



HEALTH CARE

A National and State Plan To End the Coronavirus Crisis

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Getty/John Moore

A doctor and nurse converse before testing patients for the coronavirus at the University of Washington Medical Center on March 13, 2020, in Seattle.

The Trump administration has failed to develop a coherent, evidence-based plan to end the coronavirus crisis. Because the administration did not take the pandemic seriously when cases first emerged in the United States, our response is now far behind that of countries such as South Korea; as a result, our death toll will be far higher.* Although President Donald Trump reversed course and extended the federal government's physical distancing guidelines from April 12 through April 30, the guidelines are not aggressive enough. April 30 is still too early, and the steps necessary to ease restrictions have not been laid out. Most importantly, we need to act now to ensure the country has developed the necessary health infrastructure to allow us to gradually reopen our economy. A comprehensive, multifaceted plan is needed to reopen the economy without sparking a second wave of infections.

In the vacuum of federal leadership, governors and mayors of many states and cities have taken the lead in implementing aggressive measures to suppress transmission. Now they may well need to take the lead in developing a plan to end the crisis.

Without a coherent, evidence-based plan in place—a path forward, clear benchmarks, and an end in sight—the public and government officials may grow weary of physical distancing prematurely. The result would be repeated waves of exponential transmission followed by lockdowns, wreaking havoc on the economy and peoples' lives. It will be far more devastating to our economy—and to public health—to experience waves and waves of virus response rather than properly return to normal when it is truly safe. Americans are willing to make sacrifices and do their part to break transmission, but they need to have faith that there is a plan in place that will work. There is no conflict between aggressive public health measures that save lives and economic growth: In a [study](#) of the 1918 Spanish flu pandemic, cities that intervened earlier and more aggressively had faster economic growth after the pandemic.

In order to contemplate reopening the economy, even in phases, the following components are necessary:

- A stay-at-home policy for a minimum of 45 days starting April 5
- Ramping up testing to South Korean levels so that every individual who has a fever, and every member of a household of a positive case, has access to a test
- Robust surveillance testing of representative samples of every county, including counties that are not reporting any cases

- Instantaneous contact tracing and isolation of individuals who were in close proximity to a positive case
- Public alerts and mapping to inform the general public of the location of COVID-19 cases
- Isolation of individuals who test positive for COVID-19, individuals who have a fever, and front-line health care workers
- Restrictions of mass transit
- Guidelines for the use of face masks
- Benchmarks for when restrictions can be eased, with some restrictions on large gatherings and mass transit remaining until herd immunity is achieved

If the federal government refuses to implement such a plan, states are not powerless to act and can proceed to follow this plan in order to ease restrictions for their residents.

Step #1: National and state stay-at-home policy

Physical distancing is [proven to work](#) and is working in the United States, although robust results will take more time to emerge. Unfortunately, a patchwork of policies is currently in effect across the states. Due to exponential spread, states with loose restrictions will experience accelerating cases before they are observed in testing and before a stay-at-home order can have the most beneficial impact. In general, developed countries have a national policy at this point, not a patchwork of regional policies. A consistent national policy must be put in place for a sufficient time period in order to suppress transmission to levels that would allow the easing of restrictions.

Current status of physical distancing

There is evidence that the nation as a whole is not aggressively implementing physical distancing. [Unacast](#), a company that analyzes phone GPS data, estimates that physical distancing has reduced average movements nationwide by only 40 percent to 55 percent, with deep differentials between states that have implemented stay-at-home orders and those that have not.

In [Italy](#), the government was reactive, rather than proactive, in implementing lockdowns. At first, restrictions were put into place only in “red zones” but ultimately had to be expanded throughout the country, wasting valuable time. Due to the exponential nature of transmission, a matter of days can significantly alter the epidemic’s trajectory. The United States is repeating Italy’s mistake. Many

states, observing relatively low case counts at the moment, mistakenly believe they are immune to exponential spread.

The following 11 states have not closed nonessential businesses or issued a stay-at-home order statewide: Alabama, Arkansas, Iowa, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming. Florida shows the risk of delayed action: Its case count is [now exploding](#).

Breaking community transmission

The goals of physical distancing are to buy enough time to implement the steps outlined below and suppress community transmission down to levels that would allow the United States to implement South Korea's model.

South Korea's model

South Korea successfully suppressed transmission by ramping up testing quickly at screening clinics and drive-through centers. The government also uses technology to notify individuals on their phone if they have been in close proximity to an individual who has tested positive for COVID-19. Mobile alerts and public maps inform the general public of the locations of COVID-19 cases. Provinces and cities designate lodgings or other facilities as "living and treatment support centers" to isolate individuals with suspected symptoms.

At the height of transmission in South Korea, the country was averaging [730 new cases](#) per day, or about 18 new cases per million people per day. At these levels, as described below, South Korea was able to suppress transmission without locking down society. Indeed, in most of South Korea, people have been working throughout the global crisis. Currently, the United States is averaging [nearly 25,000 new cases](#) per day, or about 76 new cases per million people per day—and that number is rising sharply. National and state stay-at-home policies must remain in place until these levels are brought down to South Korean levels and we can determine where emerging outbreaks are through testing.

In China, a lockdown of two months achieved near-zero transmission, although the government does not count asymptomatic positive cases. On March 23, officials reported that there had been [no](#)

[new cases](#) for five consecutive days in Hubei, the province where Wuhan is located. Last week, Hubei began to lift restrictions within the province.

China's lockdown was enormously successful in suppressing transmission. The COVID-19 reproduction number (R0)—the average number of people infected by each infected person—fell from [2.35](#) before the restrictions to 1.05 soon after. Some [research](#) indicates that the R0 fell further to well below 1.0 in February. To break transmission, this number must be at or below 1.0.

Using the [Susceptible, Exposed, Infected and Resistant](#) model developed by the University of Toronto, it is possible to project the impact of physical distancing on transmission. If restrictions are lifted on April 30, as proposed by President Trump, the model projects that 41.1 million Americans would become infected by late October, with 4.9 million infected at the peak in mid-July. An estimated 334,500 people would die. It is important to note that this projection assumes aggressive physical distancing—closure of businesses and transportation—which has not been implemented throughout the United States to date.

In order to break transmission through October—new cases would still occur, but at a flat rate—aggressive physical distancing would need to be in place for 45 days starting April 5, according to the model. In this scenario, the model projects that 15.7 million Americans would become infected by late October, with 5.2 million infected at the peak in mid-April. An estimated 139,600 people would die. After the peak in April, the number of new cases would decline and stabilize this summer. In October, transmission would begin to slowly grow again, absent other measures. According to the model, aggressive physical distancing for 60 days would almost completely suppress transmission through November.

Given that many state and local governments began physical distancing two weeks ago, a 45-day stay-at-home policy starting April 5 would be roughly equivalent in length to the Chinese lockdown. However, many states have not issued a stay-at-home order, few states have enforced their orders, and the Chinese lockdown was stricter than U.S. stay-at-home orders (for example, trips to grocery stores were regulated).

Based on the available evidence, the federal government must provide guidance on, and states must implement, a stay-at-home policy for a minimum of 45 days starting April 5, subject to extension based on conditions on the ground. Congress must reevaluate whether additional economic relief for small businesses and unemployed individuals is needed based on the length of this period. During this 45-day window, federal and state governments must rapidly implement or prepare to implement the following necessary steps.

Step #2: Ramp up testing and production of personal protective equipment

The United States has increased COVID-19 testing to about [296 tests](#) per million per day as of March 31. However, the United States still significantly lags behind South Korea in [cumulative tests](#) per capita: 3,345 tests per million compared with 7,971 tests per million. If the United States had the same number of tests per million as South Korea right now, that would be equivalent to 2.6 million tests.

This number of tests is possible to achieve soon. Last week, [Abbott Laboratories](#) announced U.S. Food and Drug Administration (FDA) emergency authorization for a rapid point-of-care test that can deliver results in fewer than 15 minutes (without shipment to a lab). The company claims that it will be able to produce 50,000 tests per day, or a total of 2.25 million tests during the 45-day window, by itself.

Ultimately, the number of tests needed should be guided by conditions on the ground. If any individual has a fever, that individual must be tested. If any individual tests positive for COVID-19, every member of that household must also be tested. To minimize the risk of transmission in hospitals and reduce their burden, South Korea set up screening clinics at public health centers and drive-through centers to test individuals with suspected symptoms. States and hospitals should set up similar screening clinics and centers.

In addition, state and local public health agencies must conduct surveillance testing. In Seattle, the [Seattle Coronavirus Assessment Network](#) sends swab kits to a representative sample of households. This sampling ensures that asymptomatic individuals who have the virus are discovered, providing an accurate picture of the spread of the virus in a community. This type of surveillance will enable officials to determine when transmission in a community has been broken and restrictions can be eased.

In addition to diagnostic tests of genetic material from nasal or throat swabs, blood tests could be helpful. These tests, known as serological tests, detect antibodies that the immune system produces in response to infection. Epidemiologists typically use these tests for surveillance and research after the fact to determine the spread of an epidemic. Because serological tests are relatively inexpensive and provide rapid results at the point of care, they can complement diagnostic tests to rapidly scale surveillance testing of representative samples of each community.

In theory, serological tests could also prove individuals' immunity, clearing people to go back to work. The science of whether COVID-19 infection confers full or partial immunity, and for how long, is still [unknown](#). The level of antibodies necessary to prove immunity is also unknown. A number of patients in [China and Japan](#) recovered from COVID-19 but were reinfected and became sick again.

In Germany, researchers at the [Helmholtz Centre for Infection Research](#) plan to give serological tests to 100,000 people in April to [study](#) the extent of antibodies in the population beyond those who have tested positive for COVID-19. Currently, the tests cannot always distinguish between normal coronaviruses and COVID-19, but the researchers hope to have more precise tests in [two to three months](#).

It is unlikely that the science of immunity and precision of tests will be established before the recommended stay-at-home policy in the United States expires. Given that relatively few people will have been exposed during the 45-day period, the value to states of purchasing and administering serological tests to clear them to go back to work is probably low. However, if the stay-at-home policy needs to be extended significantly, and the science and precision can be established, serological tests would be necessary to clear people to go back to work. Medical providers would issue immunity forms much in the same way that they issue vaccination forms that are required by schools.

Transmission cannot be broken, and testing cannot be conducted at scale, if health care workers do not have access to adequate personal protective equipment (PPE). Widespread drive-through testing, for example, is not possible unless volunteers can be trained and equipped with PPE. The U.S. Department of Health and Human Services estimates that health care workers will need [300 million](#) N95 respirator masks. In addition, gowns, gloves, and goggles must be supplied before restrictions can be eased.

Step #3: Instantaneous contact tracing and isolation

The traditional public health response to an infectious disease is contact tracing and isolation to prevent the spread of the disease. When there is a confirmed case or symptomatic individual, teams of investigators track the contacts that the individual had and isolate those individuals—a process known as manual contact tracing. For COVID-19, however, up to half of transmissions occur from presymptomatic individuals. According to recent modeling from the [University of Oxford](#), this means that manual contact tracing is not nearly fast enough to slow transmission. However, technology can be used to conduct instantaneous contact tracing, eliminating the delay between the confirmation of

a case and notification of contacts. The University of Oxford model projects that instantaneous contact tracing could help reduce the reproductive number to less than 1.0, breaking transmission.

In South Korea and Singapore—two nations that have suppressed transmission—the use of technology to conduct instantaneous contact tracing has been pivotal to their success. These nations use [mobile phone apps](#) or mobile telecommunications infrastructure to notify individuals on their mobile phone through notifications or text messages if they have been in close proximity to an individual who has tested positive for COVID-19. These methods use GPS, Bluetooth, cell tower, and Wi-Fi network data to identify whether the user's phone pinged the same signals as the phone of a COVID-19-positive individual during the same time period. In South Korea, mobile alerts and public maps inform the general public of the locations of COVID-19 cases.

To adopt a similar but more civil-liberties-sensitive solution in the United States, several protections must be put in place. The entity that hosts the data must be a trusted, nonprofit organization—not private technology companies or the federal government. The app could be developed for a purely public health nonprofit entity such as the Association of State and Territorial Health Officials (ASTHO)—an organization that represents state health officials—which would host the data. Congress or foundations could provide funding to develop and operate the technology. States licensing the app could provide ongoing operational funding to ASTHO, provided states receive federal funding for this purpose.

Additional protections must include the following:

- The amount of data needed and shared must be minimized
- This system must be transparent
- Data must be collected, secured, and stored within the United States
- Data must be automatically deleted after every 45 days
- The sharing of data with the federal government, except for the Centers for Disease Control and Prevention (CDC), must be prohibited
- The sharing of data with state and local government agencies that are not public health agencies must be prohibited
- The sharing of data with third parties and the sale of data must be prohibited
- Any data shared publicly must be anonymized

As a condition of receiving a COVID-19 test in the future, individuals may be required to download the app, which would include their test result. For others, the app would be voluntary, although the vast majority of people could be expected to download it to see if there are cases in their neighborhood or near their workplace.

Although manual contact tracing by itself will not be effective in stopping transmission, the tracing teams of state and local health agencies must be expanded to follow up on contact tracing from the app. In addition, CDC teams must be expanded and deployed to areas that are emerging hot spots, working jointly with local teams.

In South Korea, individuals with suspected symptoms are isolated. Provinces and cities designate lodgings or other facilities as “living and treatment support centers” and provide kits that include toiletries, masks, a thermometer, and medicine. Individuals are monitored twice a day and transferred to hospitals if symptoms worsen or discharged when symptoms subside.

States must set up similar centers to isolate confirmed and suspected cases on a voluntary basis. Individuals who test positive for COVID-19 and individuals who have a fever should be isolated in designated, repurposed hotels, college dormitories, or other facilities at government expense. States must also provide hotels for front-line health care workers so that they can protect their families.

Step #4: Travel restrictions and protections

Normal daily mobility levels are very high: On an average weekday before the COVID-19 pandemic, 34 million Americans boarded transit and 2.5 million Americans boarded flights. Any return to a semblance of normality will require several restrictions and protections to minimize the risk of transmission from daily operations.

During the stay-at-home period, nonessential travel must be prohibited. State and local governments must use aggregated, anonymized cellular data to assess compliance with stay-at-home orders and determine whether targeted enforcement is necessary. [Unacast](#) already provides this data at the county level, estimating the reduction in average movements. For example, Washington, D.C.—the best-performing jurisdiction—has reduced average movements by 60 percent.

Transportation workers—including ticketing agents, Transportation Security Administration (TSA) screeners, flight attendants, bus drivers, and subway workers—are essential front-line workers who

must be provided with N95 respirator masks, gloves, and paid sick leave. Additional protections include:

- Airline passengers must download the Contact Tracing app, confirm no close proximity to a positive case, and pass a fever check or show documentation of immunity from a serological test
- The TSA must adjust screening procedures to ensure physical distancing and limit airport terminal access to ticketed passengers only
- Planes, trains, buses, and paratransit vans must be sanitized with deep cleaning on a daily basis
- Subways, buses, and transit stations must limit the number of passengers to 50 percent capacity
- Buses must install protective separation for bus drivers

Many of these measures will require an infrastructure investment or reduce operational revenue. Their implementation requires Congress to provide ongoing operational subsidies for the next 18 months until herd immunity has been established.

Step #5: Guidelines for the use of face masks

For the general public, a [systematic review](#) of studies found that N95 respirator masks and surgical masks were effective in reducing transmission of respiratory viruses. Another [study](#) found that widespread use of face masks in public provided significant protection against SARS. In 2019, the [World Health Organization](#) (WHO) reviewed 10 randomized controlled trials on the use of face masks to protect against influenza. The review found an average risk reduction of 22 percent in the face mask group, although this result was not statistically significant. The WHO recommends the use of face masks by asymptomatic individuals in severe pandemics and the use of disposable surgical masks by symptomatic individuals.

Because N95 respirator masks and surgical masks are in short supply and must be reserved for health care workers in the near term, the question is whether the general public should use homemade cloth masks. Some limited evidence—two experimental studies with very small samples—exists that while homemade masks are much less protective than N95 respirator masks and surgical masks, they may still confer some degree of protection. In one [study](#), the particle concentration was 2.4 times greater outside a tea cloth mask than inside the mask. Surgical masks provided about twice as much protection as homemade masks, and respirator masks provided about 50 times as much protection as homemade masks. In another [study](#), the filtration efficiency

was 51 percent to 69 percent for a mask made of a 100 percent cotton T-shirt, 72 percent to 83 percent for a mask made of a tea towel, and 90 percent to 96 percent for a surgical mask.

The CDC should issue guidelines on the use of masks until herd immunity is achieved. In the absence of federal guidelines, states could issue their own guidelines. Given the low cost of homemade cloth masks and that two studies have demonstrated mechanistic efficacy, the CDC and states should issue guidelines on how to make and use cloth masks.

Step #6: Targeted, gradual lifting of restrictions

National and state stay-at-home policies must remain in place for a minimum of 45 days starting April 5. At that point, officials should be guided by conditions on the ground—not an arbitrary timetable. The following conditions must be satisfied before a state can lift its stay-at-home order:

- Transmission in the state is suppressed to South Korean levels of about 20 new cases per million people per day and the number of new cases per day is declining
- Every resident of the state who has a fever, and every member of a household of a positive case, has access to a COVID-19 diagnostic test
- Instantaneous contact tracing to limit any outbreaks
- Every front-line health care worker in the state has access to PPE
- A robust surveillance system is in place, which is necessary to verify the first condition, that is testing throughout the country regularly

States that are integrated regionally—such as New York, New Jersey, and Connecticut or Maryland, Virginia, and Washington, D.C.—must act in coordination. When a state lifts its stay-at-home order, some physical distancing must remain in place until herd immunity is achieved. Employers must continue to allow telework to the extent possible; the transportation protections outlined above must remain in place; and gatherings of more than 50 people must continue to be banned. Once herd immunity has been achieved through mass vaccination, all remaining restrictions can be lifted.

Conclusion

The steps that need to be taken to end the coronavirus crisis are not unknown; they are clear and informed by evidence and the experience of other countries. The public deserves a plan of action to ease and ultimately lift restrictions in a careful manner that does not risk a resurgence of the

epidemic, resulting in an endless cycle of infection waves and economic depression. The federal government and states need to take these steps and implement these systems, at a minimum, to prevent a second wave that is worse than the first and allow a return to some degree of normal life.

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**Authors' note: Currently, the United States has [5,138 deaths](#) and 3.3 deaths per million, compared with 169 deaths and 0.12 deaths per million in South Korea.*

To find the latest CAP resources on the coronavirus, visit our [coronavirus resource page](#).



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