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IIT-D designs simulation tool for planning operational response during health crisis

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Researchers formulated a pandemic response strategy in collaboration with AIIMS New Delhi and the University of Exeter, United Kingdom (UK)



The SARS-CoV-2 (COVID-19) pandemic has resulted in severely stressed healthcare systems across the world, and in many countries, the capacity of existing infrastructure has proven to be inadequate for managing the COVID-19 caseload.

In this context, there is a need for analytical tools capable of providing quantitative assessments of the extent to which the existing healthcare infrastructure, which is often composed of multiple tiers, in a given region can respond adequately to pandemic caseloads. This is important for planning the capacity of makeshift COVID-19 care facilities.

Such a tool must also be able to handle the substantial uncertainty associated with these situations, including the uncertainty around the care provision process, the caseload, patient progression, and patient flow across the network.

A team of researchers at the Indian Institute of Technology Delhi (IIT-D); All India Institute of Medical Sciences (AIIMS); University of Exeter Business School (UK) have developed a probabilistic discrete-event simulation of the operations of a public healthcare network in a north Indian district and demonstrated its use for planning the capacity of the network for a single wave of the COVID-19 pandemic.

Overall, while the simulation tool was demonstrated using COVID-19 as a case study, it can be used to plan the operational response of the public health network in a given region to any health crisis, such as a dengue or cholera outbreak. It can even be used to evaluate changes in operational policy during routine care conditions, such as when a new referral policy from lower-tier to higher-tier facilities is introduced.