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Suppression of COVID-19 spread is possible, suggests new model

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Suppression of the spread of COVID-19 is an attainable goal, and it can be done through strategies that ease social distancing guidelines, suggests a new model developed by researchers at Washington University in St.

Louis and the Brookings Institution.

"Suppression means not just 'flattening the curve' by spreading out infections over time, but ongoing containment that prevents sustained spread and a large number of new cases," said Ross Hammond, the Betty Bofinger Brown Associate Professor at the Brown School and collaborator on the TRACE (Testing Responses through Agent-based Computational Epidemiology) model. TRACE is a sophisticated computational simulation to inform policy responses to the COVID-19 pandemic in the United States.

"Our analysis based on the TRACE model identifies promising intervention strategies to successfully suppress the spread of COVID-19 while allowing relaxation of many or all of the mass social distancing measures that have been in place across the country," said Hammond, who is also a senior fellow in economic studies at the Brookings Institution.

"As states are reopening, many approaches involve widespread testing, coupled with contact tracing and selective quarantine," Hammond added. "Yet key questions in designing such policies remain difficult to answer. How much testing capacity is really needed? How important is accuracy? How much capacity to trace contacts is needed? What is the most efficient way to use limited testing capacity? How might success depend on still-uncertain assumptions about the spread of the disease itself? What social distancing measures might still be needed to enhance containment?

"Getting the answers 'right' may be the difference between success or failure in containing COVID-19. The TRACE model was designed for this purpose."

TRACE is not a forecasting model, Hammond pointed out.

It is intended instead as a policy laboratory to assist in the design of effective containment policies using testing and contact tracing, he said.

"By considering a very wide array of possible policy variations, capturing scenarios that encompass the extensive uncertainty still surrounding COVID-19, and providing specific quantitative inputs and outcomes, TRACE aims to be a practical tool to help decision-makers manage many of the implementation decisions they face in crafting a reopening strategy," he said. "TRACE is an agent-based computational model, allowing it to include variations in age, activity pattern, infectivity and contact networks—all features that evidence so far suggests are important determinants of how COVID-19 spreads."

One key strategy still includes limited social distancing.

However, Hammond said, the model shows that quarantining and self-isolation remain critical components that must stay uniformly consistent—possibly through strategies to entice and support such habits.

"All of the policies we simulated underscore the importance of sufficient adherence by individual citizens to quarantine, self-isolation or limited social distancing measures," Hammond said. "This indicates that an important goal for policy may be to encourage adherence through consistent, widespread messaging and to make self-isolation financially and logistically feasible.

"The goal of reopening large parts of the country while suppressing COVID-19 and preventing a large second wave of infection may well be possible and not that far out of reach from our current capabilities," he said. "But to do this, we will likely need to refocus and re-orient our current approach to make best use of limited resources, and we will need to tailor features of any specific policy implementation to local conditions to maximize chances of success.

"TRACE was designed to help facilitate this process, and we hope it will prove a valuable resource for decision-makers working to bring our country through this crisis."

Provided by Washington University in St. Louis

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