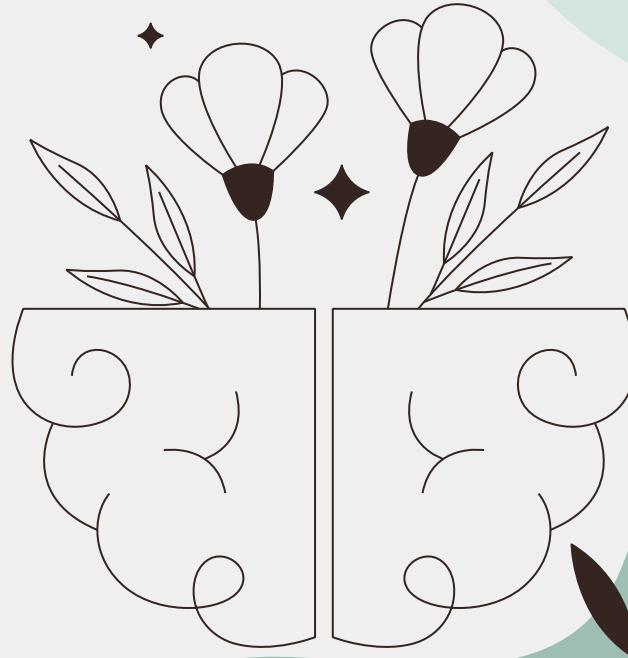


Predicting Chronic Diseases from Personal Wearable Devices

Danielle Louie

November 25, 2025



Introduction



Health

Increasing public accessibility, knowledge, understanding of medical data for a healthier future.

(ex: Apple Watches, Health App)



Tech

Harnessing advancing technology to provide medical insights and improve prevention care.

(ex: AI, Machine Learning)

Data Sources

Apple Watch / Fitbit Data

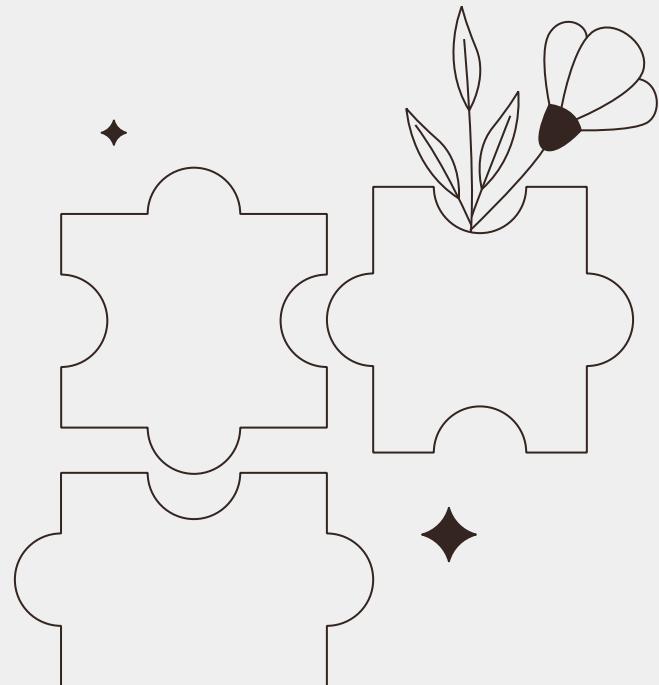
20 features and 6264 instances used
for predicting chronic disease

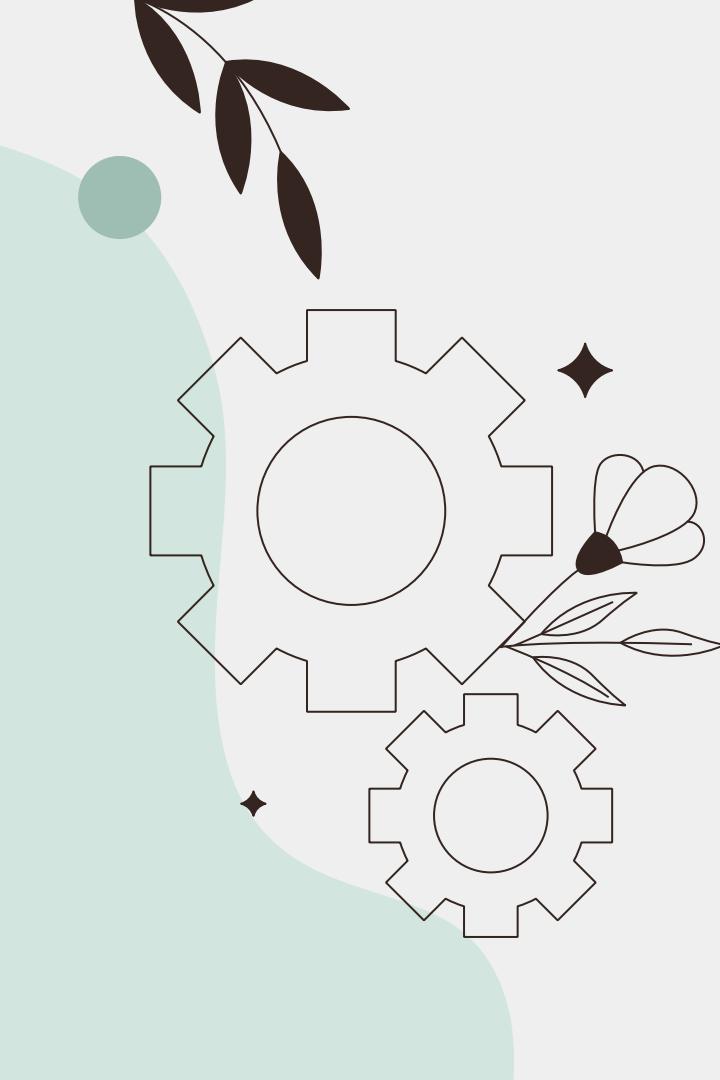
US Chronic Disease Indicators

34 public surveillance indicators and
309215 instances for chronic diseases

Behavioral Risk Factors

33 public surveillance indicators and
106260 instances for behavioral risk
factors



A decorative illustration in the top left corner features three interlocking white gears of varying sizes. A small black flower with five petals and green leaves is growing from the top gear. Two dark brown leaves with veins are positioned above the top gear. Two small dark brown stars are scattered near the bottom gear.

Process and Results

EDA

Feature engineering
and cleaning

Technique

Random Forest
Classifier and
one-hot-encoding

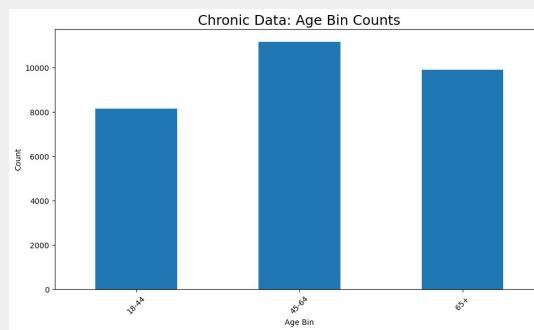
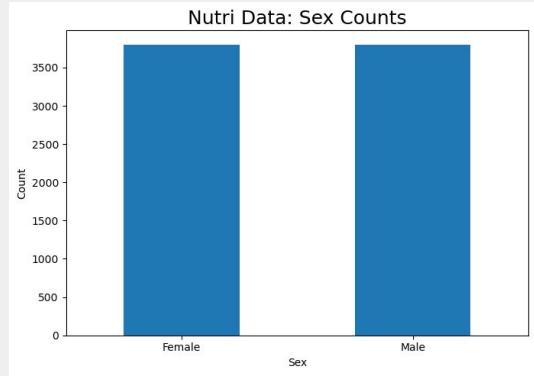
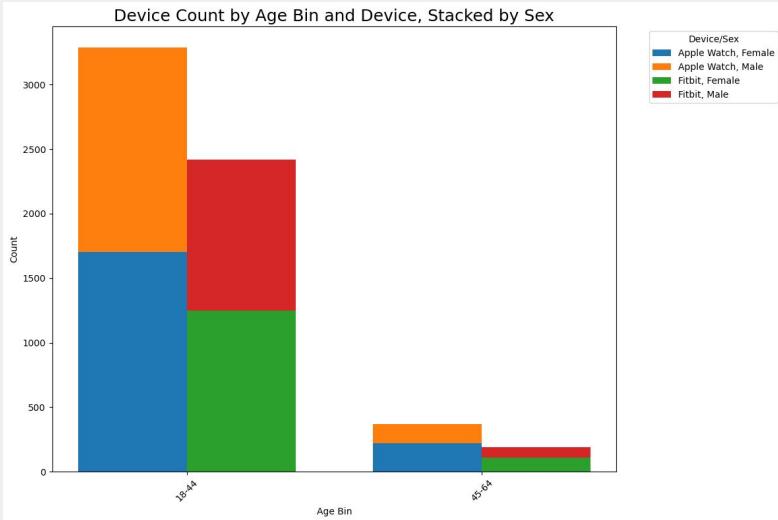
Results

ML Algorithm bias
identified through
visualizations

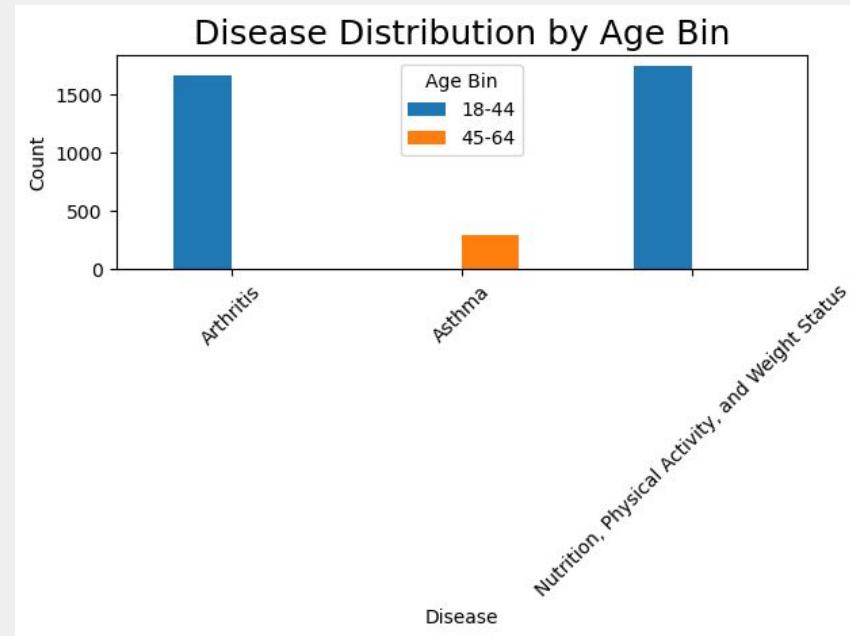
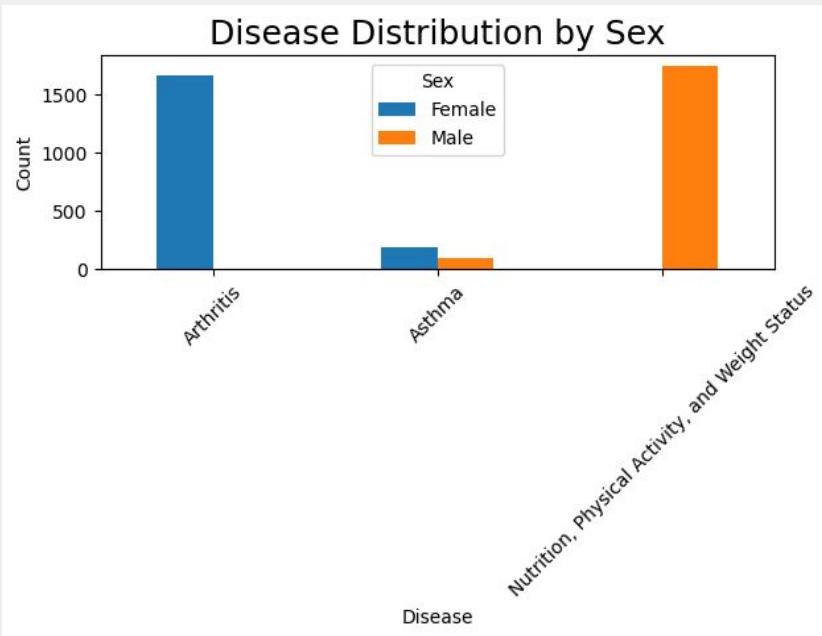
Challenges

Difficulties and where
improvements can be
made

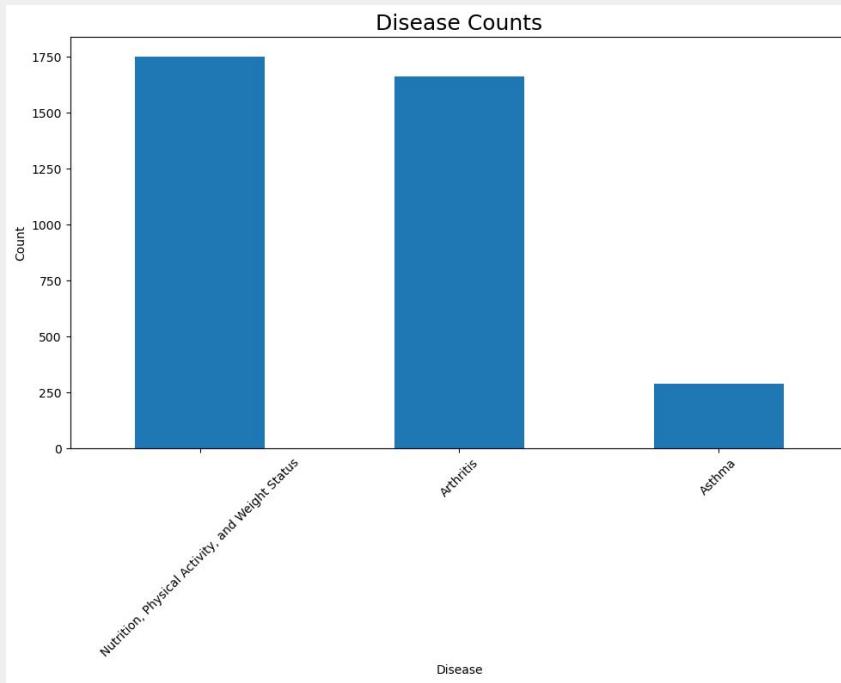
Process: EDA



Results: Visualization 1 and 2



Results: Visualization 3



Challenges and Improvements



Data Availability

Not much overlap, lots of assumptions made



Features

Additional features, better engineering

ML Exploration

Test, explore, compare other algorithms



Validation

Cross-validating with similar data/projects



Thank You!