

DUHS Inpatient General Decompensation Prediction

Ziyuan Shen¹, Mengxuan Cui²

Instructor: Nicholas Giroux, Anders Dohlman
Department of Biomedical Engineering
Duke University

Mentor: Michael Gao
Duke Institute for Health Innovation

July 5, 2019

¹ziyuan.shen@duke.edu, Department of Electrical and Computer Engineering, Duke University

²mengxuan.cui@duke.edu, Department of Biomedical Engineering, Duke University

Content

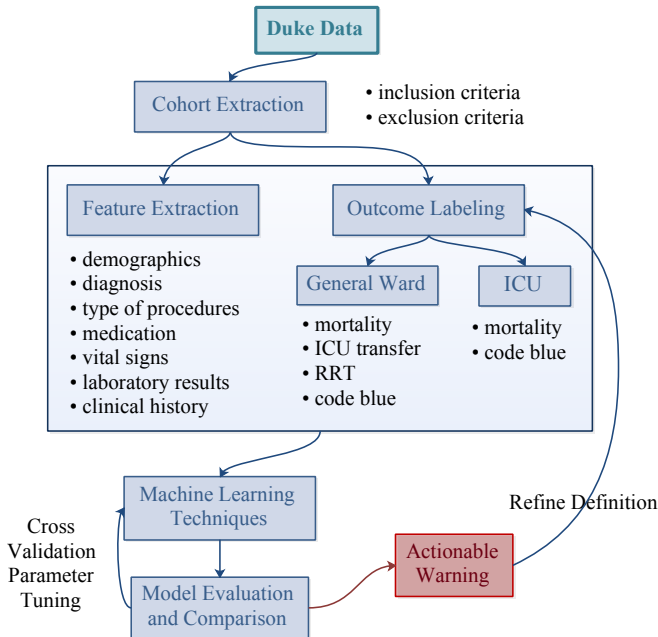
- Brief Review
- Cohort Extraction & Outcome Labelling
- Data Visualization
- Future Work Plan

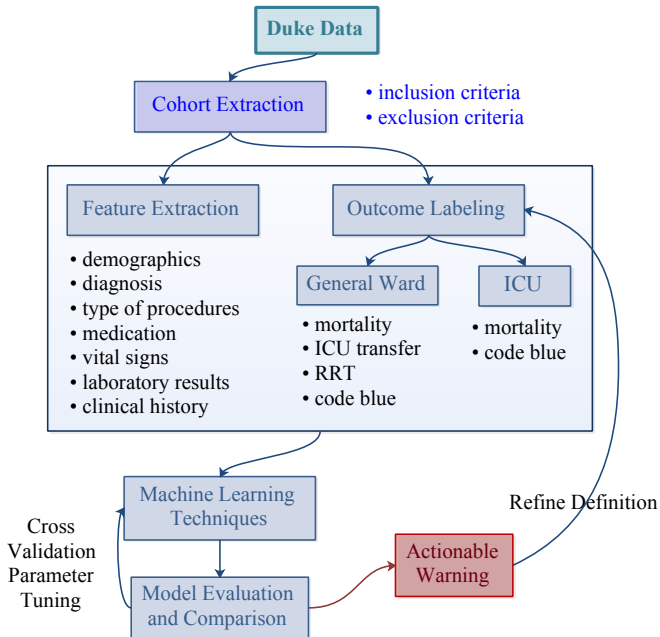
Content

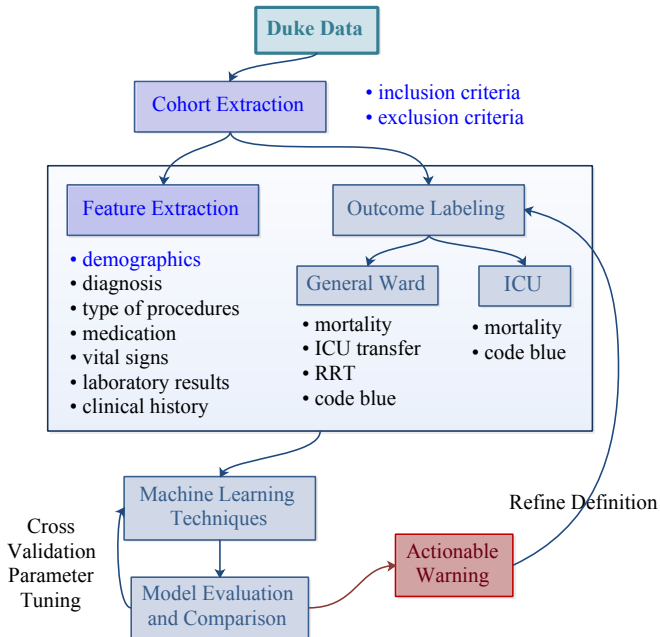
- Brief Review
- Cohort Extraction & Outcome Labelling
- Data Visualization
- Future Work Plan

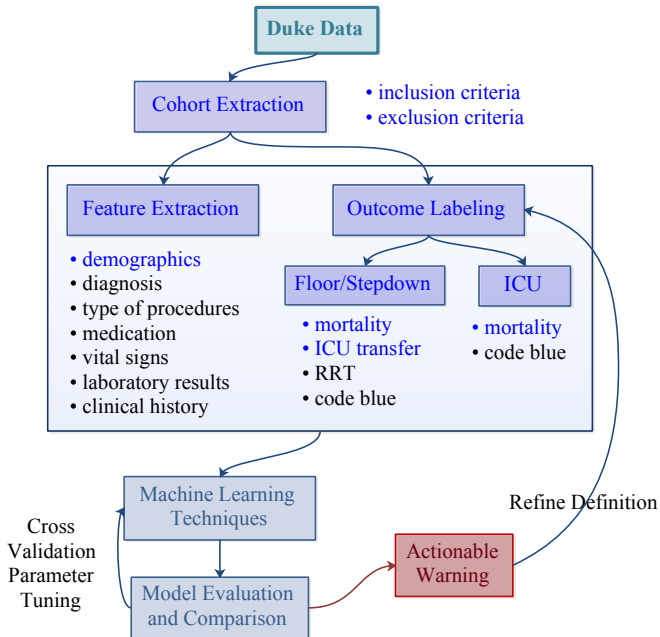
Purpose of Study

- 1 Define decompensation
- 2 Create a state-of-the-art of the machine learning model applied for decompensation detection
- 3 Reduce deterioration and standardize response protocols



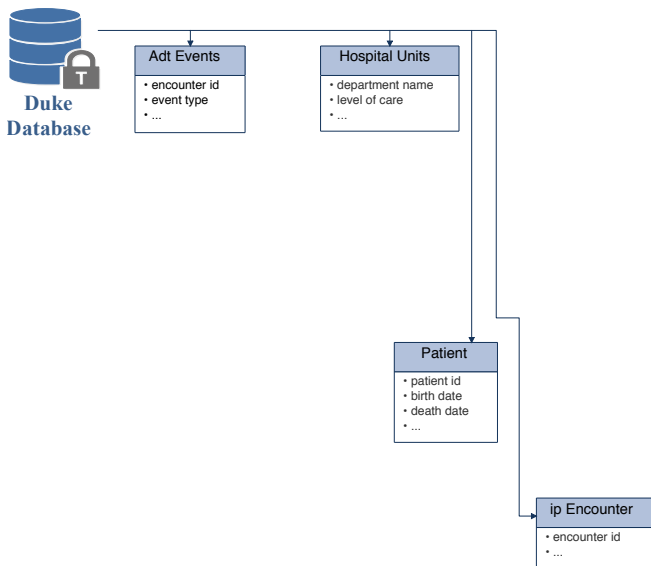


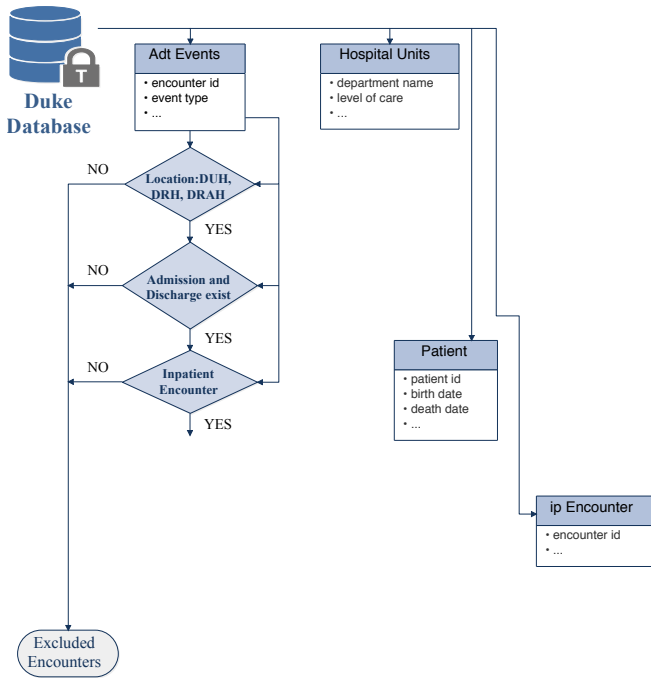


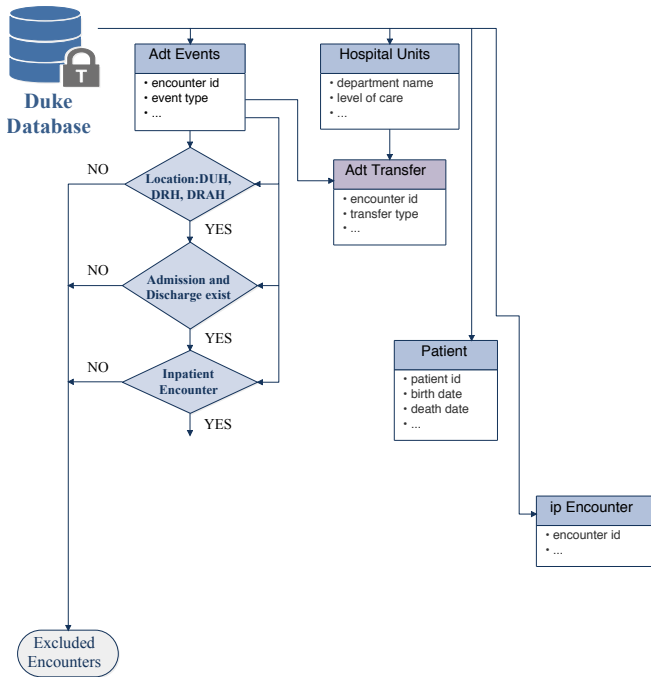


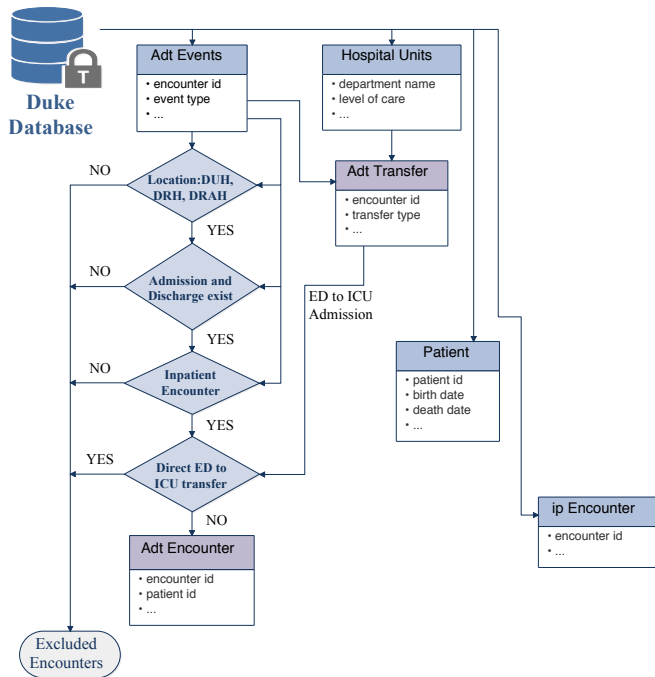
Content

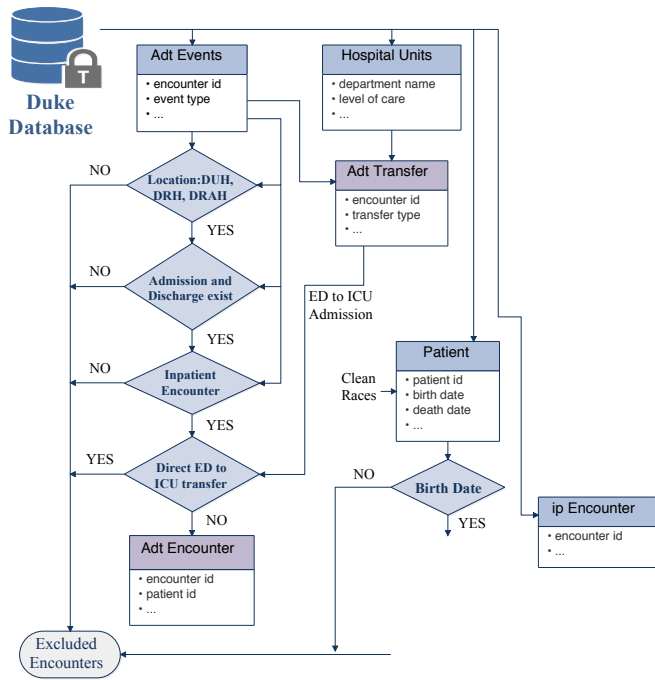
- Brief Review
- Cohort Extraction & Outcome Labelling
- Data Visualization
- Future Work Plan

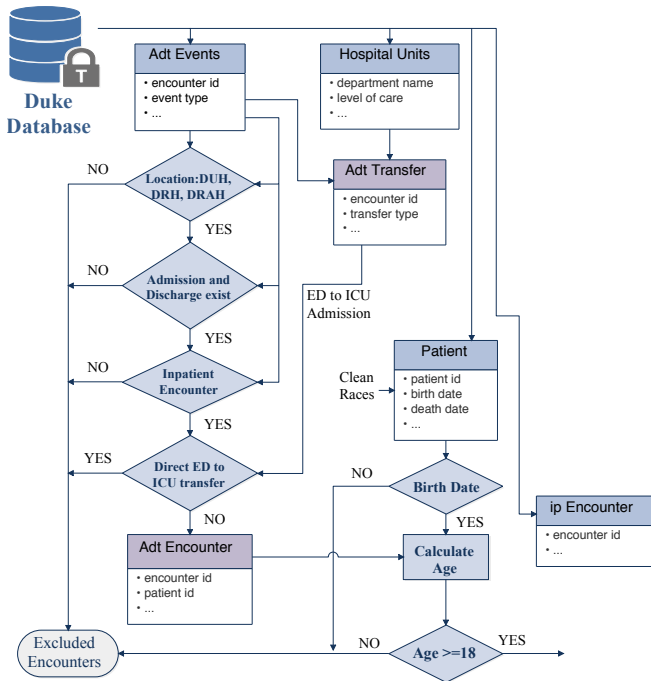


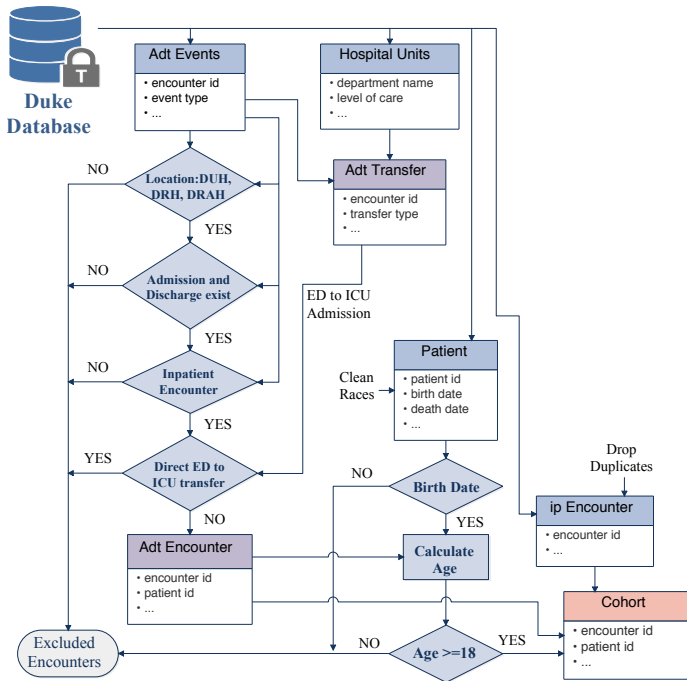


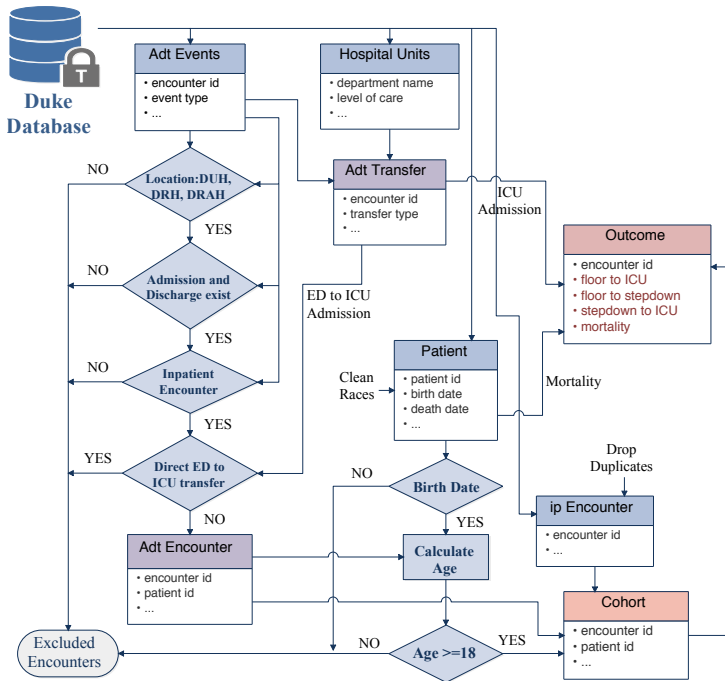










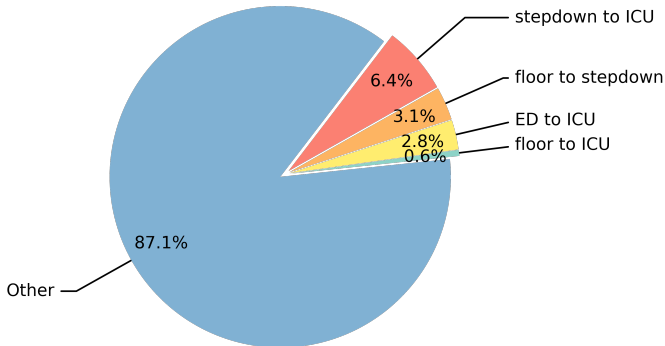


Content

- Brief Review
- Cohort Extraction & Outcome Labelling
- Data Visualization
- Future Work Plan

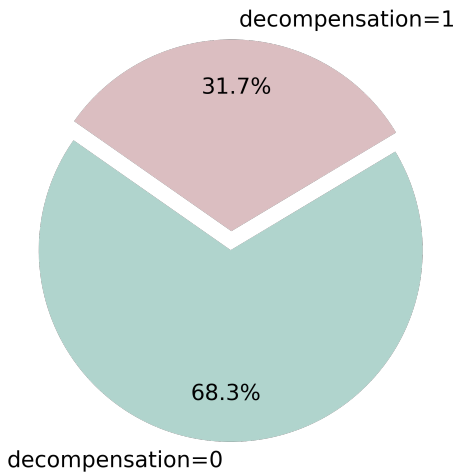
Outcome

Transfer Types Percentage Across All Unit Transfers

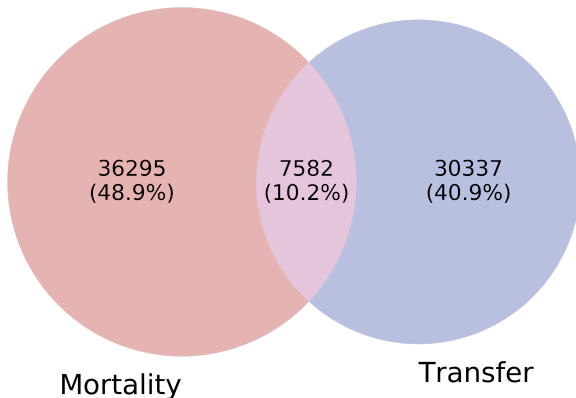


Outcome

Cohort Decompensation Across Encounters



Decompensation Composition

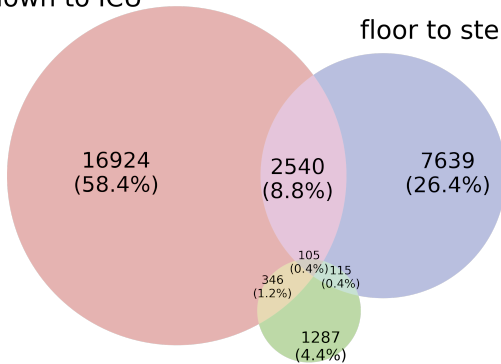


Outcome

Transfer Type Composition

stepdown to ICU

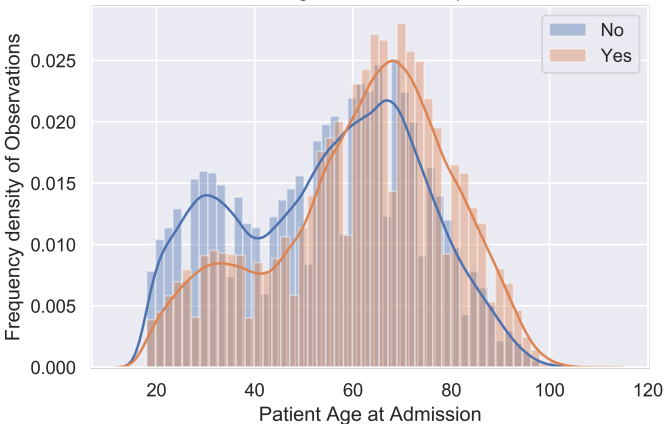
floor to stepdown



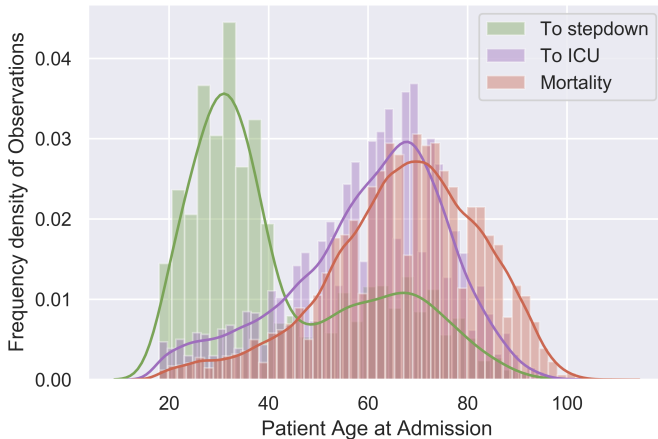
floor to ICU

Demographic: age

Distribution of Patient Age Across Decompensation Occurrence

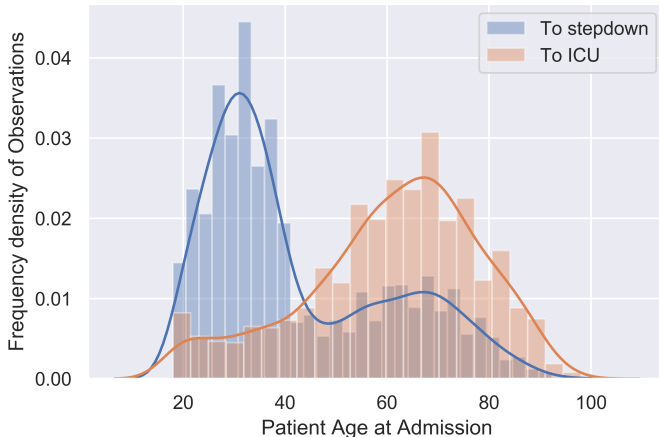


Demographic: age

Distribution of Patient Age Across Cohort
Suffered Decompensation

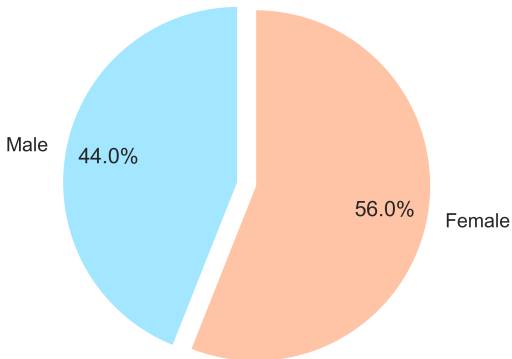
Demographic: age

Distribution of Patient Age Across Cohort
Transferred out from Floor

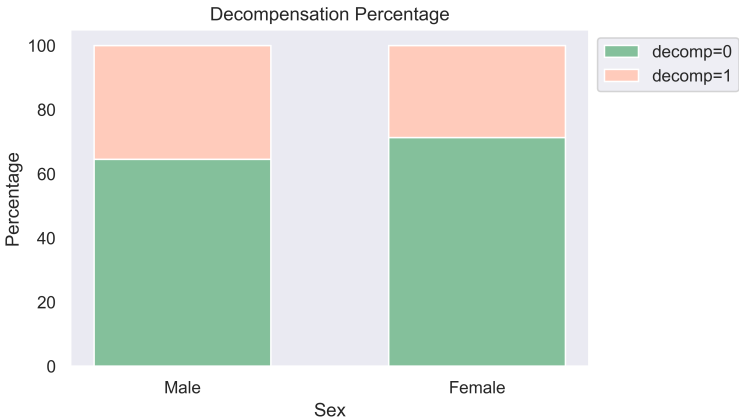


Demographic: gender

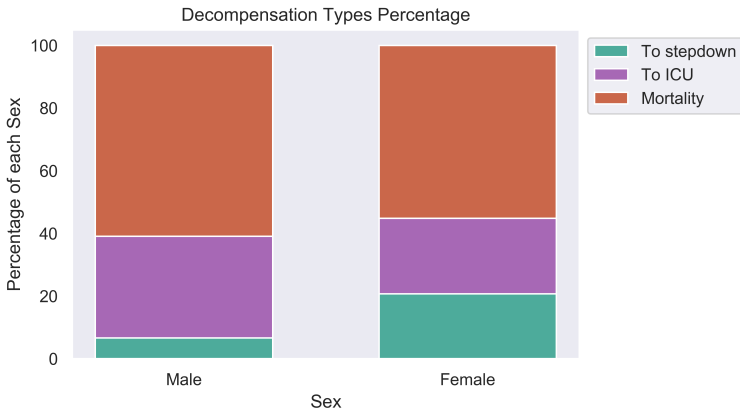
Patient Sex Across Encounters



Demographic: gender

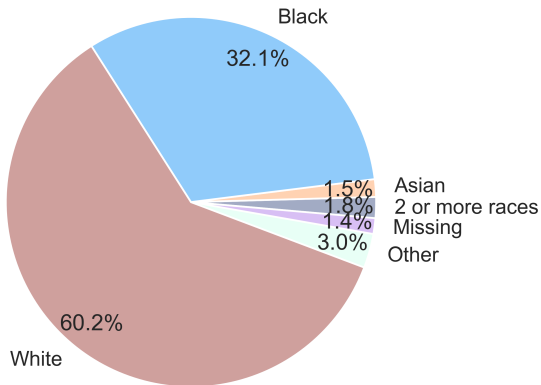


Demographic: gender



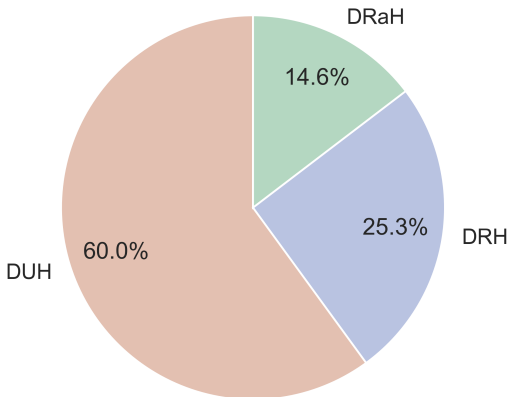
Demographic: race

Patient Race Across Encounters

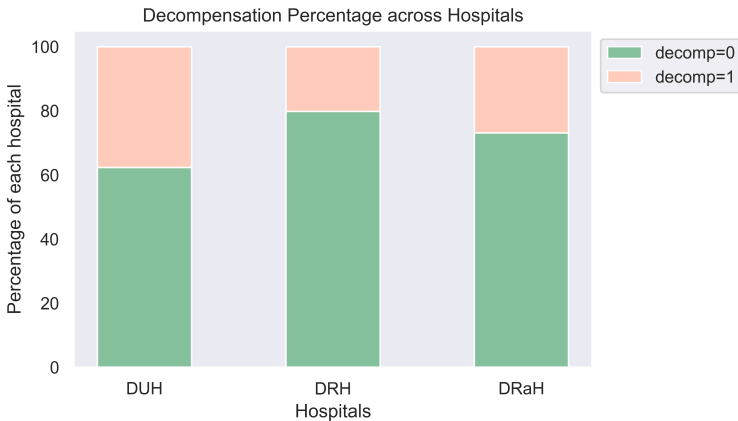


Admission Hospital

Encounters in Each Hospital

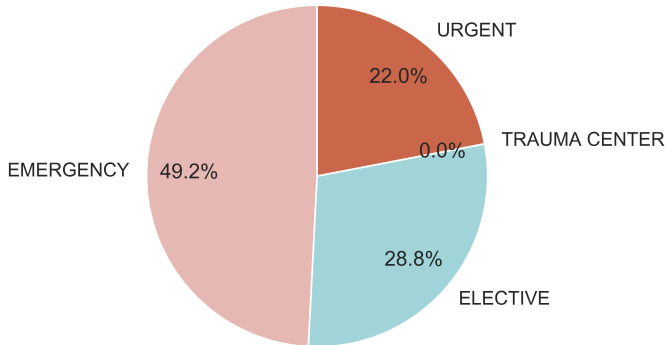


Admission Hospital

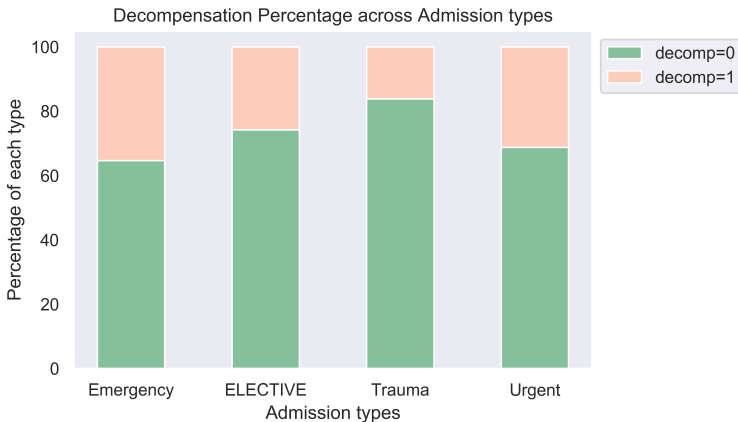


Admission Type

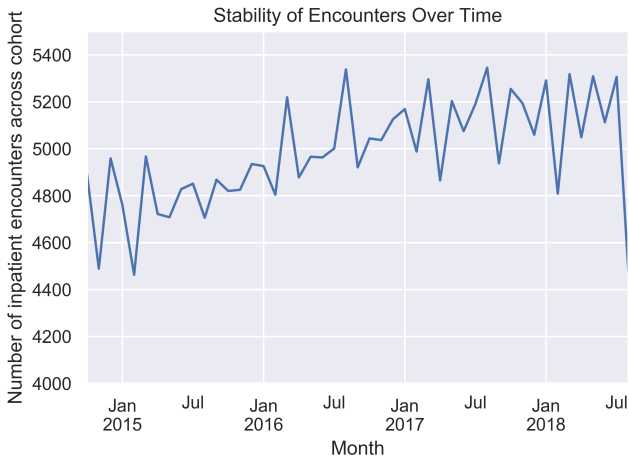
Admission Type Across Encounters



Admission Type

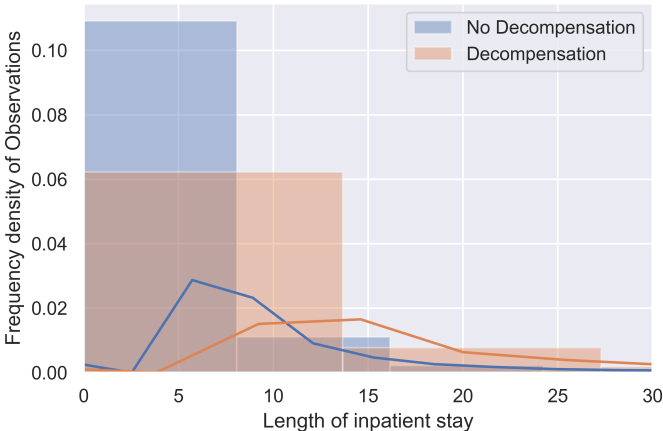


Stability of Encounters



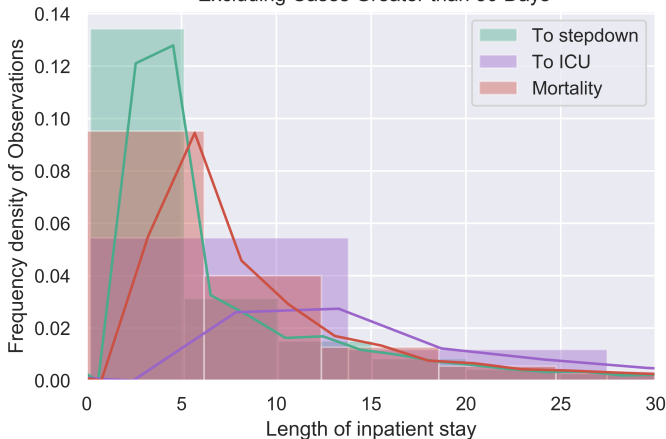
Length of Stay

Distribution of Inpatient LOS (days) Across Cohort
Excluding Cases Greater than 30 Days



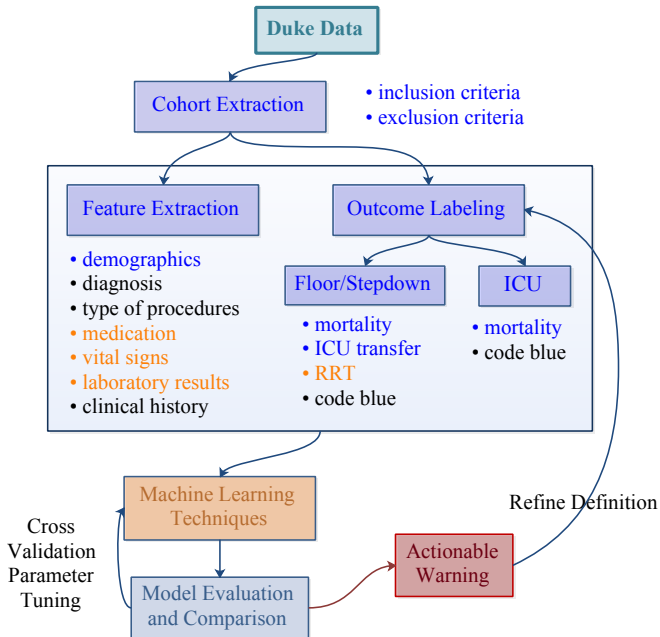
Length of Stay

Distribution of Inpatient LOS (days) Across
Cohort suffered Decompensation
Excluding Cases Greater than 30 Days



Content

- Brief Review
- Cohort Extraction & Outcome Labelling
- Data Visualization
- Future Work Plan



Thank you for listening!

Q&A