

NEWS DESK

KEEPING THE CORONAVIRUS FROM INFECTING HEALTH-CARE WORKERS

What Singapore's and Hong Kong's success is teaching us about the pandemic.



By Atul Gawande

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The success of Hong Kong and Singapore in stemming the spread of the coronavirus holds many lessons for how to contain it in the United States. Photograph by Tsuji Keith / Abaca / ZUMA

The message is getting out: #StayHome. In this early phase of the coronavirus pandemic, with undetected cases accelerating transmission even as testing ramps up, that is critical. But there are many people whom the country needs to keep going into work—grocery cashiers, first responders, factory workers for critical businesses. Most obviously, we need health-care workers to care for the sick, even though their jobs carry the greatest risk of exposure. How do we keep them seeing patients rather than *becoming* patients?

In the index outbreak in Wuhan, thirteen hundred health-care workers became infected; their likelihood of infection was more than three times as high as the general population. When they went back home to their families, they became prime vectors of transmission. The city began to run out of doctors and nurses. Forty-two thousand more had to be brought in from elsewhere to treat the sick. Luckily, methods were found that protected all the new health-care workers: none—*zero*—were infected.

The New Yorker's coronavirus news coverage and analysis are free for all readers.

But those methods were Draconian. As the city was locked down and cut off from outside visitors, health-care workers seeing at-risk patients were housed away from their families. They wore full-body protective gear, including goggles, complete head coverings, N95 particle-filtering masks, and hazmat-style suits. Could we do that here? Not a chance. Health-care facilities don't remotely have the supplies that would allow staff members to see every patient with all that gear on. In Massachusetts, where I practice surgery, the virus is circulating in at least eleven of our fourteen counties, and cases are climbing rapidly. So what happens if you are exposed to a coronavirus patient and you don't have the ability to go full Wuhan? My hospital system, Partners HealthCare, has already sent more than a hundred staff members home for fourteen days of self-quarantine because they were exposed to the coronavirus without complete protection. If we had to quarantine every health-care worker who might have come into contact with a COVID-19 patient, we'd soon have no health-care workers left.

Yet there are lessons to be learned from two places that saw the new coronavirus before we did and that have had success in controlling its spread. Hong Kong and Singapore—both the size of my state—detected their first cases in late January, and the number of cases escalated rapidly. Officials banned large gatherings, directed people to work from home, and encouraged social distancing. Testing was ramped up as quickly as possible. But even these measures were never going to be enough if the virus kept propagating among health-care workers and facilities. Primary-care clinics and hospitals in the two countries, like in the U.S., didn't have enough gowns and N95 masks, and, at first, tests weren't widely available. After six weeks, though, they had a handle on the outbreak. Hospitals weren't overrun with patients. By now, businesses and government offices have even begun reopening, and focus has shifted to controlling the cases coming into the country.

Here are their key tactics, drawn from official documents and discussions I've had with health-care leaders in each place. All health-care workers are expected to wear regular surgical masks for all patient interactions, to use gloves and proper hand hygiene, and to disinfect all surfaces in between patient consults. Patients with suspicious symptoms (a low-grade fever coupled with a cough, respiratory complaints, fatigue, or muscle aches) or exposures (travel to places with viral spread or contact with someone who tested positive) are separated from the rest of the patient population, and treated—wherever possible—in separate respiratory wards and clinics, in separate locations, with separate teams. Social distancing is practiced within clinics and

hospitals: waiting-room chairs are placed six feet apart; direct interactions among staff members are conducted at a distance; doctors and patients stay six feet apart except during examinations.

What's equally interesting is what they *don't* do. The use of N95 masks, face-protectors, goggles, and gowns are reserved for procedures where respiratory secretions can be aerosolized (for example, intubating a patient for anesthesia) and for known or suspected cases of COVID-19. Their quarantine policies are more nuanced, too. What happens when someone unexpectedly tests positive—say, a hospital co-worker or a patient in a primary-care office or an emergency room? In Hong Kong and Singapore, they don't shut the place down or put everyone under home quarantine. They do their best to trace every contact and then quarantine only those who had close contact with the infected person. In Hong Kong, "close contact" means fifteen minutes at a distance of less than six feet and without the use of a surgical mask; in Singapore, thirty minutes. If the exposure is shorter than the prescribed limit but within six feet for more than two minutes, workers can stay on the job if they wear a surgical mask and have twice-daily temperature checks. People who have had brief, incidental contact are just asked to monitor themselves for symptoms.

The fact that these measures have succeeded in flattening the COVID-19 curve carries some hopeful implications. One is that this coronavirus, even though it appears to be more contagious than the flu, can still be managed by the standard public-health playbook: social distancing, basic hand hygiene and cleaning, targeted isolation and quarantine of the ill and those with high-risk exposure, a surge in health-care capacity (supplies, testing, personnel, wards), and coordinated, unified public communications with clear, transparent, up-to-date guidelines and data. Our government officials have been unforgivably slow to get these in place. We've been playing from behind. But we now seem to be moving in the right direction, and the experience in Asia suggests that extraordinary precautions don't seem to be required to stop it. Those of us who must go out into the world and have contact with people don't have to panic if we find out that someone with the coronavirus has been in the same room or stood closer than we wanted for a moment. Transmission seems to occur primarily through sustained exposure in the absence of basic protection or through the lack of hand hygiene after contact with secretions.

Consider a couple of data points. Singapore so far appears not to have had a single recorded health-care-related transmission of the coronavirus, despite the hundreds of cases that its medical system has had to deal with. That includes one case reported this week of a critically ill pneumonia patient who exposed forty-one health-care workers in the course of four days before being diagnosed with COVID-19. These were high-risk exposures, including exposures during intubation and hands-on intensive care. Eighty-five per cent of the workers used only surgical masks. Yet, owing to proper hand hygiene, none became infected.

Our early experiences in the U.S. have so far been similar. The Centers for Disease Control and Prevention, in the face of limited information, recommended stricter precautions than have been employed in Asia, putting health-care workers on fourteen-day self-quarantine if they are exposed to an infected person for even a few minutes without protection, including a mask and goggles. That policy was implemented at U.C. Davis Medical Center, where the first case of community transmission was diagnosed, in late February. Eighty-nine health-care workers involved in the patient's care were put under self-quarantine. None, it turned out, had been infected. Sacramento, Seattle, and San Francisco became coronavirus hot spots; as of this writing, however, significant occupational transmission has not been found.

Meanwhile, the strict policy has been threatening to close entire emergency departments. So, out of necessity and based on the early evidence, public-health authorities in San Francisco have loosened restrictions, letting exposed employees stay at work as

long as they wear a surgical mask and don't have symptoms. At least one hospital in Seattle is now following a similar policy, with the support of state public-health officials *and* the C.D.C. Other hospitals across the country will likely soon follow. The factors that appear to be important in protecting health-care workers from the disease have been insuring meticulous hand hygiene and cleaning; restricting clinics and hospitals to necessary patient visits; shifting as much care as possible to virtual channels (such as phone and video); and applying standard droplet precautions (surgical mask, gloves, and gown) with respiratory patients.

For those who cannot stay home, the lesson is that it is feasible to work and stay coronavirus-free, despite the risks. Deborah Yokoe, the medical director of hospital epidemiology and infection prevention at U.C.S.F. Medical Center, told me that, given the safety practices in the hospital, she is seeing a greater likelihood of staff picking up infections at home than at work. Following this logic, San Francisco public-health officials are pushing medical facilities to have all health-care workers—not just those who have had patient exposures—report whether they have fever or flu symptoms prior to starting work each day.

In South Korea, the success of mass testing in containing the spread of the disease has raised the possibility that asymptomatic carriers were causing outbreaks. But another implication of the experience in Singapore and Hong Kong is that these essentially invisible cases of the coronavirus may not be driving as many serious infections as some scientists have projected. Health officials there did not conduct mass testing of the population to look for infected people without symptoms. They focussed on aggressively searching out and testing only those who developed suspicious symptoms or had high-risk exposures in the community. They accepted that the virus might circulate among people who notice nothing. Yet their strategy brought cases under control.

There are a number of possible explanations for this. One is that truly asymptomatic cases—people who never develop symptoms that would prompt evaluation—may be less common than feared. In Wuhan, where testing became widespread and more than seventy-two thousand coronavirus cases were identified, just one per cent never developed symptoms. Aboard the Diamond Princess cruise ship, where, following an outbreak, more than three thousand passengers and crew were quarantined and tested—allowing one of the most complete evaluations of any affected population—six hundred and thirty-four people proved to have the virus. Most had no symptoms at the time of testing, but they proved to be pre-symptomatic: over several days, they developed recognizable signs of the disease. Just eighteen per cent were persistently asymptomatic.

We know that people are less contagious while they have no symptoms, but not *how* much less. The success that Hong Kong and Singapore achieved by screening for people with fever- or flu-like symptoms suggests that the risk of asymptomatic contagion could be much lower than we thought. That experience gives some guidance for what to do not only in health care but wherever the coronavirus is circulating and people have to go physically into work. There'll be more information as testing expands and we continue to adjust our strategies. Nonetheless, we are finding our way.

When you have no choice but to leave home and go in to work while the case counts rise around you, it is hard not to panic. But we can learn from the experiences of our colleagues across the planet. The pandemic is global; its lessons are, too.

A GUIDE TO THE CORONAVIRUS

- How to practice social distancing, from responding to a sick housemate to the pros and cons of ordering food.
 - How people cope and create new customs amid a pandemic.
 - What it means to contain and mitigate the coronavirus outbreak.
 - How much of the world is likely to be quarantined?
 - Donald Trump in the time of coronavirus.
 - The coronavirus is likely to spread for more than a year before a vaccine could be widely available.
 - We are all irrational panic shoppers.
 - The strange terror of watching the coronavirus take Rome.
 - How pandemics change history.
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