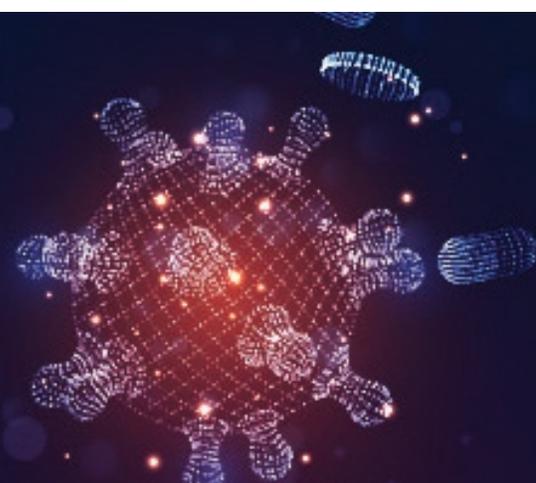


## Coronavirus COVID-19 AI-Based Modeling



### IEM's Experience

IEM's public health and pandemic data and modeling expertise is world class. Our pandemic and medical countermeasures (MCM) modeling work remains the basis for federal government policies and plans that are still in use today. Our team works every day to enable data-driven planning at all levels of government and in the private sector. We help public health agencies and healthcare organizations overcome the challenges they face preparing for and responding to emergencies and disasters.

### IEM's Coronavirus Support for HHS

For over 15 years, IEM has supported the U.S. Department of Health and Human Services (HHS) in their planning and modeling for public health emergencies and MCM requirements, including various federal interagency working groups to develop vetted disease models for all Category A and some Category B biological agents. Our modeling work transformed planning for national and regional medical countermeasures. IEM professionals have first-hand public health and medical services knowledge and expertise. Our staff of experts includes medical preparedness and response planners, epidemiologists, disease progression modelers, former hospital emergency managers, and public health policy leaders. They are experienced clinicians in the areas of public health, emergency care, critical care, medical-surgical, hospital administration, and emergency medical services. IEM supported HHS and their Exercise, Evaluation and After-Action Division to develop a Coronavirus Disease (COVID-19) tabletop exercise (TTX) series intended for senior Federal decision makers during the early stages of the pandemic.

### IEM Modeling Impacts on United States: AI-Based, Short-Term COVID-19 Projections

In light of the recent spike of U.S. COVID-19 cases through community spread, IEM stands ready to assist with COVID-19 modeling to support public health and emergency management planning and response efforts. Using state-of-the-art tools and technologies, we have built credible artificial intelligence (AI) models and projections to drive planning and response.

IEM is currently using an AI model to fit data from various sources and project new cases of COVID-19. We do not assume the average number of secondary infections (R-value) stays the same over time. IEM's AI model finds the best R-value to evaluate how it changes over the course of the outbreak. The IEM modeling team is running ~4 million simulations to fit each state's data and using the best fit for the R-value to project new cases over the next 7 days. The AI models are executed on a daily basis to evaluate the changing dynamics of the COVID-19 pandemic to support nearly 400 counties in all 50 states, the District of Columbia, three U.S. territories, and several regional Councils of Governments. Our AI projections are typically within 10%, and are often within 5%, of actual confirmed cases.

### QUICK FACTS

**Founded**  
1985

**Headquarters**  
Research Triangle Park, NC with ten additional offices around the nation.

**Our Experts**  
The IEM team includes emergency management, homeland security, disaster recovery, and public health professionals, former senior-level FEMA, HUD, DoD, state and local officials, and a large cadre of technical and subject matter experts.

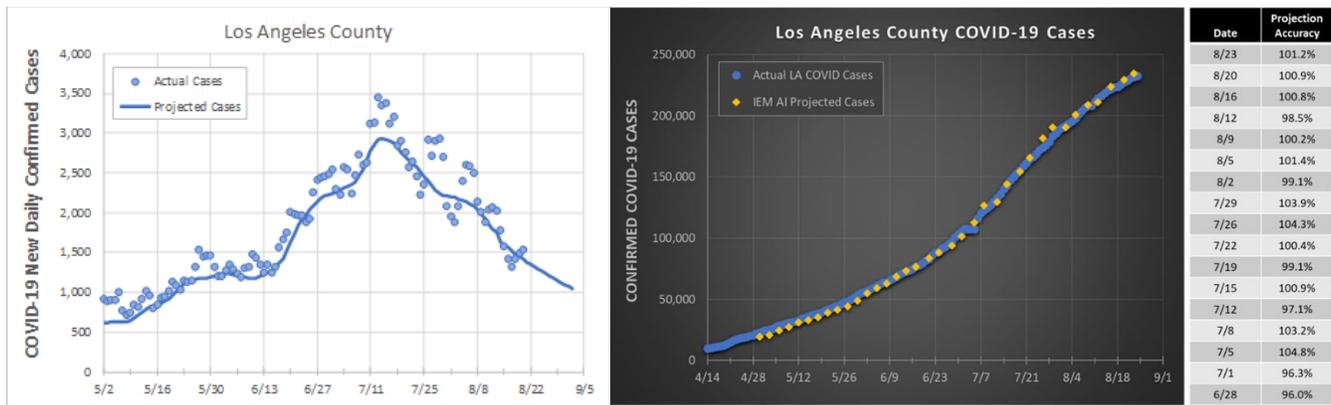
#### Key Service Areas

- Homeland Security and Emergency Management
- Defense and National Security
- Public Health
- Information Technology
- Disaster Recovery

**COVID-19 Visualization Dashboard:**  
<https://iem-modeling.com/>

**COVID-19 State Projections:**  
<https://iem.com/what-we-do/iems-coronavirus-resources/covid-19-state-projections/>

**To get started with your COVID-19 modeling and planning, contact:**  
**BRYAN KOON**  
[covid19response@iem.com](mailto:covid19response@iem.com)  
(850) 519-7966



Leveraging over 15 years of support to HHS for medical consequence modeling and our proprietary AI models, IEM believes that our model outputs can be used to assist localities and their medical facilities to better prepare for an increase in hospitalizations, to better plan for and locate drive-through testing facilities and locate points of distribution, and to determine where increased levels of transmission may be occurring.

Working closely with public health officials and emergency managers, since late March, IEM has been providing the 7-day projections for confirmed COVID-19 cases as well as projections for COVID-19 cases in the hospitals and in intensive care units (ICUs). IEM continues to work to improve our COVID-19 AI model and collaborate with decision makers.

**Previous HHS Project Highlight**

*Crimson Contagion:* IEM provided exercise last summer leading up to and during the HHS full-scale exercise called “Crimson Contagion” (a pandemic influenza scenario). Crimson Contagion was conducted August 13-16, 2019, and was the largest functional exercise ever conducted by HHS covering all ten HHS and FEMA regions, 12 states, and all four time zones in the continental United States. This exercise focused on a whole community response and policy issues of workforce viability; critical infrastructure protection; economic impact; non-pharmaceutical interventions; scarce resource allocation; prioritization of vaccines and other countermeasures; and medical surge operations. Leading up to Crimson Contagion, IEM worked with the states participating in the exercise to provide them with the epidemiological data they would need for the exercise. During the exercise, IEM provided states with their expected state-specific medical case-load on a daily basis. Some states requested a high number of minimum cases (1,000-2,000+) so that the state and local epidemiology teams could work on their contact-tracing procedures. Many states commended IEM’s support leading up to the exercise and stated that they could not have met their exercise goals and objectives without IEM’s assistance.

**IEM Lead**

Dr. Prasith “Sid” Baccam is a **Computational Epidemiologist expert** at IEM with **more than 20 years of experience in medical consequence modeling and simulation of disease outbreaks** and medical consequences following hypothetical attacks with biological agents or emerging infectious diseases. He develops key simulation models and decision support tools at IEM, specializing in public health, disaster response, and medical countermeasures (MCM) to enhance data-driven decision making and improve modeling assumptions.

Upon receiving his **Ph.D. in Applied Mathematics and Immunobiology** at Iowa State University, Dr. Baccam worked as a Postdoctoral Research Associate at Los Alamos National Laboratory where he focused on researching viral and immunological modeling. After his stint at Los Alamos, Dr. Baccam has served as Task Lead in multiple public health projects have allowed him to develop expertise as a mathematical biologist and a leader on high-performance modeling and simulation teams.

He has worked with state and local public health officials as well as Federal agencies, including **HHS**, the Centers for Disease Control and Prevention (**CDC**), and the Department of Homeland Security (**DHS**). Dr. Baccam has published numerous papers on public health response models and implications on policy and has been invited to participate in workshops and symposiums held by the Institute of Medicine (now the National Academy of Health). His modeling results have been briefed to the **Executive Office of the President** and informed two presidential policy actions. His contributions to the public health field and COVID-19 were recently recognized in a [TIME Magazine](#) article.