*Michigan Data Set*

Data for the Michigan model is derived from three data sources: 1. Emergency Department visits and visit characteristics from local administrative data 2. Biomarker, laboratory values and vital sign measures from the EMR and 3. Outcomes and comorbidities are obtained via trained chart abstraction. Covid-19 cases are identified as individuals with possible covid suspected at ED triage that is subsequently confirmed by PCR. Our current dataset includes complete data on 412 patients (patients that presented to the ED prior to April 14th with outcome data updated through April 21st). We anticipate a substantial increase in overall available cases prior to the time of final analysis, although the magnitude of the increase in the patient population is difficult to predict.

*Outcomes*

Our current primary outcome is a composite of death, need for intubation and requirement of pressors. Our current secondary outcome is whether a patient was admitted to the ICU from the emergency department. Currently, 61 patients have primary outcome events, 19 of which are death.

*Predictors*

Currently available predictors include age, sex, SOFA score, biomarkers (CRP, LDH, lymphocyte count, d-dimer, high-sensitivity troponin, ferritin, lactate, hemoglobin and albumin), SOFA score, heart rate, respiratory rate (other vital signs incorporated via SOFA) and comorbidities. As laboratory values are not available for all patients, imputation using all available predictors (and indicators of missingness for all available predictors) is used.

*Michigan Model*

Our primary analytic goal was to obtain a model that could make reasonable predictions calibrated to our patient population when sparse data was available. As such, our primary analysis is a Bayesian parametric time-to-event analysis incorporating prior information on predictors from the published literature. All covariates are included in the model. To minimize overfitting, pessimistic priors (mean coefficient value 0, SD 0.005) are applied to predictors without available prior information. The current model is available as a web app: https://ed-covid.herokuapp.com