***As States Rush to Reopen, Scientists Fear a Coronavirus Comeback***

Officials are under pressure to restart the economy, but many states are moving too quickly, researchers say. The costs may be measured in lost lives.

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Millions of working people and small-business owners who cannot earn money while sheltering at home are facing economic ruin. So dozens of states, seeking to ease the pain, are coming out of lockdown.

Most have not met even minimal criteria for doing so safely, and some are reopening even as [coronavirus](https://www.nytimes.com/2020/05/21/health/wuhan-coronavirus-laboratory.html) cases rise, inviting disaster. The much-feared “second wave” of infection may not wait until fall, many scientists say, and instead may become a storm of wavelets [breaking unpredictably across the country](https://www.nytimes.com/2020/05/08/health/coronavirus-pandemic-curve-scenarios.html).

The reopenings will proceed nonetheless. The question now, [scientists](https://www.nytimes.com/2020/05/21/health/wuhan-coronavirus-laboratory.html) say, is whether the nation can minimize the damage by intelligently adopting new tactics.

[Evidence is mounting](https://www.preprints.org/manuscript/202004.0203/v1) that masks — if worn in public places, by everyone — [are far more effective](https://masks4all.co/) at stopping transmission [than was previously realized](https://medium.com/@tomaspueyo/coronavirus-the-basic-dance-steps-everybody-can-follow-b3d216daa343). Across the nation, testing remains wholly inadequate, but home-use nasal swabs and saliva tests are on the way that may provide a clearer picture of where the virus is.

Americans are lining up for antibody tests that may reveal who has some immunity, perhaps opening paths back to normal life for them. Early (but still controversial) surveys suggest that more Americans may carry antibodies than initially thought.

Employers are moving [to design safer workplaces](https://www.nytimes.com/2020/05/04/health/coronavirus-office-makeover.html). A modestly effective antiviral treatment [has been found](https://www.nytimes.com/2020/05/01/health/coronavirus-remdesivir.html). And laboratories around the world are racing toward the grail — a vaccine — [at an unprecedented pace](https://www.nytimes.com/2020/05/02/us/politics/vaccines-coronavirus-research.html).

But while it may still be possible to blunt the impact of the reopenings, the nation is finding even this goal difficult.

As the weather warms, Americans are already struggling to stay at home or remain six feet apart on crowded beaches, hiking trails and park playgrounds. Every crowd [may have some silent carriers](https://www.nytimes.com/2020/03/31/health/coronavirus-asymptomatic-transmission.html) of the virus.

Outside New York, California and a few other states, many Americans refuse to wear masks, and governors and mayors have waffled over whether to order them to. The dispute has even led to threats and [a killing](https://abcnews.go.com/US/coronavirus-live-updates-tsa-require-employees-wear-facial/story?id=70569418).

Fifty brands of antibody tests are available, but [many are inaccurate](https://www.nytimes.com/2020/04/24/health/coronavirus-antibody-tests.html). Many states are moving too quickly for employers and retailers to make environments safe. And the lockdowns have become entwined in partisan politics, with some libertarian extremists, gun-rights advocates and anti-vaccine activists painting them as an infringement of personal freedoms.

Deaths are already far higher than the [60,000 once predicted by August](https://www.cnn.com/2020/04/07/health/ihme-updated-covid19-model/index.html). Even President Trump has begun to [talk of a toll that may reach 100,000](https://www.nytimes.com/2020/05/03/us/coronavirus-updates.html), perhaps more.

Some [epidemiological models](https://www.nytimes.com/interactive/2020/04/22/upshot/coronavirus-models.html) predict three times that many within months — closer to the 240,000 that the White House’s coronavirus task force [predicted in March](https://www.nytimes.com/2020/03/31/us/politics/coronavirus-death-toll-united-states.html) before [switching to a new, more optimistic model](https://www.vox.com/future-perfect/2020/5/2/21241261/coronavirus-modeling-us-deaths-ihme-pandemic).

Dr. Anthony S. Fauci, the task force’s chief medical adviser, has said he expects cases to spike in closed environments like nursing homes, prisons and factories.

“We’re not reopening based on science,” said Dr. Thomas R. Frieden, a former director of the C.D.C. in the Obama administration. “We’re reopening based on politics, ideology and public pressure. And I think it’s going to end badly.”

**All Quiet, at First**

The effects of the reopenings will not be immediately apparent, and in the absence of widespread testing, it will be hard to know where the country stands in the fight against the virus.

It takes two or three weeks for the newly infected who become severely ill to need hospitalization. An initial calm may encourage more Americans to drop their guard or more governors to ease restrictions.

“I do worry that people will stay home enough in the states that open earliest so that we don’t immediately see the second wave, and then other states will draw the wrong lessons,” said Dr. Leana Wen, a former health commissioner of Baltimore.

Social distancing has proved effective at interrupting viral transmission in places where it was embraced. But now even formerly terrified New Yorkers, living at the center of the nation’s outbreak, are clearly wearying of it.

Central Park, which was [so quiet in late March](https://www.cnbc.com/2020/04/01/photos-of-new-york-city-quieted-by-coronavirus.html) that the birdsong was startlingly loud, [is often crowded](https://news.yahoo.com/central-park-still-crowded-people-192352516.html) with joggers, strollers and cyclists. Avenues that were ghostly canyons now have far more cars, Mayor Bill de Blasiohas complained,and steady traffic has returned to some local highways.

Viruses persist only because they can exploit human interactions: a stray cough, a [plume of virions](https://theconversation.com/how-to-keep-a-coronavirus-safe-distance-when-youre-jogging-or-cycling-136235)[behind a jogger](http://www.urbanphysics.net/Social%20Distancing%20v20_White_Paper.pdf), a bicycle handle [no one has disinfected](https://sph.umich.edu/pursuit/2020posts/smart-cleaning-for-viruses.html).

Nationwide, there are still about 25,000 new confirmed cases a day of Covid-19, the disease caused by the coronavirus. Most are probably within families, experts said, or among health workers and emergency personnel exposed on the job.

But there have also been hot spots of hundreds of cases in [meat and poultry plants](https://www.usnews.com/news/healthiest-communities/articles/2020-05-01/cdc-nearly-5-000-meat-plant-workers-infected-by-coronavirus), [veterans’ hospitals](https://www.militarytimes.com/news/pentagon-congress/2020/04/16/va-coronavirus-cases-jump-11-percent-overnight-approach-5000-nationwide/) and [nursing homes](https://www.newsobserver.com/news/coronavirus/article241996291.html) in rural states.

To keep the toll from rising, some [factories making essential goods](https://www.cbsnews.com/news/ford-rawsonville-plant-michigan-ventilator-factory/), like ventilators, have placed workstations six feet apart and made temperature checks and masks mandatory.

[Food plants](https://www.union-bulletin.com/news/health_fitness/coronavirus/health-officials-require-more-of-tyson-fresh-meats/article_4b424025-2108-5157-ace2-e770dd172cf7.html) are installing plastic barriers between workers and on cafeteria tables, requiring masks, checking symptoms at entrances and doing more cleaning. Most nursing homes no longer accept visitors.

As well intentioned as these stopgap measures may be, they are part of a headlong rush back to “normal life” that few experts condone.

Many models for safely reopening the economy have been issued, including [one from the National Center for Disaster Preparedness](https://ncdp.columbia.edu/custom-content/uploads/2020/04/NCDP_ReopeningAmerica_Phase1.pdf) at Columbia, and others [from Harvard](https://ethics.harvard.edu/files/center-for-ethics/files/roadmaptopandemicresilience_updated_4.20.20.pdf), [CovidActNow](https://covidactnow.org/" \o "" \t "_blank) and [Resolve to Save Lives](https://preventepidemics.org/coronavirus/insights/adaptive-response/).

Most reopening criteria, including the [White House’s relatively vague guidelines](https://www.whitehouse.gov/openingamerica/), say that at a minimum a state should have 14 days of declining cases before it even considers reopening. Almost no state reopening now has met that low standard.

Virtually all guidelines emphasize comprehensive testing and systematic contact tracing.

Testing is a sore point. Virtually everyone but Mr. Trump says there are too few tests, but everyone disagrees about how many are needed.

At a minimum, a state must do enough random testing — including among people with no symptoms — to detect a surge of cases anywhere within its borders. Otherwise, the first unmistakable sign that something is wrong will be the wail of sirens as oxygen-starved patients are taken to a local emergency room.

By then, it may be too late to stop a flood of patients over the next week that will overwhelm that hospital.

In rural America — even in relatively wealthy states like Texas — [financially struggling hospitals](https://www.cbsnews.com/news/texas-reopening-rural-covid-19-spread-60-minutes-2020-05-03/) often have few ventilators, and ambulances must drive long distances.

When hospitals run short on supplies or ambulances fail to promptly reach victims of pneumonia, heart attacks, strokes or car accidents, many lives may be lost, as [happened in New York](https://www.nytimes.com/interactive/2020/04/28/us/coronavirus-death-toll-total.html).

New York has tested more citizens than any other state has — more than twice as many per capita as California, and more than three times as many as Texas. To spot outbreaks early, the Harvard model advocates scaling up, to 20 million tests a day nationwide.

Adm. Brett P. Giroir, the coronavirus task force’s chief of testing strategy, recently [said there was “absolutely no way on earth”](https://time.com/5828843/trump-coronavirus-testing-giroir/) that goal could be reached, and that eight million tests a month, or about 270,000 a day, might be possible by June.

Paul M. Romer, a Nobel Prize-winning economist at New York University, [has called for daily rapid tests for every worker in contact with others](https://www.theatlantic.com/ideas/archive/2020/04/were-testing-the-wrong-people/610234/) — meaning 20 to 30 million tests a day.

At $10 a test, he has conceded, such an undertaking would cost at least $ 1.5 billion a week, but even that is far cheaper, he argued, than the damage now being done by keeping the country locked down.

For now, the lofty goal of tracing and testing the contacts of every infected person remains unthinkable. Epidemiological models in the United States and [data from China](https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf) suggest that each case generates about 50 contacts, so the 25,000 new daily cases in the United States generate another 1.3 million contacts to find each day.

Even under ideal circumstances, a team of five tracers takes about three days to find 50 contacts. So, if the number of trained contact tracers were increased to 100,000 — from 3,000, the most recent tally — the daily case count would still have to drop below 5,000 just to stay even, assuming the tracers worked five-day weeks.

But the daily load is barely dropping below 25,000.

Digitally automating the job has been proposed. But for Bluetooth and GPS apps like those used in South Korea to work in the United States and find a useful percentage of a victim’s contacts — about 80 percent, calculated Tomas Pueyo, author of an article titled “[Coronavirus: How to Do Testing and Contact Tracing](https://medium.com/@tomaspueyo/coronavirus-how-to-do-testing-and-contact-tracing-bde85b64072e)” — Apple and Google would have to update their smartphone operating systems with built-in tracking apps that all cellphone owners would by law have to use. Also, neither location data nor Bluetooth could be turned off.

Americans are unlikely to accept that, Mr. Pueyo conceded.

“We fear ‘1984,’” he wrote. “We want to avoid an A.I.-driven world where the government knows our every movement, rates us according to our behavior, and soon tells us what to think.”

Making masks obligatory has strong potential to cut down transmission, according to new evidence not just from Asia, where masks have long been common, but also from the Czech Republic, Germany, Israel and other countries, [according to Masks4All](https://masks4all.co/), an advocacy group.

The single biggest mistake made in the United States and some European countries that have failed to control their epidemics “is that people aren’t wearing masks,” [argued Dr. George F. Gao](https://www.sciencemag.org/news/2020/03/not-wearing-masks-protect-against-coronavirus-big-mistake-top-chinese-scientist-says), the Harvard- and Oxford-trained director of China’s Center for Disease Control.

Outside New York, California and a few other states, many Americans resist wearing them.

Gov. Mike DeWine of Ohio rescinded an order to wear masks after state residents “felt affronted,” he said. Officials in Stillwater, Okla., dropped a municipal order after store clerks who asked barefaced customers to stay outside were threatened.

The issue has become mired in politics: the president [won’t wear one,](https://www.cnn.com/2020/05/06/politics/donald-trump-mask-arizona/index.html) some protesters [have compared them to Muslim face veils](https://theconversation.com/we-are-all-niqabis-now-coronavirus-masks-reveal-hypocrisy-of-face-covering-bans-136030), and a shopper at a supermarket requiring masks [wore a Ku Klux Klan hood](https://timesofsandiego.com/crime/2020/05/05/santee-vons-shopper-in-kkk-hood-identified-by-sheriffs-department/).

**Neglected Criteria**

In the absence of detailed national reopening standards, governors are setting their own, and some allow far closer human contact than others do.

It is or will soon be possible in 19 states to get your hair cut or roots dyed, for example. Many states are letting restaurants reopen with restrictions that require six feet between diners, outdoor seating only or disposable menus.

By contrast, Gov. Andrew M. Cuomo of New York has refused to even set a date for easing restrictions everywhere in the state, although three regions will be allowed to partially reopen on May 15. Although hospitalizations and deaths are steadily declining, he said, they are still dropping too slowly.

“All of this inconvenience, all of this turmoil, for what?” he asked this month. “To keep 100,000 people out of our hospitals, that’s for what.”

When restrictions are lifted, he said, the state’s least-affected central counties will go first and each economic sector will be phased in slowly: construction and factory jobs first, and retail establishments that can deliver goods curbside. Next: banks, insurance, law firms and other professions. Then restaurants and hotels, and finally entertainment, sports and schools.

One of the most difficult decisions is when to open primary schools. Doing so is crucial to getting young parents back to work, but scientists are still unsure about how much children spread the disease to their families. [France is reopening](https://www.npr.org/sections/coronavirus-live-updates/2020/05/08/852808030/french-education-minister-says-school-reopenings-will-be-done-very-progressively) its schools this week, [as are some regions of Australia](https://www.abc.net.au/news/2020-05-04/australian-schools-reopening-after-coronavirus-closures/12211526) and [much of Europe](https://www.nytimes.com/2020/05/10/world/europe/reopen-schools-germany.html), so there may be some data soon on the question.

Unlike New York State, Florida, Tennessee and Texas are reopening [as their cases and deaths are spiking](https://thehill.com/changing-america/well-being/prevention-cures/495679-coronavirus-cases-deaths-are-spiking-in-some-of) to new highs, which means, experts said, that it is impossible to know when or how high they will peak.

If that happened, a wave of unexpected deaths could deliver some sharp political shocks, researchers predicted.

“Excess fatalities may mean some serious consequences for the governors,” said Dr. Irwin Redlener, director of the disaster preparedness center at Columbia.

Frustrated Americans, eager to break out of lockdowns, often do not realize how lax this country’s strictures are compared with those imposed elsewhere.

In Chinese cities, only a tiny corps of essential workers was allowed to leave home for months. There was virtually no travel between cities.

People lucky enough to live in apartment complexes with internal gardens could walk there; others had to stay indoors, unable to shop even for food or medicine. Building committees pooled grocery orders and distributed them internally.

No city in China was allowed to reopen until it had reached 14 days of zero new cases — a standard that no American city is expected to meet.

In Italy, many residents were not allowed to go more than 200 yards from their homes without written government authorization. Police roadblocks enforcing that rule were everywhere.

If deaths in the United States surged, harsh measures like those could, in theory, be imposed.

The 1918 Spanish flu provides some lessons.

A [new analysis](https://www.nber.org/papers/w27049.pdf) of that epidemic from the National Bureau of Economic Research in Cambridge, Mass., concluded that various lockdown measures had “clear success” in lowering death rates. But they ultimately failed to curb overall mortality in most cities because they were lifted prematurely.

School closings and bans on public gatherings typically lasted only 36 days, the report said, and Americans usually tolerated quarantine for only 18 days.

Denver, for example, closed its schools and banned public gatherings for only one month after deaths peaked. Then reopening caused [a second, much higher peak of deaths](https://marginalrevolution.com/marginalrevolution/2020/03/what-worked-in-1918-1919.html).

“The lesson for the ongoing coronavirus pandemic in 2020 is that, to curtail overall deaths,” wrote the chief author, Robert J. Barro, such interventions “have to be maintained for substantially longer than a few weeks.”

“Most likely,” he added, “12 weeks work much better than four to six weeks.”

**Uncontrolled Experiments**

Dr. Frieden, the former C.D.C. director, now runs Resolve to Save Lives, the public health advocacy group that has issued detailed reopening guidelines.

“Every day, I look at the two models for approaching this,” he said. “The China model, which is to use the world’s most authoritarian regime and best digital tracking system to hunt down and stop every case and then wait for a vaccine. So far, it’s working.”

By contrast, he said, Sweden is trying to achieve “herd immunity” by letting young, healthy people become infected at what they hope will be slow, steady rates. Primary schools are open, higher ones are closed, everyone is asked to be careful in public and older adults are asked to stay home.

Israel is roughly following Sweden’s model, Dr. Frieden said, just as Asian countries are roughly following China’s.

“And then,” he added, “there’s the American approach, which is: ‘What the hell — I heard something on Fox News. Let’s try it!’”

Sweden’s model does look appealing. Television news programs have shown smiling Swedes drinking in outdoor cafes, shopping for clothes, getting their hair restyled and enjoying other little pleasures that Americans have been denied for many weeks now.

But Sweden is paying a high price, and Dr. Frieden rated its success as “still to be determined.”

As of Sunday, its [per capita death rate](https://www.worldometers.info/coronavirus/) is 319 per million Swedes, which is higher than the figure in the United States, which is 242 deaths per million.

Other Scandinavian countries, with varying degrees of lockdown, have far lower death figures: 91 per million in Denmark, 40 in Norway, 48 in Finland and 29 in Iceland.

Having 50 states and more territories do competing and uncoordinated experiments in reopening is “daring Mother Nature to kill you or someone you love,” Dr. Frieden said. “Mother Nature bats last, and she bats a thousand.”