

How to Now

> LIFE AFTER 2020



HEAL TOGETHER

The pandemic is not a game, but game theory can help

As our world continues to reel from the pandemic, there is a resulting shortage of medical supplies. And with coronavirus cases persisting and businesses continuing to reopen, intense worldwide competition for testing kits and PPE is not going away anytime soon. However, a theoretical framework called game theory—the study of strategies in a competitive setting—can help.

Scholars in disciplines from math to business to political science use game theory to understand how people are likely to make decisions in response to actions by others. To capture the intense competition among health care organizations for limited medical supplies and to look for solutions, our research group constructed a computer-based supply chain network game theory model.

The model weighs many complex factors including the prices of the medical items charged by different suppliers, the transportation costs to points of demand, and even risk. It also includes penalties associated with shortages or surpluses, and enables a multiplicity of scenarios.

This research yields insights to help organizations more effectively and economically procure critical medical supplies under demand unpredictability and competition. And the findings from our model confirm that, in the case of the coronavirus, more supply points are required in order to ensure that organizations have the critical supplies they need. One solution to the supply shortage is for governments to invest in domestic production facilities rather than importing and offshoring so much. Luckily, we are now starting to see more countries doing what our model proposes: setting up local production sites for supplies.

The pandemic will be with us until a vaccine and lifesaving medical treatments are widely available. We must also be prepared for future pandemics. And game theory will remain a powerful tool to identify ways that our nation and the world can more effectively prepare for and mitigate health care disasters.

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