

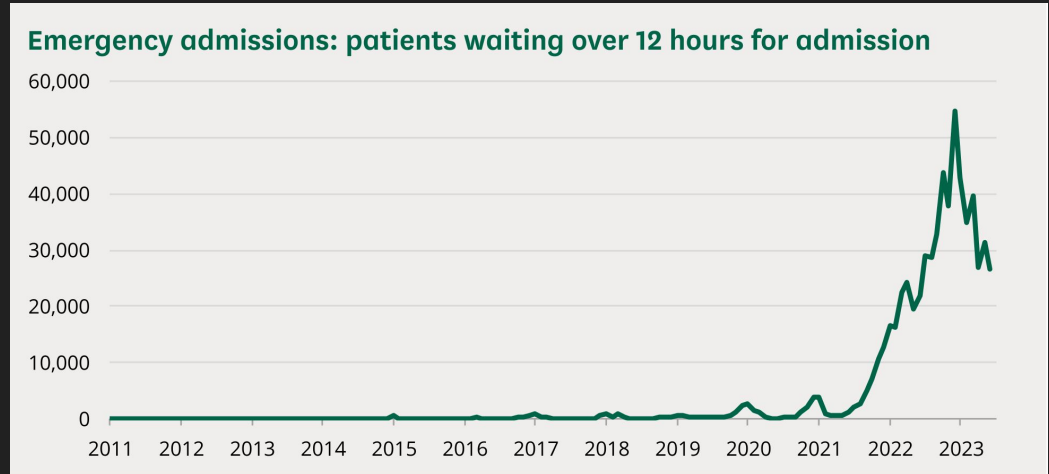
Using Machine Learning to Predict Hospital Admission

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Problem Statement

Can we predict whether a patient will be admitted into hospital using their medical history and personal data?

- Patients are spending more time waiting in A&E and for emergency hospital admission
- Limited resources mean patients in critical condition don't get the care they need



Impact

Patients:

- Could help patients in critical need of care get it faster
- Patients with lower likelihood of hospital admittance don't need to wait only to be sent home
- Likelihood of hospital admittance can be calculated remotely, saving potentially dangerous journeys

Hospitals:

- Emergency medical staff can use their time more effectively
- More efficient resource allocation
- Cost savings
- Higher quality of care
- Less strain on healthcare services in national health crises such as pandemics

Methodology

1. Use logistic regression to determine around 30 of the most influential factors
2. Train a model to predict hospital admission using a proportion of the input data from the group found above
3. Test the model on an unseen portion of the data
4. Iterate the model to improve accuracy, using more sophisticated machine learning techniques as we learn more about the data
5. Assess the accuracy of the final model, and its possible efficacy in real world scenarios

The Data

- > 500,000 patients
- 1000 attributes for each patient
- Attributes split naturally into groups such as demographic and medical conditions
- Patient sample largely representative of US population

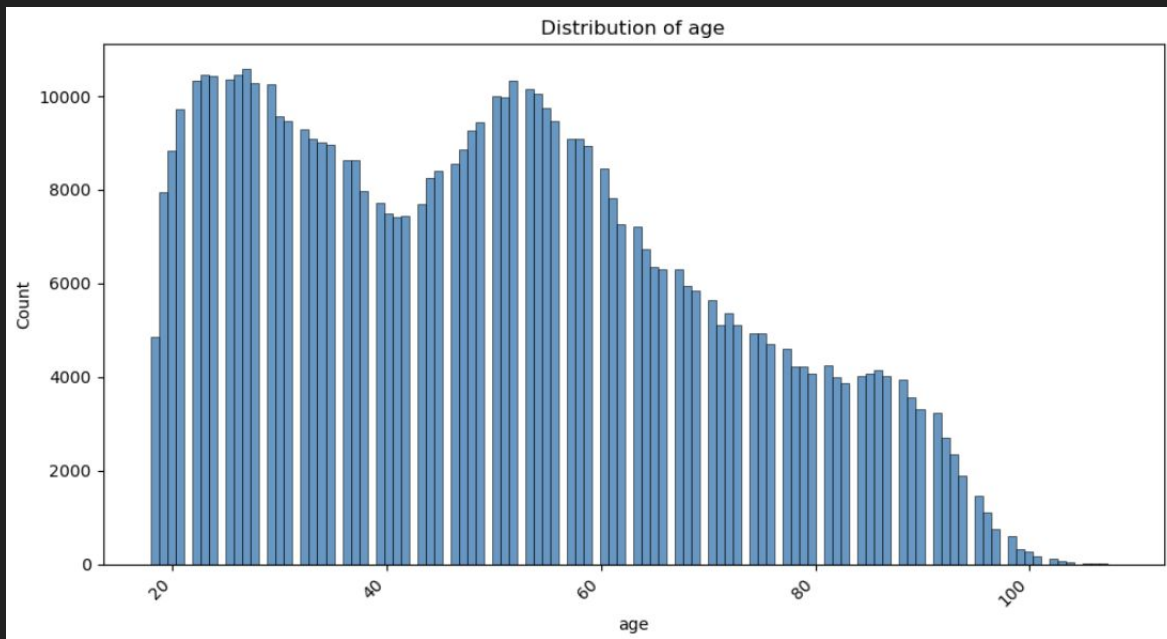


Figure shows the distribution of age in the dataset.

Next Steps

- Clean remaining datasets
- Perform further EDA on each dataset
- Run logistic regressions to determine main group of attributes
- Build an initial model using the key attributes
- Iterate the model, increasing complexity and accuracy with each iteration