DR. JAMES BENNEYAN has developed a modeling tool, in partnership with the Lahey Hospital and Medical Center, to help hospitals produce their own projections and consider possible shortage scenarios up to 30 days in advance, as they prepare for potential waves of patients that could strain their facilities. Hospitals can run the tool with data specific to their facilities to project when the demand for hospital equipment is going to exceed the supply. It can also model the availability of hospital staff. This tool has been used by approximately 3,000 healthcare systems so far to date.

DR. JACQUELINE GRIFFIN has multiple projects focused on the response to COVID-19. First, in partnership with Massachusetts General Hospital, she is developing data-driven strategies to mitigate the effects of short-term drug shortages, while also researching strategies to increase long-term resiliency in the pharmaceutical supply chain. This work is in collaboration with OrbitalRx, the first software specifically designed to assist pharmacy managers with managing drug shortages.

Second, Dr. Griffin is researching new strategies for blood management in extreme shortage situations, as is currently occurring. Unlike other work in this area, her models integrate the consideration of blood type compatibility for assigning available blood units.

Third, Dr. Griffin is analyzing how to manage limited bed capacity in hospitals and how different policies and protocols will impact health center operations and the patient safety/outcomes. She is proposing to build on her existing collaboration with local health systems and expand on the library of simulation models of outpatient facilities that she has created to develop a tool that can be deployed in assisting in identifying appropriate policies.

Finally, Dr. Griffin is investigating with colleagues how “crisis technologies” (software designed to support the public during emergencies) can better support vulnerable popu-
Dr. Ergun has been asked by the Massachusetts Health Emergency Response Team to provide logistical planning to determine the location and support needs of 1,000 emergency hospital beds currently occurring.

Dr. Wei Xie is developing an interpretable artificial intelligence and risk-based process analytics and decision support platform that addresses critical needs in end-to-end biomanufacturing development and automation, especially monoclonal antibodies (including the bio-drugs for COVID-19). This platform can speed up the time to market and reduce the drug shortage.

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