Methodology

> Choose features

> Clean data

> Patient segmentation

> Effects of dialysis on mortality rate

> Recommendations

Choosing features

- Domain experts
  - Clinicians
  - Google

- Feature quality assessment
  - % of missing data
  - sensible?

```
age
apache_iv
apachescore
CREATININE_min
CREATININE_max
BUN_min
BUN_max
POTASSIUM_min
POTASSIUM_max
CHLORIDE_min
CHLORIDE_max
SODIUM_min
SODIUM_max
PLATELET_max
PLATELET_min
heartrate_max
heartrate_min
AVG_HEART_RATE
resprate_max
resprate_min
AVG_RESPRATE
nibp_diastolic_max
nibp_diastolic_min
AVG_NIBP_DBP
nibp_systolic_max
nibp_systolic_min
AVG_NIBP_SBP
temp_max
temp_min
AVG_TEMP
BICARBONATE_min
BICARBONATE_max
GLUCOSE_max
GLUCOSE_min
total_urineoutput
dialysis
actualicumortality
predictedicumortality
group
```

Data after cleaning

eICU, 7854 patients, 36 features

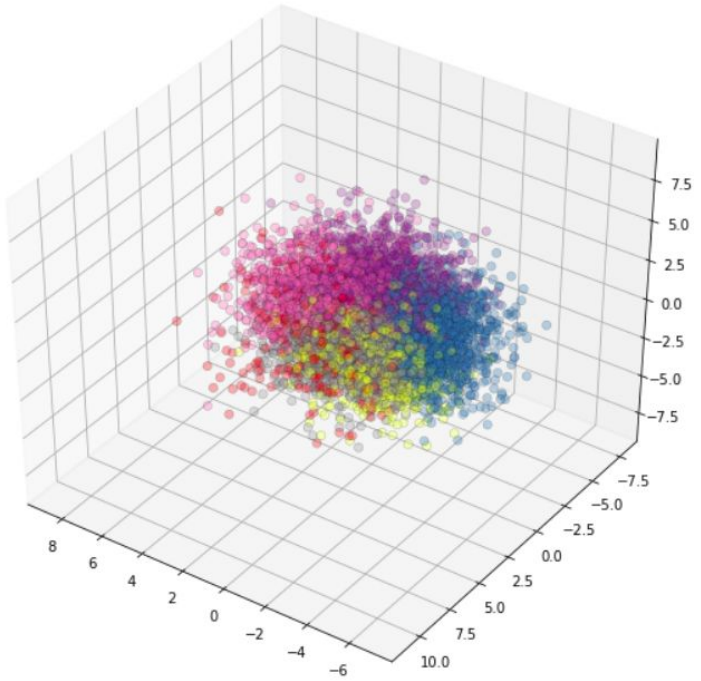
- Survival (in ICU)
  - 88% yes
  - 12% no
- Dialysis
  - 95% no
  - 5% yes

Normalized

- All features are normalized
  - (X - mean)/std_dev

Patient Segmentation

- K-means clustering
  - K = 6
  - 6 groups of patients



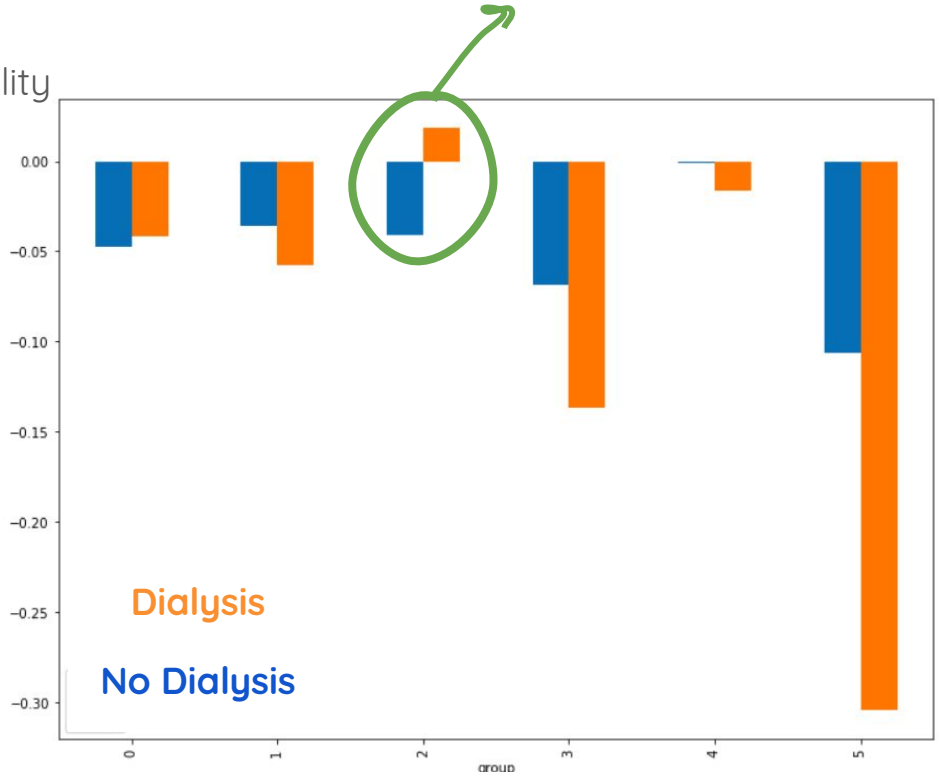
3D for visualization, we use all 36 features

Effects of Dialysis

Dialysis increases mortality rate! Group 2 patients do not respond well to dialysis.

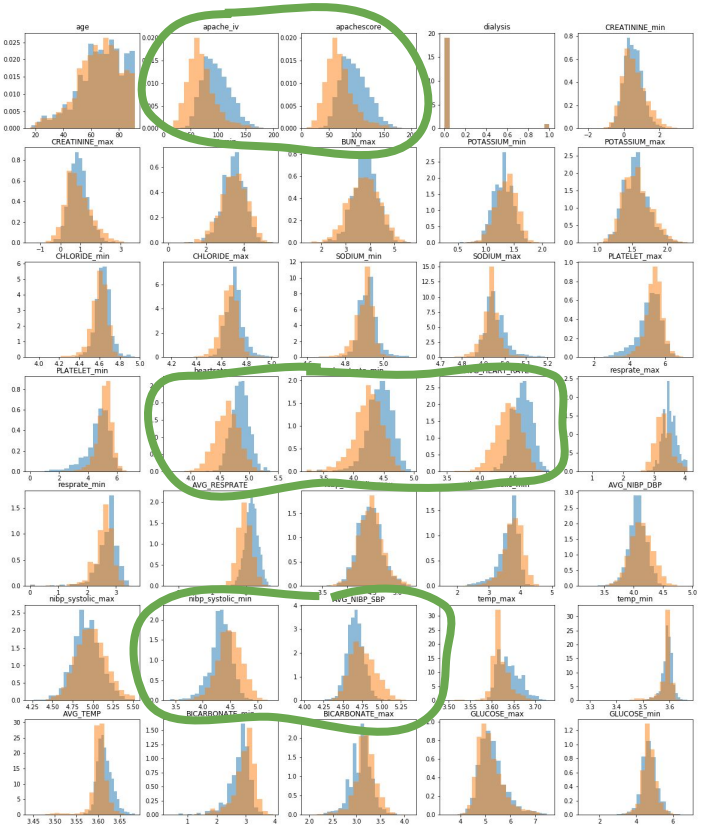
For each group:

- Predicted ICU mortality - Actual ICU mortality
- with dialysis and without dialysis

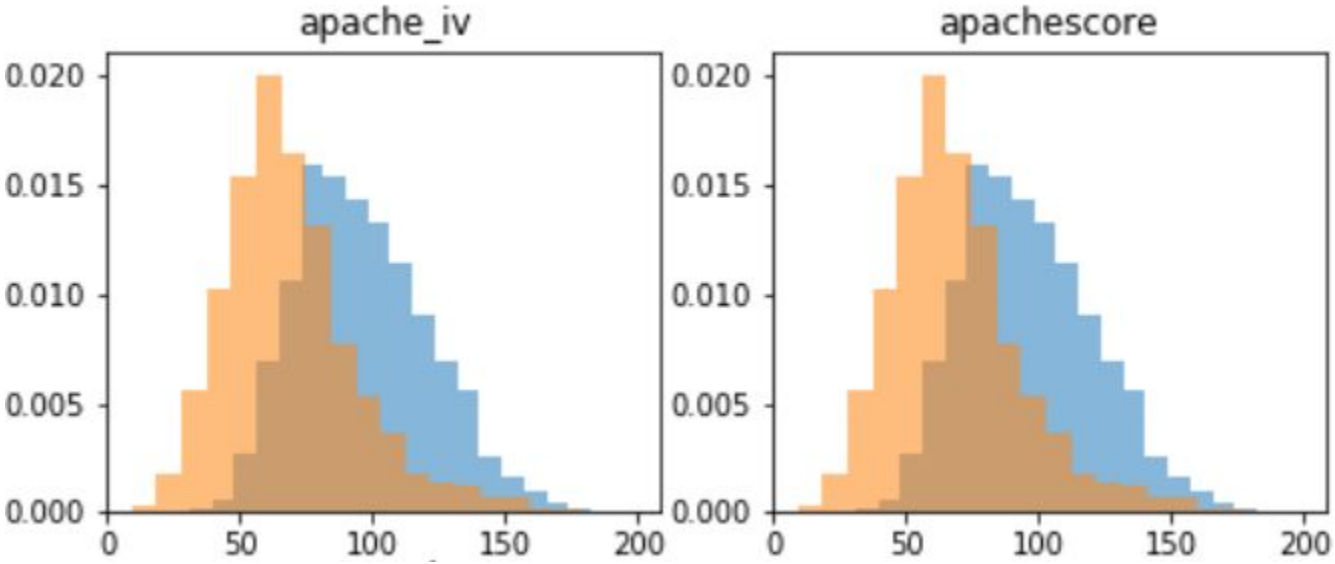


How is Group 2 different from the rest?

- Look at distribution of features
  - Group 2 vs. the rest



Group 2
lower APACHE scores!



<u>Group 2</u>

lower respiratory rate

lower diastolic blood pressure!