Coronavirus Shutdowns: Economists Look for Better Answers

Researchers are developing models for more targeted closings (and reopenings) that would curb the spread of infection at a less severe economic cost.

By Eduardo Porter

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As Covid-19 cases took off in New York in March, Gov. Andrew M. Cuomo imposed a lockdown of nonessential businesses to slow the spread of the coronavirus, calling it “the most drastic action we can take.”

Now researchers say more targeted approaches — in New York and elsewhere — might have protected public health with less economic pain.

Businesses in New York City, where an initial phase of reopening is to begin on Monday, have been mostly shut down for 11 weeks. But a study has found that the economic cost could have been reduced by a third or more by strategically choosing neighborhoods to close, calibrating the risk of infection for local residents and workers with the impact on local jobs.

The ZIP codes most affected by the outbreak are not necessarily the places with the highest concentration of jobs. It would be possible to keep businesses in certain areas open if the chances of spreading the virus there were low, especially if the economic cost of closing them was disproportionately high, the researchers found.
"The blunt instrument of a uniform policy causes more economic and related health harm than is necessary to accomplish the same goal of not increasing infections," said John Birge, a mathematician at the University of Chicago who was an author of the study.

Other researchers are taking on the problem by assessing the relative level of risk posed by different businesses.

"The distinction between essential and nonessential businesses is very arbitrary," said Katherine Baicker, an economist at the University of Chicago involved in some of the research. "In a world where policymakers could be nuanced across type of business, geography and time, the policy response could be much better."

With daily Covid-19 deaths abating in New York and many other parts of the country, and cities and states easing lockdowns, researchers are beginning to assess alternative strategies to manage the spread of the virus. Much of their work involves using data to devise less restrictive containment policies, in the United States and elsewhere.

In Europe, France and Spain have adopted versions of a plan put forth by Bary S.R. Pradelski, an economist at Oxford University, and Miquel Oliu-Barton, a mathematician at the Université Paris-Dauphine, to divide countries into dangerous red and safer green zones, and allow travel within and between the green while strictly curtailing it in the red.
The researchers are pushing for the European Union to reopen the tourism business that is so critical for southern European countries by allowing travel between green areas that have low infection rates, hospital capacity to spare, and effective testing and tracing systems. Governments could focus their resources on the red areas of most economic importance, increasing testing and adding hospital capacity to turn them green.

“The impact of not having any tourism in the summer would bring Greece, Italy and Spain to an economic situation like they experienced in the Great Recession,” Mr. Pradelski said. Spain, for instance, has agreed to open the island of Majorca to tourists from some countries, including Germany and France, while keeping it closed to travel to and from the Spanish mainland.

In the United States, a group of researchers including Ms. Baicker is following a different track: using cellphone data and surveys to identify which businesses are more crowded, as well as how much of their business is conducted indoors, and how much interaction it involves, either person to person or via touching shared surfaces.

Customers tend to linger longer in a Chuck E. Cheese than in a Chick-fil-A, increasing their risk of contagion if somebody nearby is infected. Chick-fil-A, however, receives a lot more customers per square foot, bringing more people in contact with one another. Nail salons involve more personal interaction than lawn and garden stores. Some restaurants are packed at certain times, while others receive a steady trickle throughout the day.

The researchers’ idea is that businesses could retrofit in ways suited to each — say, spacing out tables or limiting foot traffic — while safeguarding health. Moreover, with access to real-time information, consumers could avoid riskier businesses and shop when their preferred stores might be less crowded.

The New York City study also relied on cellphone data. That research, by Mr. Birge and Ozan Candogan of the University of Chicago and Yiding Feng of Northwestern University, is based on the premise that residents of one neighborhood can become infected, or infect others, while at work in another — depending on how long they spend there and the infection rate in both. The risk of spreading the virus by opening a given neighborhood to business also rises with the size of its susceptible population.
“Mobility plays a key role,” Mr. Candogan said. “With smart policies we could reduce the spread of the disease and minimize job losses.” The study identifies the plan that preserves as much employment as possible even as it contains the disease.

“With appropriate targeting,” the scholars wrote, “it is possible to achieve a reduction in infections with up to 33 percent to 42 percent lower economic cost than uniform citywide closure policies.”

New York City is not in absolute control of its destiny. If adjoining areas in Westchester County, Long Island and New Jersey remain open for business, New Yorkers who are infected while at work there will spread the virus in the city when they return home.

But even at the peak of contagion in mid-April, assuming 80 percent of businesses remained open in neighboring counties, judiciously shutting down businesses would have allowed New York City to reduce infection rates in every neighborhood while keeping 40 percent of its economy open, the three researchers found.

The challenge gets easier as the infection rate declines. If New York reaches a point over the summer in which infection has pretty much faded and the task is to prevent the virus from reasserting itself, many more businesses could reopen, according to the researchers.

Source: John R. Birge, Ozan Candogan (University of Chicago) and Yiding Feng (Northwestern University)  •  By Karl Russell

In the first case, during the peak of the outbreak, Wall Street would have had to remain shuttered, as indeed most businesses in Manhattan. But companies in Manhattan’s garment district, where there are lots of jobs but only a small resident population, could have opened for business, as well as those across a large swath of the other boroughs. Their risk of contagion from outsiders coming in to work there was small enough, and the gain from maintaining their jobs large enough, to justify keeping them humming.

When New York manages to sharply reduce infection rates, and the challenge becomes preventing a second wave, the city could keep 87 percent of its economy running even if adjoining counties were operating at 80 percent capacity, the researchers concluded. Jackson Heights and Corona in Queens would have to keep most of their businesses closed, as would some big chunks of Manhattan’s Upper East Side and Kingsbridge Heights in the Bronx. But most neighborhoods could allow business broadly to resume operation.

It’s unclear to what extent these studies could yield useful policy. It might be difficult for Mr. Cuomo or Mayor Bill de Blasio to close down a neighborhood and keep the adjoining ones open. One striking feature arising from this research, in any case, is the extent to which data could help steer decisions.

Both American studies rely on cellphone data reflecting patterns of movement and commerce. Researchers do not have access to information about individual users.

But more data is available. Researchers from Pennsylvania State University, the University of Chicago and the University of California, San Diego, studied what could be done with cellphone tracking data that, instead, detailed the travel history of people who had become infected. That’s what happened in South Korea.

South Korea detected its first case of Covid-19 on Jan. 20, one day before the United States did. By May 26, 295 out of every million Americans had died from the disease, almost 60 times South Korea’s rate. And it contained the disease without a lockdown. The International Monetary Fund expects South Korea’s economy to contract by only 1.2 percent this year, compared with 5.9 percent for the United States.

South Korea started testing people much earlier than the United States, allowing health authorities to track potential routes of contagion and isolate the infected. But the researchers point out that South Korea’s strategy also relied critically on the publication of their travel histories.

South Koreans received text messages whenever new cases were discovered in their neighborhood, as well as information and timelines of infected people’s travel. Though businesses were not shut down, South Koreans knew which Starbucks had served an
infected person, and could stay away from it for a while.

Using cellphone data to track changes in people's commuting around town, the economists estimated that in Seoul alone, public disclosure would reduce the number of cases over two years by 400,000 and the number of deaths by 13,000. And achieving the same death rate using citywide lockdowns such as those done in New York would double the economic cost.

“We are not distinguishing between places where the probability of infection is high and places where the probability is low. We are lowering social interactions across the board,” said Chang-Tai Hsieh of the University of Chicago, a co-author of the study of South Korea's methods. “We can do social-distancing in a much smarter way that’s a lot more targeted, in which we get more benefits and less costs.”

It is unclear whether Americans would tolerate the kind of intrusion into their personal lives that the Korean strategy would entail. But the more information is available, the more precise the strategy can be.

“I don’t think people have thought that deeply about it,” Mr. Hsieh said. “It is something that we as a society have to decide: What’s the trade-off we are willing to live with?”

Eduardo Porter joined The Times in 2004 from The Wall Street Journal. He has reported about economics and other matters from Mexico City, Tokyo, London and São Paulo. @portereduardo

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