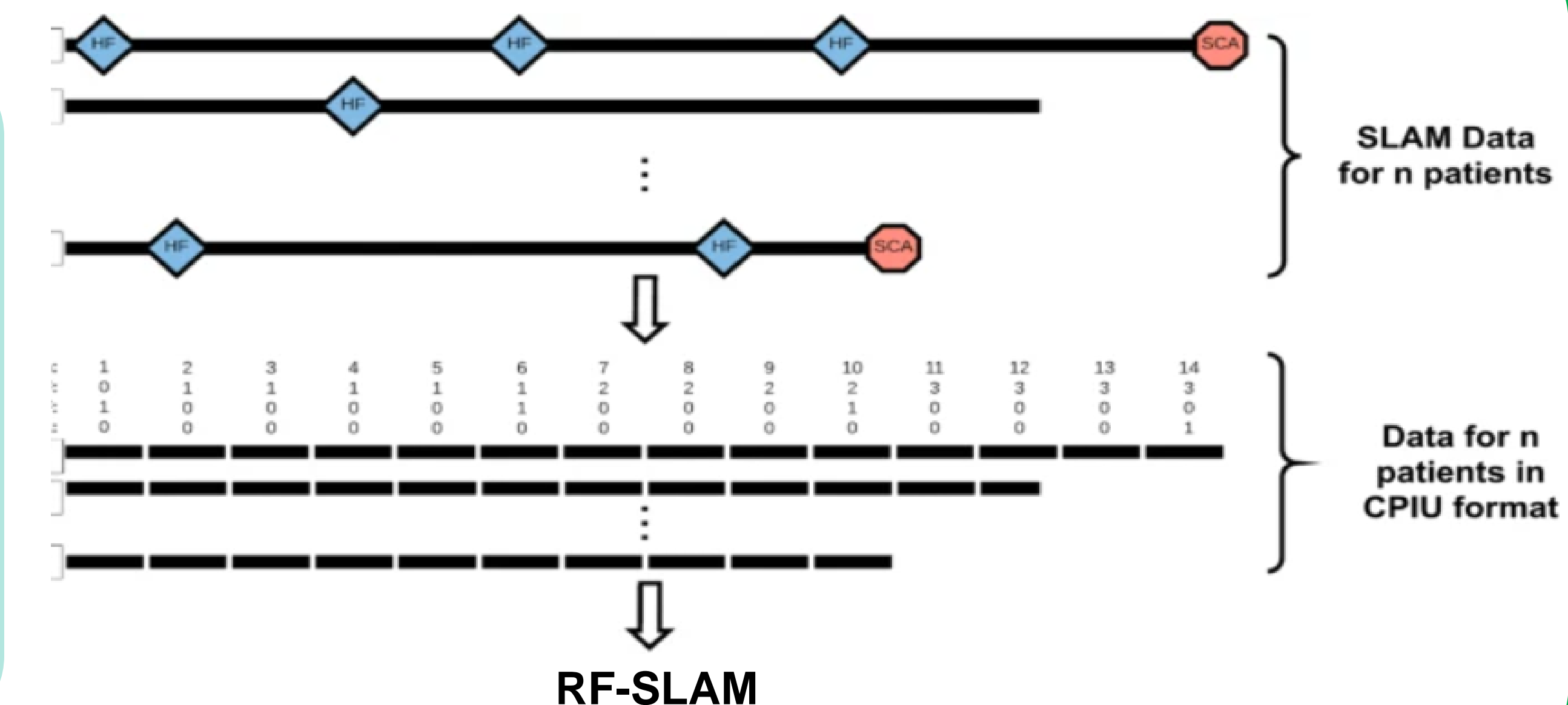
Clinicians need a tool that will aid in clinical decision-making by assessing the risks and benefits associated with a broad or narrow antibiotic therapy.

PROPOSED SOLUTION:



RF-SLAM :

- Includes time-varying predictors.
- Builds trees using data binned according to user specified lengths
- These bins are called CPIU
- Each CPIU contains predictors and outcomes of interest.

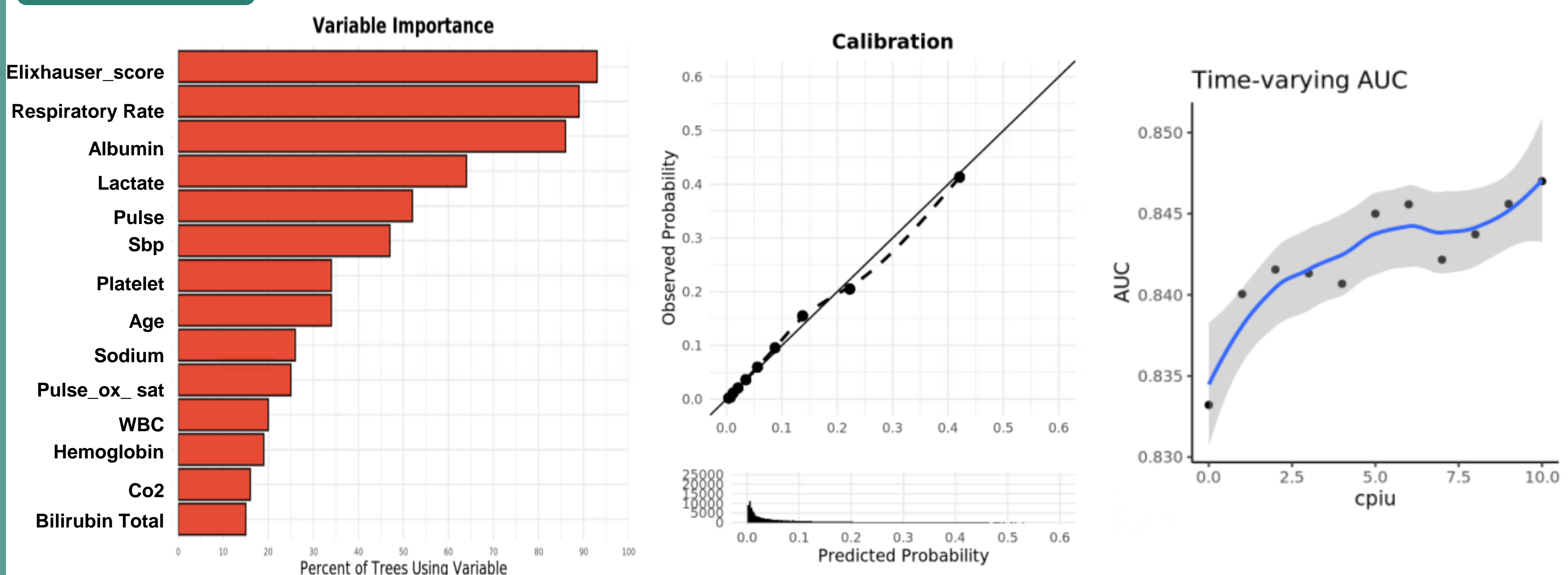


Schematic of RF-SLAM Methodology, Wongvibulsin, Shannon, Katherine C. Wu, and Scott L. Zeger. "Clinical risk prediction with random forests for survival, longitudinal, and multivariate (RF-SLAM) data analysis." BMC medical research methodology 20.1 (2020): 1-14.

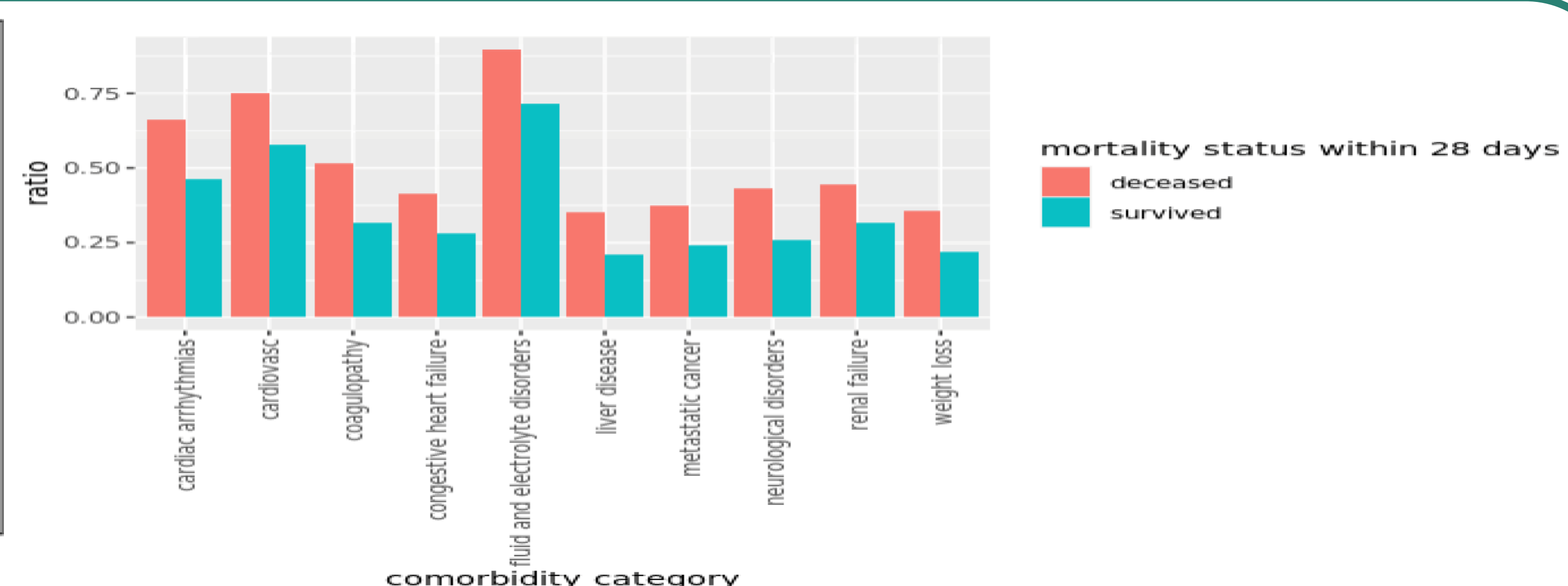
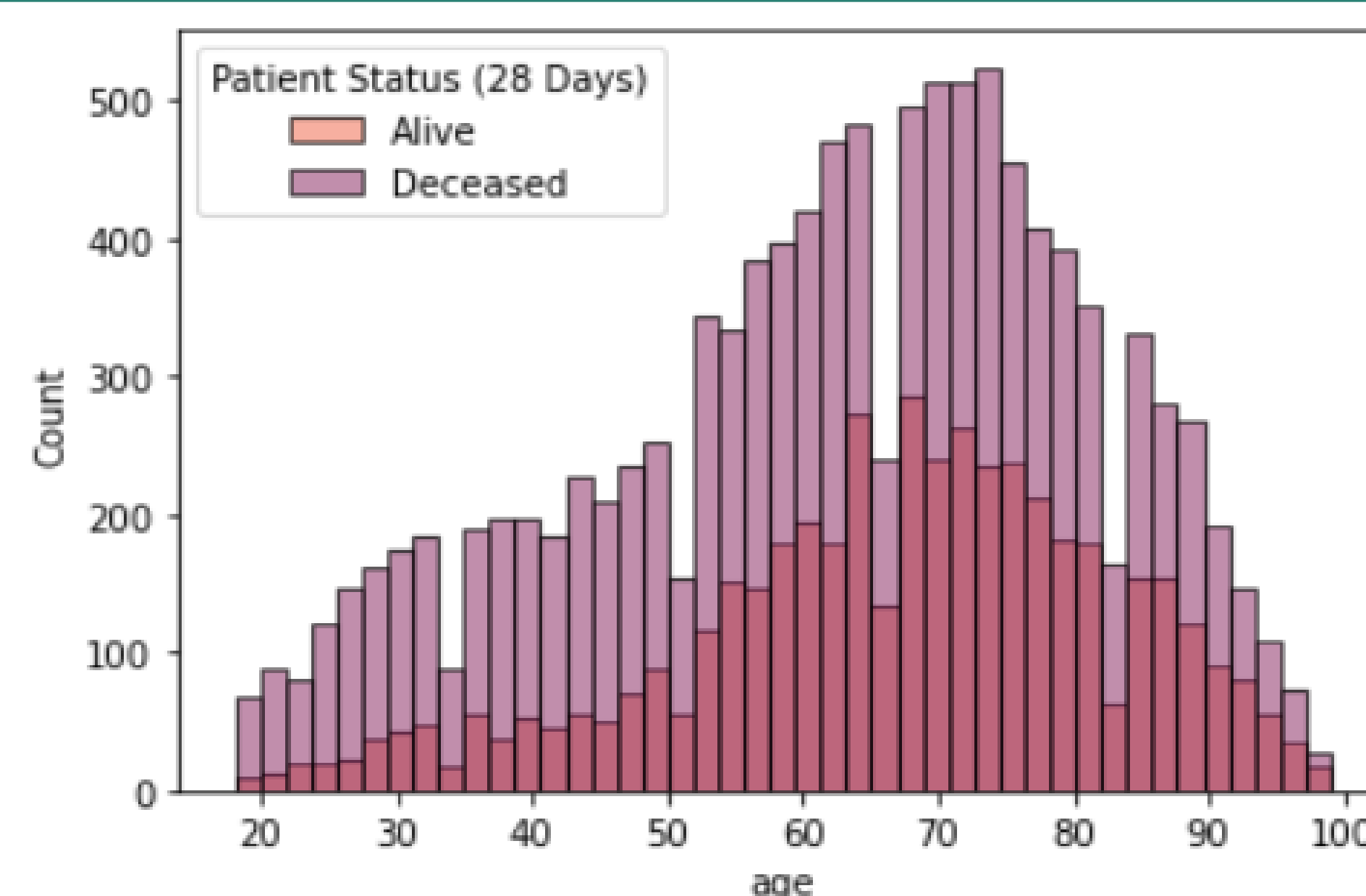
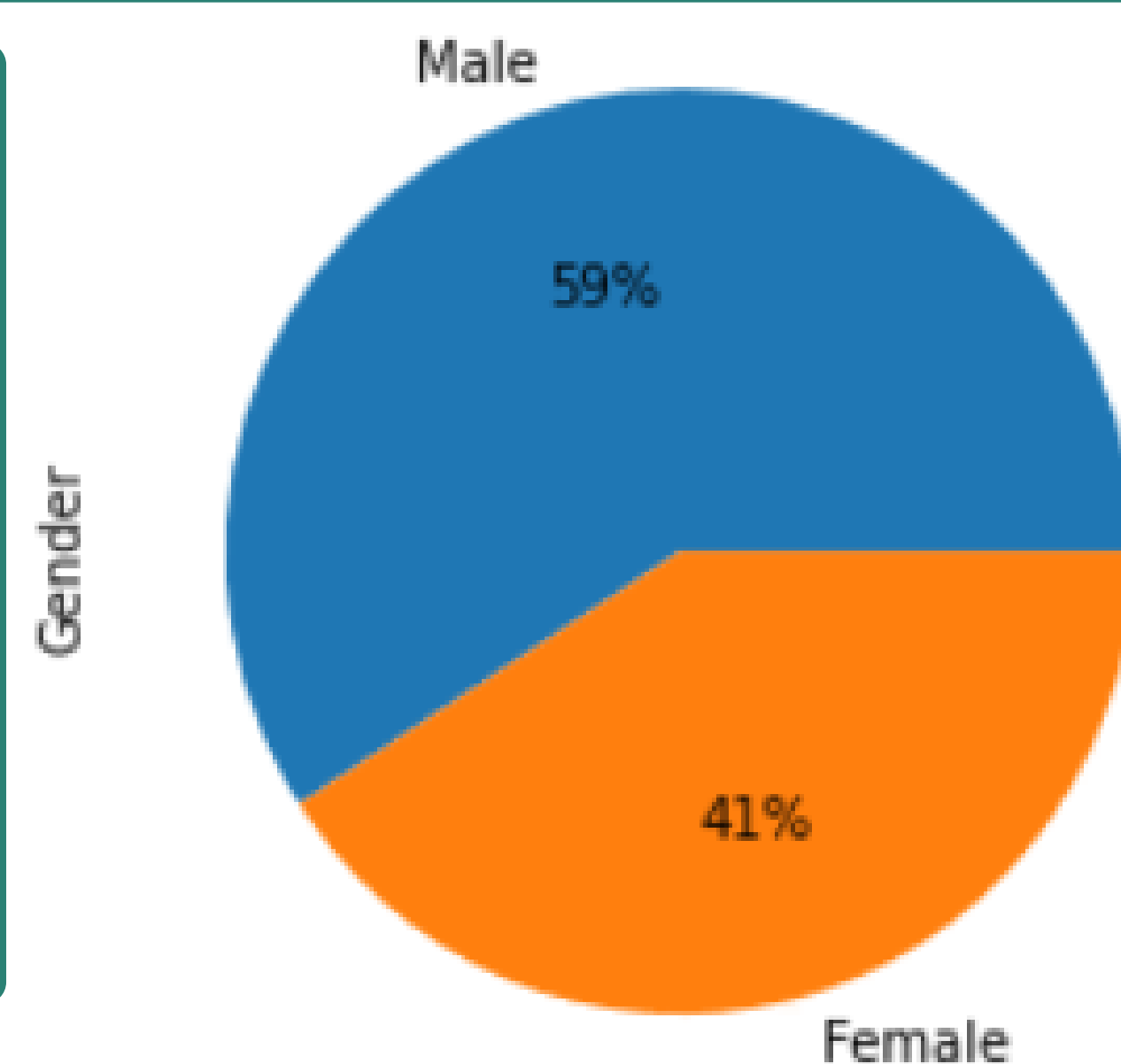
MODEL OUTCOME INTERPREATION:

Difference	Risk of Adverse Effects	Outcome
↑	↑	Depends on variety of other clinical factors like comorbidities
↑	↓	Broaden antibiotic spectrum given that risk is less, and survival maybe improved
↓	↑	Not to Broaden Antibiotic Spectrum, given that the change in survival is small
↓	↓	Not to Broaden Antibiotic Spectrum because of risk of developing antibiotic resistance in future

RESULTS :



Data Description



Need More Info. ?

