



# Bridge the knowledge-to-action gap to fight the next outbreak now

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COVID-19 is not the first global pandemic and it certainly won't be the last. As the light at the end of the tunnel of this pandemic is in sight, now is the time to take stock in what we've learned over the last 12 months – namely, that effective response depends on timely integration of expertise and data across academia, industry, and government. As a national laboratory, we have participated in the establishment of dynamic R&D-to-operations teams that support this integration. The goal is to steward these capabilities to enable an efficient and effective response to the next event.

This unifying goal is the focus of the recently released COVID-19 strategy, which focuses on developing centers such as the National Center for Epidemic Forecasting and Outbreak Analytics. To support these efforts, the community must bridge the gap between the operational entities that deploy resources and the supporting science and research entities that innovate. The pandemic offers a case study for events of national significance where operational response must incorporate leading-edge scientific information.

For any disease outbreak, there are two well-understood sides of the response. The first is research and development, which looks closely at the disease to determine its origins, how it spreads, effective pharmaceutical and non-pharmaceutical interventions, etc. The second is operational, which includes determining and communicating decisions, distributing test kits, personal protective equipment, and vaccines, etc. But there is an important part of the scientific response between these two pieces that is often overlooked: evaluation and translation to actionable knowledge and market-ready products.

Many groups independently rallied around the COVID-19 response effort to answer these urgent needs. Universities and industry intensified collaborations for vaccine research. The fashion world turned warehouses into mask-production sites. The automotive industry retooled sites to make face shields. And the Department of Energy put the technical power of the national laboratories to work as an integrated National Virtual Biotechnology Laboratory through funding from the CARES Act to impact manufacturing, epidemiological planning, testing, and molecular therapeutic R&D.

At Los Alamos National Laboratory, when COVID-19 broke out, we were called on to answer difficult science questions: from the efficacy of different testing methods, to how aerosols are dispersed in different environments, to forecasting the spread of the virus. As a Department of Energy national security laboratory with expertise in bioassay, fluid dynamics, and agent-based computer modeling, we were able to quickly pivot our focus to answer those questions. We have also answered questions about how to best store and transport testing kits, how the variants mutate, how different mitigation strategies impact school reopenings, and how to prioritize certain populations for vaccination to maximize the benefits. We continue to answer these questions and others.

Read the rest of the story as it appeared in [Homeland Security Today.US](#).

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