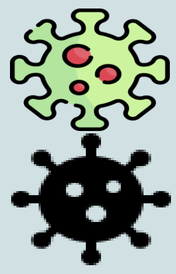
# Comorbidity and Genetic Factors and their Impacts on Patients with COVID-19

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## Overview

Our project consists of data analytics through web portals that visualizes COVID-19 data as well as data science algorithms to learn more about the susceptibility of patients with comorbidities and certain genetic factors by ranking those that are most capable of impacting patients with COVID-19.

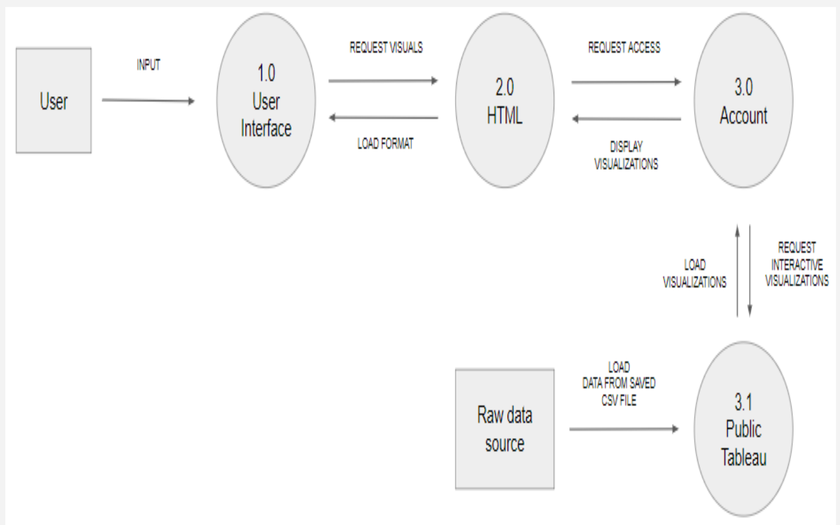


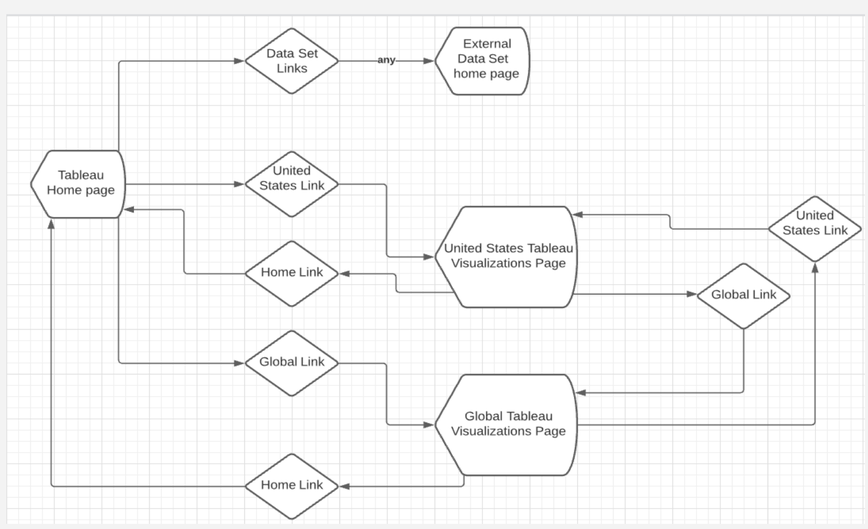
## Background

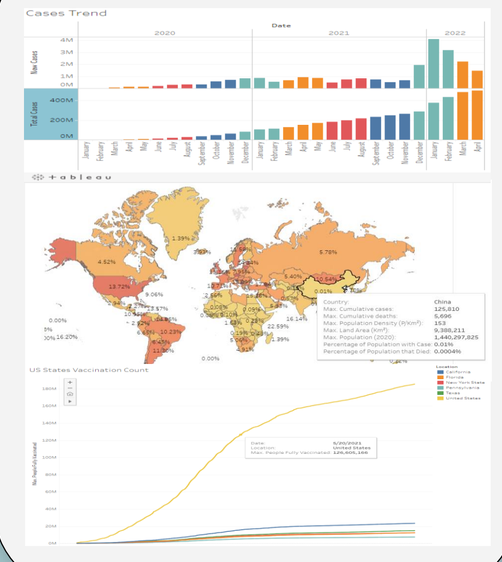
All visuals and calculations utilized for COVID-19 research were gathered from public sources, the visualization portals are web-based dashboards where users can view data concerning the pandemic on a national and global scale, and the data science algorithms run operations on our datasets this information can be used to make predictions on patient outcomes.

## Tableau Portal

- Loaded from the Public Tableaus database
- Each visualization is loaded from the uploader's personal Public Tableau account and displayed to the user from our website

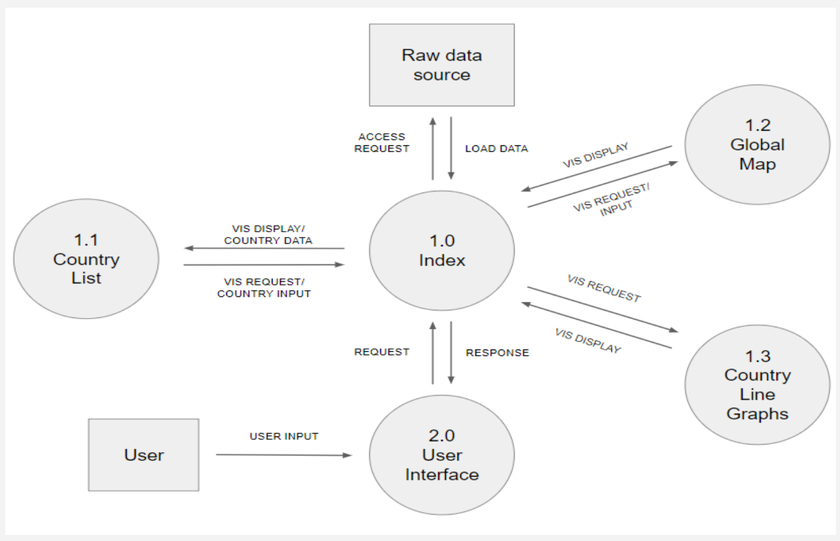


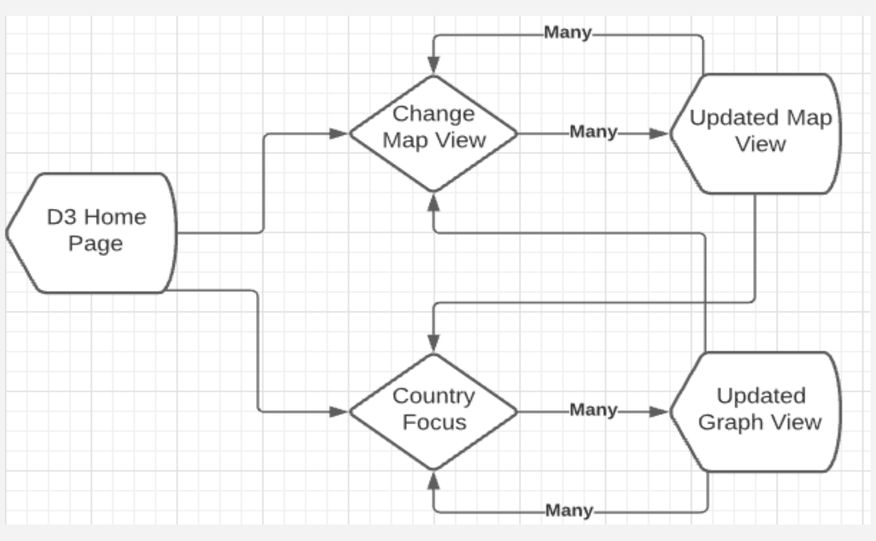



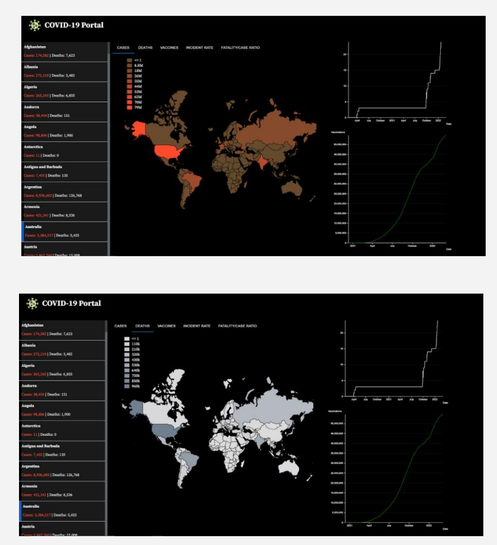




## D3 Portal

- Utilizes API requests to multiple online data sources to gather all the data needed for visualizations
- Uses REACT with HTML\CSS to provide a readable layout



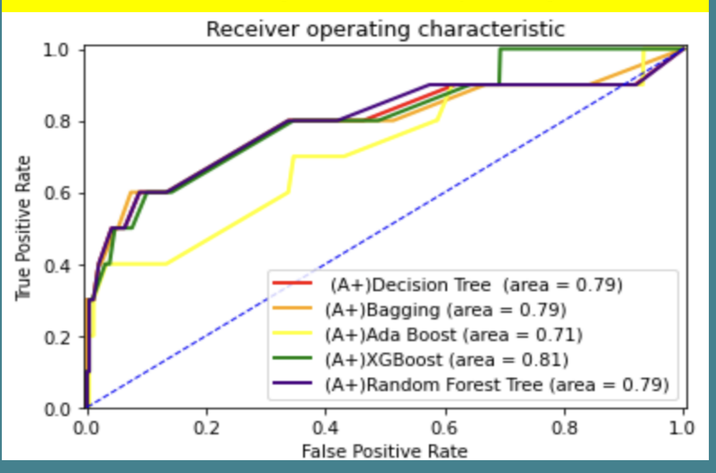



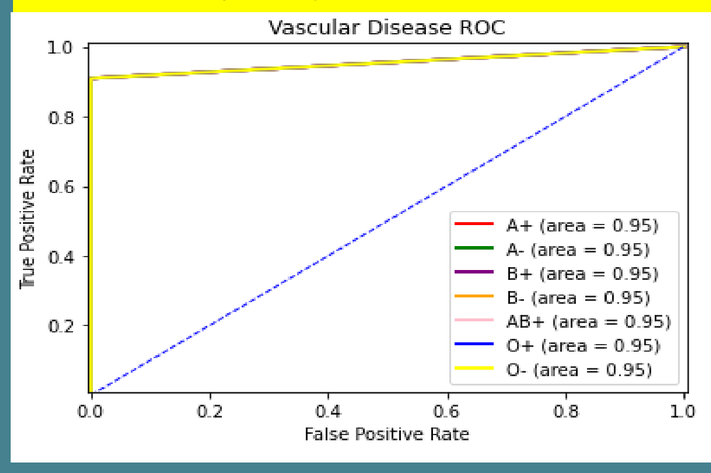

## Machine Learning

- Coded in Python notebook with some open-source libraries such as NumPy, pandas, and scikit-learn
- To visualize the accuracy of our predictions we used ROC curves with different comorbidities and the outcome for testing was death from COVID-19

**Different classifiers being tested on our University of Reading Dataset**




**Vascular Disease predictions gathered from our Swedish Vodafone Dataset**




**A ranking of some of the symptoms and comorbidities found in our Spanish Vodafone dataset**

| Rank | Symptoms | Comorbidities |
|---|---|---|
| 1 | General Malaise | Syphilis |
| 2 | Fatigue | Tuberculosis |
| 3 | Dysgeusia | Chronic Obstructive Pulmonary Disease |
| 4 | Sore Throat | Depression |
| 5 | Sputum Production | Dyslipidemia |