THE NEED FOR GREATER RESOLUTION IN COVID-19 FORECASTING

The COVID-19 pandemic has flooded decision-makers with data, statistics, models, forecasts, and graphs, but almost no actionable information. The vast majority of existing COVID-19 forecasting models project cases or deaths down to the state level. However, given the vast differences in populations within each state—including their susceptibility to the disease, likelihood to transmit it, and vulnerability factors impacting the disease's localized severity—statewide predictions are simply not as useful for someone deciding when their county, facility, or college campus is projected to be low risk.

BOOZ ALLEN’S COVID-19 SAFE RETURN SIMULATOR

Booz Allen’s COVID-19 Safe Return Simulator models the spread of coronavirus down to hyperlocal levels that are useful for decision-makers. The result of thousands of simulations is a simple, projected, actionable Low-Risk Date that local decision makers can use in their proactive planning and risk mitigation. The Low-Risk Date for each location can be updated daily based on publicly-available health information, as well as proprietary telemetric data that anonymously measures the changes in movements and social distancing of individuals.

As of August 21, 2020, the COVID-19 Safe Return Simulator is available for the states highlighted above.

UNIQUE BENEFITS OF THE COVID-19 SAFE RETURN SIMULATOR

**Decision-Making Confidence:** Ability to determine, using advanced analytics and simulation methodologies, when communities, facilities, or installations are projected to be low risk

**Continuous Monitoring:** Ability to incorporate telemetric data, combined with rigorous analysis of virus exposure in the surrounding areas, ensures that you are continuously informed if your community’s projected Low-Risk date changes

**Scenario Planning:** Simulation tool that allows you to “game out” different potential re-opening options (e.g., social distancing, opening for only certain age brackets or population segments) and create what-if scenarios to determine their likely impacts on the projected Low-Risk dates

**Localized Information:** County-level projections aren’t just a “subset” of statewide projects, but instead incorporate community-based data attributes (gender, age, ethnicity, chronic conditions, and other social determinants of health) to make smarter decisions based on more granular forecasting

**Identifying under-represented groups:** Ability to extract insights into traditionally under-represented groups, exposing disparities in health reporting information

**Scalable data platform:** The “virtual lab” enables the easy integration of new data to continuously improve model accuracy and address the needs of specific communities
HOW THE COVID-19 SAFE RETURN SIMULATOR WORKS

The COVID-19 Safe Return Simulator is a multi-method simulation. The model integrates publicly available data from the Centers for Disease Control and Prevention’s (CDC) Behavioral Risk Factor Surveillance System (BRFSS) Selected Metropolitan/Micropolitan Area Risk Trends (SMART) data with the Census Bureau’s American Community Survey (ACS) results to produce county-level forecasts of COVID-19 prevalence and impact considering the number of cohort-specific chronic conditions within each population. Using a probabilistic platform, the model runs thousands of simulations to calibrate certain model parameters using location-specific observed cases of illness and death as prediction targets.

The COVID-19 Safe Return Simulator provides higher resolution forecasts with increased sensitivity to risks within and across geographic and demographic subgroups. These forecasts can serve as a virtual laboratory for decision makers to:

- Identify “hot spots” of potential areas (e.g., U.S. counties) with highest levels of infected individuals within the United States that can act as infection hubs during the ongoing pandemic
- Examine population-specific characteristics (e.g., gender, age, ethnicity, chronic conditions) that can result in disproportionate distribution of mortality and morbidity cases across the United States
- Evaluate the effectiveness of candidate mitigation options (e.g., social distancing, wide-spread testing) aimed at reducing the likelihood disease transmission within different communities

APPLICATIONS FOR COVID-19 AND BEYOND

The COVID-19 Safe Return Simulator provides situational awareness for decision makers to forecast disease progression and test potential impacts of response and recovery strategies. The model can be further enhanced with real-time data such as population movements between counties and states, social media data representing public sentiment regarding compliance to lock down and containment measures, hospitalization information, testing and contact tracing capacity, and personal protective equipment (PPE) availability in support of an evidence-based strategy for returning to normalized operations and mitigating future waves of COVID-19 and other infectious diseases.

ABOUT BOOZ ALLEN

Booz Allen Hamilton is a leading provider of advanced analytics for commercial and government organizations. We have 4,000+ analytics practitioners with expertise in applied mathematics, data science, machine learning, and artificial intelligence. Our health analytics approach is derived from a set of best practices developed over the course of 300+ analytics engagements, combined with our epidemiological expertise and mission understanding of civilian and defense agencies. We are actively supporting the nation’s COVID-19 response through our work with the U.S. Department of Health and Human Services, Defense Health Agency, and Veterans Health Administration.

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