

How long will the COVID-19 quarantine last? Business research provides insight

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Amid the historic Covid-19 pandemic, questions about everything from medical supplies to the economy abound. But one question is uppermost in people's minds: How long will stay-at-home restrictions need to

continue in order to stop the disease's spread?

New research from USC Marshall suggests three to more than six weeks, depending on degree of control sought.

Gerard Tellis, Neely Chair of American Enterprise, director of the Institute for Outlier Research in Business (iORB) and the Center of Global Innovation, and research partner Ashish Sood of UC Riverside, along with Nitish Sood, a cellular and molecular biology student at Augusta University, have released a paper that parses the possibilities.

The study looks at 36 countries and all 50 U.S. states, and finds that the aggressive intervention to contain the [coronavirus](#) must be maintained for at least 44 days. They are extending the research to all countries and U.S. states.

"We are now estimating counterfactuals," said Tellis. "How many would have been spared infections had the U.S. acted earlier?"

Two Metrics

The study's authors identified two simple and generalizable metrics of the spread of disease: daily growth rate and time to double cumulative cases.

Daily growth rate is the percentage increase in cumulative cases. Time to double (doubling time) is the number of days for cumulative cases to double at the current growth rate.

"Counts of total or new cases can be misleading and difficult to compare across countries," Tellis said. "Growth rate and time to double are critical metrics for an accurate understanding of how this disease is spreading."

Given these two metrics, the researchers defined three measurable benchmarks for analysts and public health managers to target.

- Moderation: when growth rate stays below 10% and doubling time stays above seven days.
- Control: when growth rate stays below 1% and doubling time stays above 70 days
- Containment: when growth rate remains 0.1% and doubling time stays above 700 days.

"These simple, intuitive and universal benchmarks give public health officials clear goals to target in managing this pandemic," said Sood, an associate professor of Marketing at UC Riverside's A. Gary Anderson Graduate School of Management.

Early results using this model to analyze the data suggest that once aggressive interventions are in place, large countries take almost three weeks to see moderation, one month to get control, and 45 days to achieve containment.

Less aggressive interventions yield poorer results and a longer timeline before achieving containment. The authors note that larger countries take longer to see moderation.

The authors of the study defined aggressive interventions as lockdowns, stay-at-home mandates, mass testing, and quarantines.

"Even though huge differences exist among countries, it's striking to see how many similarities from aggressive intervention to moderation, control and containment of the spread of the disease," professor Sood said.

Tellis noted: "Besides size of country, borders, cultural greetings

(bowing versus handshaking or kissing) temperature, humidity and latitude may explain differences in outcome."

The researchers say their analysis bolsters the case for adopting aggressive measures, whether it's the Chinese model of aggressive lockdown with widespread testing, mass testing and quarantine as in South Korea or Singapore, or the voluntary stay-at-home policies with scant testing of states like California and New York.

Tellis offers caution. "The U.S. faces a unique challenge," he said. "All states have still not ordered lockdowns. So states that have and contain the disease may suffer contagion and relapse from those that don't or were late to do so. A uniform federal policy seems imperative."

Provided by University of Southern California

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