

## Shutdowns prevented 60 million coronavirus infections in the U.S., study finds

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Shutdown orders prevented about 60 million novel [coronavirus](#) infections in the United States and 285 million in China, according to a [research study](#) published Monday that examined how stay-at-home orders and other restrictions limited the spread of the contagion.

A separate [study](#) from epidemiologists at Imperial College London estimated the shutdowns saved about 3.1 million lives in 11 European countries, including 500,000 in the United Kingdom, and dropped infection rates by an average of 82 percent, sufficient to drive the contagion well below epidemic levels.

The two reports, published simultaneously Monday in the journal *Nature*, used completely different methods to reach similar conclusions. They suggest that the aggressive and unprecedented shutdowns, which caused massive economic disruptions and job losses, were effective at halting the exponential spread of the novel coronavirus.

“Without these policies employed, we would have lived through a very different April and May,” said Solomon Hsiang, director of the Global Policy Laboratory at the University of California at Berkeley, and the leader of the research team that surveyed how six countries — China, the United States, France, Italy, Iran and South Korea — responded to the pandemic.

His team estimated that, in the initial days after the virus was seeded in each country, and before the shutdowns, the number of infections was doubling every two days.

“The disease was spreading at a really extraordinary rate that is rare even among very infectious diseases,” he said in an interview. The global response to covid-19, the disease caused by the virus, resulted in “saving more lives in a shorter period of time than ever before,” he said in a separate conference call with reporters.

The two reports on the effectiveness of the shutdowns come with a clear warning that the pandemic, even if in retreat in some of the places hardest hit, is far from over. The overwhelming majority of people remain susceptible to the virus. Only about 3 percent to 4 percent of people in the countries being studied have been infected to date, said Samir Bhatt, senior author of the Imperial College London study.

“This is just the beginning of the epidemic: we’re very far from herd immunity,” Bhatt said Monday in an email. “The risk of a second wave happening if all interventions and precautions are abandoned is very real.”

The Berkeley study used an “econometric” model to estimate how 1,717 interventions, such as stay-at-home orders, business closings and travel bans, altered the spread of the virus. The researchers looked at infection rates before and after the interventions were imposed. Some of these interventions were local, and some regional or national.

The researchers concluded that the six countries collectively managed to avert 62 million test-confirmed infections. Because most people who are infected never get tested or diagnosed with covid-19, the actual number of cases that were averted is much higher — about 530 million in the six countries, the Berkeley researchers estimated. They estimated that the United States, had it not imposed shutdowns

and other measures, would have seen an additional 4.8 million diagnosed infections and 60 million actual infections.

Timing is crucial, the Berkeley study found. Small delays in implementing shutdowns can lead to “dramatically different health outcomes.” The report, while reviewing what worked and what made little difference, is clearly aimed at the many countries still early in their battle against the coronavirus.

“Societies around the world are weighing whether the health benefits of anti-contagion policies are worth their social and economic costs,” the Berkeley team wrote. The economic costs of shutdowns are highly visible — closed stores, huge job losses, empty streets, food lines. The health benefits of the shutdowns, however, are invisible, because they involve “infections that never occurred and deaths that did not happen,” Hsiang said.

That spurred the researchers to come up with their estimates of infections prevented. The Berkeley team did not produce an estimate of lives saved.

Banning large gatherings had more of an effect in France and South Korea than in the other countries.

One striking finding: School closures did not show a significant effect, although the authors cautioned that their research on this was not conclusive and the effectiveness of school closures requires further study.

The findings could be instructive to states and school districts as they weigh when and how to reopen this fall. There is enormous pressure to resume in-person school — both because virtual education has left many students behind, and because many parents of young children cannot go to work if their children are at home.

But schools worry that children could become infected and then transmit covid-19 to family members, and they are concerned about teachers and other staff who are older or particularly vulnerable.

Many districts are considering a hybrid model, with some children in the building and others learning from home. The goal would be to minimize the numbers on site to provide for social distancing.

Last month, the Centers for Disease Control and Prevention said schools should remain closed while infection rates were high, but offered guidance for reopening as communities recover. [The recommendations included](#) a raft of ideas to create distancing inside schools, most of which were [already under consideration](#) by many districts. Among them: desks at least six feet apart and facing the same direction, lunch in classrooms, leaving every other row on buses empty and staggered arrival times.

The agency also recommended mandatory cloth masks for staff and encouraged use by students, and daily temperature screenings for everyone. It said schools should have adequate supplies for hygiene, including soap, hand sanitizer and no-touch trash cans. Surfaces and school buses should be cleaned and disinfected daily, it said, and windows and doors should be open so air can circulate.

In discussing their findings Monday with reporters in the teleconference, leaders of the two research teams said challenges exist in crafting their models and thus there are uncertainties in the final estimates.

Bhatt, for example, said the model used by his team is highly sensitive to assumptions about the infection fatality rate, estimates for which have varied among researchers and from one country to another. He said his team was heartened to see that its estimates for the number of people infected so far is generally consistent with antibody surveys that attempt to calculate the attack rate of the virus.

Ian Bolliger, one of the Berkeley researchers, acknowledged the difficulty in obtaining reliable numbers for coronavirus infections given the haphazard pattern of testing for the virus. Both research teams said the peer review process had made their findings more robust.

Jennifer Nuzzo, an epidemiologist at the Johns Hopkins Bloomberg School of Public Health’s Center for Health Security, said in an email that these new reports show the effectiveness of shutdowns. But she said the economic and social harms of these efforts are considerable, and so societies at this point need to transition to a more focused strategy built around testing, contact tracing and isolation of covid-19 patients.

Nuzzo, who was not involved in either of the two studies, added that the ultimate impact of the shutdowns depends on what happens next: “The lockdowns were a pause button, not a cure,” she said. “Any reduction in the occurrence of cases or deaths is temporary.”

The two studies estimated the benefits of the shutdowns, but the leaders of the research did not go so far as to offer specific policy prescriptions. In a teleconference with reporters, Bhatt said economic activity could return to some degree so long as some interventions to limit viral spread remain in place: "We're not saying the country needs to stay locked down forever."

Hsiang spoke of the extreme economic hardship the United States and other countries have endured in the struggle to contain the virus.

"The whole point of this study is to help us understand what we got for this tremendous sacrifice that the country has gone through. Ultimately, whether or not it was worth it is something society has to decide," he said.

The early indicators of community spread were akin to seeing cracks form in the ceiling and realizing the roof was about collapse, he said. The shutdowns were painful and exhausting, but "nevertheless everyone caught the roof and held it up before it crashed in on everyone."