From: Schwartz, David
Subject: DOM Covid Communication
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Attachments: Hospitals_NYT.pdf
Clinicians_NEJM.pdf
Gawande_NewYorker.pdf

Dear Friends and Colleagues.

I hope you, your family, and your friends are remaining well. I read 3 articles (attached) last night that raised a few issues that I think are relevant to our transition to the next stage of this crisis. Although the number of Covid hospitalizations and deaths have decreased both in the state of Colorado (https://covid19.colorado.gov/data/case-data) and at UCH (down 30 % since the beginning of May), we continue to be faced with considerable challenges, some of which I'll discuss below:

- **Clinical:** The number of Covid+ patients have decreased at UCH and the VA, yet continue to hover around 60 at DH. Despite this overall decrease, we're continuing to care for a substantial number of Covid+ patients while we're restarting components of the clinical enterprise. I thought Gawande's article (attached) was particularly effective in discussing the safest approach to make this transition and avoid workplace transmissions. Gawande provided ample support for rigorous use of hygiene measures, screening, distancing, and masks, however, he went on to discuss the cultural challenges faced by our profession during this transition phase. Gawande's point (which I agree with) is that we need to hold each other to a higher standard of accountability and challenge each other to do the little things that prevent spread of SARS-CoV-2 while restarting the clinical enterprise. Let's keep each other safe, and build on and extend the cultural strengths of interdisciplinary collaboration that we've solidified over the past couple of months. Covid patients and the risk of Covid transmission will be with us for a while. Let's establish a **culture of mutual accountability** with the goal of preventing workplace transmission.
- **Educational:** Our educators are truly amazing, and they're showing more flexibility than many of us (I'm referring to myself here). They've invented new ways of including our students and trainees in the clinical and research enterprises and incorporating established methods of mentorship with limited bedside teaching or lab based research. Celebrating the graduation of our students and trainees virtually, and onboarding interns without face-to-face orientations will challenge even their creativity, as well as their newfound zoom communication skills. But these changes will also challenge how we as educators and mentors interact with our students and trainees. It will take more effort and dedication on our part but I know it will be worth it for all involved.
- **Research:** Patience is the cornerstone here. We've all got the same goal of re-establishing a thriving research enterprise. While our ideas, approaches, and tactics may be different, let's put those differences aside and be patient with the process. All of win if no one gets infected with coronavirus and we end up with a fully functional

research operation. Accelerating this process will only put our colleagues and staff at risk, and will jeopardize our ability to do research. Science will lead the way out of this crisis, so let's take the time to establish a safe environment for science to flourish.

- **Financial:** The department, school, and hospital have taken a substantial financial hit. We're clearly not alone, and our hospital partner has suffered proportionately much more than we have departmentally (read the NYT article I've attached). Based on what we know, we anticipate a $4.3M loss in FY20 and a $2.9M loss in FY21 in our department, and will rely on contributions from our divisions, the department, and our departmental leadership to address these deficits. However, it's important for you to understand that we receive substantial amounts of support from our partners, the school and hospital, each year and it's likely that we'll see reductions in support from our partners in FY21. What we're experiencing has to be viewed within the context of an unprecedented global financial crisis, and we need to work together to address these fiscal realities. We'll need to be nimble and strategic in adapting to a new norm and responding with understanding when we're faced with our own deficits and less support from our partners. Rest assured, however, that in addressing these financial challenges my primary goals are to continue to support our faculty, trainees, and staff, and the educational and research programs that we've built over the past decade.

I need your help in addressing the well-being of our faculty, staff, and trainees. We are the front line responders in this pandemic and being in that position has tested our resolve. We've risked our lives and we've all been changed in ways we hadn't imagined. While some of you may be experiencing mental stress (superb 5/13/20 Medicine Grand Rounds that addressed this issue and provides resources; https://youtu.be/2ymRbA7ikeM) or burnout (see NEJM article attached), I want to raise what I consider to be an equally important challenge to our workforce. I've become increasing concerned with our faculty, trainees, and staff who are balancing new demands in the workplace with new demands at home. Families with young children are especially at risk, and I feel for all of you. I remember how demanding it was to have a two career family with young children pre-Covid. Looking back, that was nothing compared to what you face. Childcare, school, summer plans, and home schooling combined with changes in our clinical, educational, and research operations, and possibly unexpected problems with the job of your spouse/partner puts everything at risk. I've already made it clear to NHLBI and others that I know at the NIH that we need to create options for our young trainees and investigators, however, I also recognize that this goes well beyond our trainees and investigators, and affects many of you not involved in research. Marisha Burden has agreed to help me think through this problem for our department and consider our options. However, if you have thoughts, please send them to both of us. I recognize that this is a real problem and we will do what we can with our limited resources to help you get through this.

Our collective recovery is my priority. I hope you stay well and can handle the transition, as well as the uncertainty. Please send me your thoughts, and let me know what else needs to

be addressed. Stay well and stay connected. My very best wishes.
David

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The NEW ENGLAND JOURNAL of MEDICINE

Perspective

Preventing a Parallel Pandemic — A National Strategy to Protect Clinicians' Well-Being

Victor J. Dzau, M.D., Darrell Kirch, M.D., and Thomas Nasca, M.D.

The Covid-19 pandemic, which had killed more than 60,000 Americans by May 1, has been compared with Pearl Harbor and September 11 — cataclysmic events that left indelible imprints on the U.S. national psyche. Like the volunteers who flooded into Manhattan after the World Trade Center attacks, the health care providers working on the front lines of the Covid-19 pandemic will be remembered by history as heroes.

These courageous people are risking their lives, threatened not only by exposure to the virus but also by pervasive and deleterious effects on their mental health. Tragically, we are already seeing reports of clinicians dying by suicide amid the pandemic, including the highly publicized death of a prominent emergency medicine physician in Manhattan, the epicenter of the U.S. Covid-19 outbreak.[1] Before the virus struck, the U.S. clinical workforce was already experiencing a crisis of burnout. We are now facing a surge of physical and emotional harm that amounts to a parallel pandemic.

Just as the country rallied to care for September 11 first responders who suffered long-term health effects, we must take responsibility for the well-being of clinician first responders to Covid-19 — now and in the long run. We are calling for several immediate actions to lay the groundwork for a clear and accountable national strategy to safeguard the health and well-being of our clinician workforce (see box).

The first locus of responsibility is health systems and other employers of clinicians. Organization leaders need to understand and squarely confront the unprecedented strains on their workforce. Underlying clinicians' anxieties over the scarcity of personal protective equipment and limited availability of testing is the fear of spreading the disease among patients and coworkers or bringing it home to their families. Clinicians have expressed uncertainty about whether employers would support them if they got sick. Amid extra-long work hours, many are also being asked to fill emergency roles for which they feel underprepared.[2] As the Covid-19 crisis stretches on, the burden of stress will only mount.

After the 2003 SARS outbreak in Toronto, studies found high levels of emotional distress among hospital workers — stemming from social isolation, the pain of losing colleagues to the disease, and social stigma associated with exposure to SARS, among other factors.[3] Stigma, including self-stigmatization, was also a problem

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Five High-Priority Actions to Protect Clinicians' Well-Being during and after the Covid-19 Crisis.

Organizational Level

Integrate the work of chief wellness officers or clinician well-being programs into Covid-19 "command centers" or other organizational decision-making bodies for the duration of the crisis.

Ensure the psychological safety of clinicians through anonymous reporting mechanisms that allow them to advocate for themselves and their patients without fear of reprisal.

Sustain and supplement existing well-being programs.

National Level

Allocate federal funding to care for clinicians who experience physical and mental health effects of Covid-19 service.

Allocate federal funding to set up a national epidemiologic tracking program to measure clinician well-being and report on the outcomes of interventions.

for nurses surveyed after the 2011 Fukushima Daiichi nuclear disaster, who described the emotional turmoil of being forced to choose between protecting themselves and their loved ones and doing their duty as caregivers during a national crisis.[4]

The inability to do their duty may be at the heart of the moral distress experienced by Covid-19 clinicians. With overwhelming numbers of seriously ill patients and shortages of essential supplies, providing the optimal standard of care becomes a mathematical impossibility. People who feel that they are called as healers in the altruistic Hippocratic tradition must stand by powerlessly as their patients sicken and die — a tragedy that can cause serious moral injury. Such injury may be most acute and long lasting in the young physicians, nurses, and other health professionals serving on the front lines during their formative years of training.

How should health systems respond to such a formidable challenge? Many organizations have already created a chief wellness officer (CWO) position at the highest executive level. As a first immediate action at the organizational level, CWOs should be given a powerful voice in "command centers" or decision-making bodies that their organizations have assembled to respond to the pandemic. Furthermore, organizations can sustain and supplement existing well-being programs, which can also provide a "playbook" for groups that have yet to bring such programing online (https://nam.edu/clinicianwellbeing/case-studies). Although Covid-19 presents a monumental "excuse," now is not the time to divert resources from clinician well-being or delay the establishment of new activities.

As a second immediate action, organizations can empower and encourage clinicians to speak freely about the stressors they face and to advocate for their own health as well as that of their patients. This effort might include the use of anonymous hotline systems to allow clinicians to voice their concerns without fear of reprisal. For such systems to be meaningful, leaders must be prepared to respond transparently and proactively to feedback.

The final set of actions will have to be taken by the U.S. Congress. Our clinician workforce is an exhaustible national resource, and it is already stretched to the breaking point in many locations. The Covid-19 crisis comes as a blow to a population already at heightened risk for psychological distress and mental health problems. Even before the pandemic, alarmingly high numbers of health professionals were suffering from burnout — according to some studies, as many as 45 to 55%. Burnout is associated with higher rates of anxiety disorders, depression, substance abuse, and suicidality — trends that will be aggravated by the pandemic. And the cost for clinicians will become a cost for patients, as sick and burned-out caregivers leave the workforce at a time when they're desperately needed.[5] We need a national solution that acknowledges the scale of the crisis, and we cannot afford to wait.

The Coronavirus Aid, Relief, and Economic Security Act and follow-on legislation appropriated billions of dollars to support hospitals, health systems, and providers in bearing the financial costs of the pandemic. Although they represent an important start, these funds are unlikely to cover the projected losses of these institutions — let alone meet the enormous need to care for Covid-19 clinicians experiencing long-term physical and mental health consequences. We face the paradox of ongoing activity of the virus, even as institutions begin to furlough employees in response to the economic ramifications of the pandemic for our health care delivery system.

The September 11 attacks again provide a useful comparison. Confronted by chronic conditions such as post-traumatic stress disorder among 9/11 first responders, Congress established the federal World Trade Center Health Program, which provides medical monitoring and treatment for nearly 78,000 responders and 24,000 survivors. The number of clinicians experiencing long-term harms from the Covid-19 pandemic is likely to be much greater. As Congress considers additional pandemic-related appro-

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priations, we advocate inclusion of specific funding for the well-being of clinicians affected by the pandemic, similar to the fund established for World Trade Center first responders.

Another urgent need is for a national epidemiologic tracking program to measure clinician well-being during and after the Covid-19 crisis. Ideally, such a program would be led by the Centers for Disease Control and Prevention and would use random sampling and standardized instruments to assess acute and long-term effects of Covid-19 service on clinicians. Robust data are essential to understanding the scope of the challenge and to reporting the outcomes of interventions. Here, too, congressional appropriations could set the wheels in motion.

The Covid-19 crisis has revealed with painful clarity the fraying threads of the U.S. clinician workforce. Repairing the fabric will take all of us. Clinician well-being is a complex systems issue with multiple responsible parties, including employers, professional associations, insurers, quality-improvement organizations, and state and federal government. The National Academy of Medicine's Action Collaborative on Clinician Well-Being and Resilience offers a wealth of actionable resources to support the development of well-being–focused programs and policies across sectors. There has never been a more important time to invest in the clinician workforce.

We have a brief window of opportunity to get ahead of two pandemics, the spread of the virus today and the harm to clinician well-being tomorrow. If we fail, we will pay the price for years to come. In the race to respond to the Covid-19 crisis, we must not neglect to care for those who care for us.

Disclosure forms provided by the authors are available at NEJM.org.

From the National Academy of Medicine (V.J.D.), the NAM Action Collaborative on Clinician Well-Being and Resilience (V.J.D., D.K., T.N.), and the Association of American Medical Colleges (D.K.) — all in Washington, DC; and the Accreditation Council for Graduate Medical Education, Chicago (T.N.).

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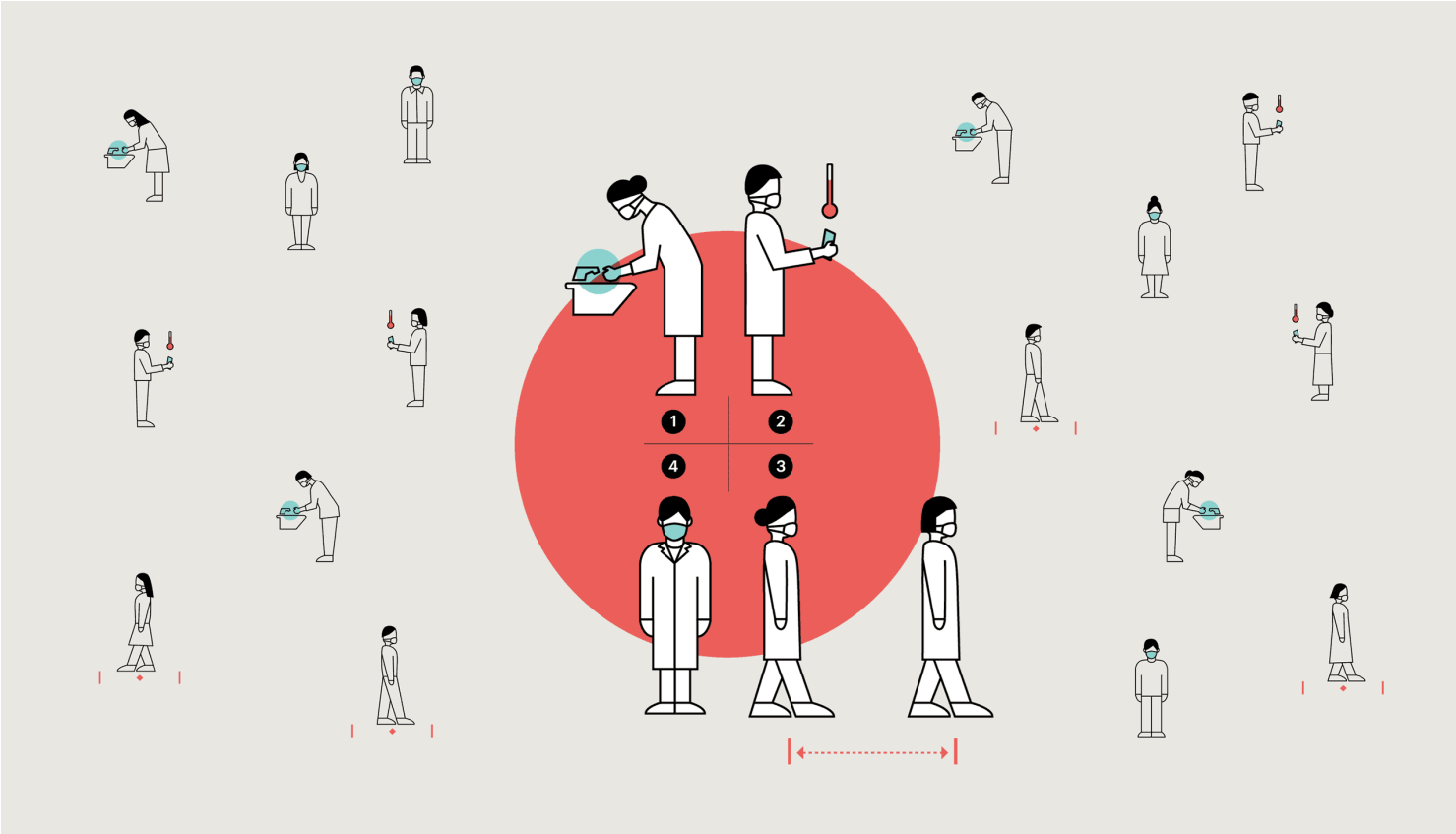

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MEDICAL DISPATCH

AMID THE CORONAVIRUS CRISIS, A REGIMEN FOR REËNTRY

Health-care workers have been on the job throughout the pandemic. What can they teach us about the safest way to lift a lockdown?

By Atul Gawande

May 13, 2020

In places around the world, lockdowns are lifting to various degrees—often prematurely. Experts have identified a few indicators that must be met to begin opening nonessential businesses safely: rates of new cases should be low and falling for at least two weeks; hospitals should be able to treat all

coronavirus patients in need; and there should be a capacity to test everyone with symptoms. But then what? What are the rules for reëntry? Is there any place that has figured out a way to open and have employees work safely, with each other and with their customers?

Well, yes: in health care. The Boston area has been a COVID-19 hotspot. Yet the staff members of my hospital system here, Mass General Brigham, have been at work throughout the pandemic. We have seventy-five thousand employees—more people than in seventy-five per cent of U.S. counties. In April, two-thirds of us were working on site. Yet we've had few workplace transmissions. Not zero: we've been on a learning curve, to be sure, and we have no way to stop our health-care workers from getting infected in the community. But, in the face of enormous risks, American hospitals have learned how to avoid becoming sites of spread. When the time is right to lighten up on the lockdown and bring people back to work, there are wider lessons to be learned from places that never locked down in the first place.

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

These lessons point toward an approach that we might think of as a combination therapy—like a drug cocktail. Its elements are all familiar: hygiene measures, screening, distancing, and masks. Each has flaws. Skip one, and the treatment won't work. But, when taken together, and taken seriously, they shut down the virus. We need to understand these elements properly—what their strengths and limitations are—if we're going to make them work outside health care.

Start with hygiene. People have learned that cleaning your hands is essential to stopping the transfer of infectious droplets from surfaces to your nose, mouth, and eyes. But frequency makes a bigger difference than many realize. A study conducted at a military boot camp found that a top-down program of hand washing five times a day cut medical visits for respiratory infections by forty-five per cent. Research on the 2002 SARS coronavirus outbreak found that washing hands more than ten times a day reduced people's infection rate by even more. Disinfecting surfaces helps, too, and frequency probably matters, although I haven't found good research on this. The key, it seems, is washing or sanitizing your hands every time you go into and out of a group environment, and every couple of hours while you're in it, plus disinfecting high-touch surfaces at least daily.

That is not enough, however, because environmental transmission may account for as little as six per cent of COVID-19 infections. SARS-CoV-2, the virus that causes COVID-19, spreads primarily through respiratory droplets emitted by infected people when they cough, sneeze, talk, or simply exhale; the droplets are then breathed in by others. (Loud talking has even been shown to generate measurably more droplets than quieter talking.) This is why physical distancing is so important. We have all now learned the six-foot rule for preventing transmission of contagion-containing droplets. In my hospital system, observers gently remind us to stand the prescribed distance apart on escalators and in the elevator line; we allow no more than four people on elevators that used to carry more than twenty (a nightmare at shift changes). We've turned as many internal meetings, patient visits, and team huddles as possible into video meetings, even if someone is right across the hall. When we can't avoid face-to-face encounters, we've put up Plexiglas barriers and spaced our chairs and work stations farther apart.

The six-foot rule isn't some kind of infectious-disease law, however. There's no stop sign at six feet that respiratory droplets obey. Public-health guidelines, in fact, originally set the at-risk distance at three feet or less, based on theoretical models going back to the nineteen-thirties, simulation studies, and experience in previous outbreaks, such as a 1981 outbreak of infectious meningitis in a Texas elementary-school classroom. That outbreak began in a cluster of five girls seated together on one side of the room. One infected the other four. Investigators later took measurements: the distance from one girl's seat to another was about two and a half feet. Close contact at lunchtime spread the *Meningococcus* bacteria to other children, who transmitted the disease in their classrooms. In all, thirty-one children became ill or were carriers, and the spread was mainly in two classrooms where the chair-to-chair distance was three feet or less.

Even then, it was already apparent that respiratory illnesses frequently travel farther. Past guidelines from the C.D.C. also cited a 1948 military study in which almost fifty young men with confirmed *Streptococcus* infection—strep throat—were asked to cough, sneeze (with the help of a sneezing powder), and talk. Petri dishes and air samplers were placed at various distances to capture bacteria. All three activities dispersed contagion. Sneezing was the worst.

A study conducted at a naval base in the nineteen-forties found that germs were most commonly collected within a foot and a half of the sneezing subject, but in some cases they could travel much farther.

In the most common pattern, bacteria grew only on petri dishes placed on the floor a foot and a half from the sneezer. In ten per cent of cases, bacteria were captured only by the air samplers. In twenty per cent, no streptococci were recovered anywhere. But one recruit spewed large quantities of bacteria into petri dishes and air samplers almost ten feet away. “This subject,” the report noted, “was really an unusually good atomizer.” They’d caught him at a time of particular infectivity. A few days later, he wasn’t nearly as infectious anymore.

It has now become well recognized that, under the right conditions of temperature, humidity, and air circulation, forceful coughing or sneezing can propel a cloudburst of respiratory droplets more than twenty feet. Yet it wasn't until the SARS epidemic in 2002, after several cases documenting more distant spread, that authorities doubled the at-risk distance from three to six feet. In one case, a man with SARS on a three-hour flight from Hong Kong to Beijing infected twenty-two people, five of whom died. The twenty-three passengers in the same row or the three rows in front of the index patient bore the highest risk: eight fell ill. So did the flight attendant for the patient's section. Extending the recommended distance made sense. But six feet was simply a choice guided by practicality. People seven rows away—around eighteen feet—developed SARS, too.

We've seen similar events in the current pandemic. Take, for instance, the now infamous Skagit Valley Chorale practice, on March 10th, at a church in Washington State. It was pre-lockdown, but there'd been enough coronavirus news to lead the group to suspend their usual hugs and handshakes and to sit farther apart than usual. According to choir members who were present, no one seemed ill at the start of the rehearsal. No one coughed. The singing was as powerful as ever. And that may have been the problem. There was an index patient who had been experiencing cold-like symptoms for three days, which worsened after the rehearsal and led to a diagnosis of COVID-19. According to an investigation by the Skagit County Public Health department, fifty-two of the sixty other choir members in attendance subsequently fell ill. Thirty-two choir members tested positive for COVID-19. Two died.

COVID-19 isn't actually crazy infectious. Measles is crazy infectious: for instance, in a 2008 outbreak in San Diego that began in a school where thirty per cent of students were unvaccinated, each infected child spread the virus to, on average, eighteen others—meaning that the disease has a "reproductive ratio," or R0, of eighteen. By comparison, a person with COVID-19 will infect, on average, only two to three others out of all the people he or she encounters while going about ordinary life. Exposure time matters: we don't know exactly how long is too long, but less than fifteen minutes spent in the company of an infected person makes spread unlikely. (For instance, among four hundred and forty-five people who were within six feet of a COVID-19 case for ten minutes or more, only two tested positive, both of whom had confirmed cases in their households.) But an R0 of two or three is more than enough to cause a pandemic. Given an average incubation period of five days, a single unchecked case can lead, over two months, to more than twenty thousand infections and a hundred deaths. The

six-foot rule goes a long way to shutting down this risk. But there are clearly circumstances where that is not sufficient. At the right point in the illness, under the right environmental and social conditions, one person can produce a disaster. In ninety minutes of choir practice, in a crowded church on a March day, with a woman at the height of infectivity, the R0 was in the dozens.

Hence the practices begun in Asia, and adopted by my health system, to institute daily screening of all employees, patients, and visitors for symptoms of COVID-19. Any time I want to enter a hospital building, I have to go to a Web site that I've bookmarked on my phone, log in with my employee identification, and confirm that I have not developed a single sign of the disease—a new fever, cough, sore throat, shortness of breath, loss of taste or smell, or even just nasal congestion or a runny nose. (Administrators could also have added a formal temperature check with an infrared touchless thermometer, but, although ninety per cent of symptomatic COVID-19 patients eventually develop fevers, early on, fever is present less than half the time. So it's the mild symptoms that are most important to screen for.) A green pass on my phone indicates no symptoms and grants me access to the hospital. Otherwise, I can't work. In that case, the Web site directs me to call our occupational health clinic and arrange for possible testing.

Testing when people have symptoms is important; with a positive result, a case can be quickly identified, and close contacts at work and at home can be notified. And, with a negative result, people can quickly get back to work and keep the hospital going. (Owing to false-negative test results, you are still required to wait until your fever has been resolved, and your symptoms have improved, for seventy-two hours.) Tests for people with symptoms are becoming increasingly available; this is no longer a problem for our hospital. Without these tests, people with symptoms have to self-quarantine for much longer—for at least seven days from the start of their symptoms and until they've been fever-free and with improving symptoms for seventy-two hours.

This self-screening is obviously far from foolproof. Anyone could lie. Nonetheless, in the first week of rollout, more than five hundred colleagues indicated through the Web site that they had symptoms. Through the first week of May, symptoms, often mild, prompted more than eleven thousand staff members to stay home and receive testing. Fourteen hundred of them tested positive for SARS-CoV-2 and avoided infecting patients and colleagues. Daily check-ins are equally important for less measurable reasons: they send the right message. Embarrassingly, people in health care have often

seen calling in sick as a sign of weakness. Screening has changed that. Toughing it out is now a shameful act of disloyalty.

Even the most scrupulous check-ins, however, can do only so much in this pandemic, because the SARS-CoV-2 virus can make people infectious *before* they develop symptoms of illness. Studies now consistently indicate that infectivity starts before symptoms do, that it peaks right around the day that they start, and that it declines substantially by five days or so. This is the pattern we see in influenza. But it's the opposite of the pattern we saw with the coronavirus that caused China's SARS outbreak eighteen years ago. That virus had a low risk of transmission until after five days from the onset of symptoms, which made it easier to identify and isolate cases before others got infected. No large-scale lockdown was necessary. It seems that there are also plenty of people who are infected by the virus that causes COVID-19 who never become symptomatic, especially children. So far, studies of transmission networks have not revealed such silent carriers to be a major source of spread. Nonetheless, patients who do not yet show symptoms, or have just begun to, are turning out to be important vectors of disease.

That's why we combined distancing with masks. They provide "source control"—blocking the spread of respiratory droplets from a person with active, but perhaps unrecognized, infection. Since March 25th, my hospital system has required all employees to wear disposable surgical masks. In early April, we began providing masks to all patients on-site. Patients pose a more controlled risk: they don't come and go every day. As cases have become widespread in the community, however, staff have been at increased risk of picking up the virus at home and then spreading it to patients and colleagues.

So how effective are surgical masks? A study published in *Nature* last month shows that, if worn properly and with the right fit, surgical masks are effective at blocking ninety-nine per cent of the respiratory droplets expelled by people with coronaviruses or influenza viruses. The material of a double-layered cotton mask—the kind many people have been making at home—can block droplet emissions, as well. And the SARS-CoV-2 virus does not last long on cloth; viral counts drop ninety-nine per cent in three hours. Cloth masks aren't as breathable as surgical masks, though, and that's important.

Surgical masks are made of a melt-blown polypropylene fiber fabric, which, under magnification, looks like cotton candy. Most of the filtration this material provides isn't from direct blockage but from an electrostatic charge applied to the fiber using a machine called, aptly enough, a corona charger. The static electricity captures viral particles the same way that a blanket in the dryer catches socks. This allows the material to breathe more freely. Cloth masks feel warm and smothering by comparison, and people tend to loosen them, wear them below their noses, or take them off more frequently. The fit of improvised masks is also more variable and typically much worse. A comparison study found that surgical masks did three times better than homemade masks at blocking outward transmission of respiratory viruses.

Don't ditch your T-shirt mask, though. A recent, extensive review of the research from an international consortium of scientists suggests that if at least sixty per cent of the population wore masks that were just sixty-per-cent effective in blocking viral transmission—which a well-fitting, two-layer cotton mask is—the epidemic could be stopped. The more effective the mask, the bigger the impact.

Cloth and surgical masks do not fit tightly. You can breathe air coming in around the sides. They are designed to safeguard others, not the wearer. The basic logic is: I protect you; you protect me. Benefit to the wearer may be limited, but it's likely not insignificant: laboratory research has found that surgical masks reduce inhalation of respiratory-droplet-size particles by about three-quarters. Two-layer cotton masks filter about half as much on average, though a good fit can improve that considerably. Masks also prevent wearers from touching their noses and mouths. In a study of the SARS epidemic in Hong Kong, people who wore masks in public frequently were half as likely to become infected by the SARS coronavirus as those who didn't.

There are masks specifically designed to not only protect others but also protect the wearer from infection: N95 respirators. These are masks that are designed to fit tightly around the nose and mouth, so that the air you breathe comes entirely through the mask, not around it. They use a filter material with a higher electrostatic charge that blocks at least ninety-five per cent of airborne particles as small as 0.3 microns. I protect you *and* I protect me. If we had an unlimited supply of N95s, all health-care workers would wear them—indeed, lots of people would. But supplies are scarce even in

hospitals, so we reserve N95s for respiratory therapists, intensive-care staff on COVID-19 units, and other clinicians whose work exposes them to high levels of airborne SARS-CoV-2.

Even N95s aren't foolproof. The seal around the face is often imperfect. Your eyes remain a portal of entry for SARS-CoV-2, too. And breathing through an N95 all day is uncomfortable. Talking and being heard while wearing one is a challenge. So people usually prefer to use them for limited periods of time. There's a more comfortable but more sinister N95—the N95 with a valve. The valve makes exhalation easier by getting rid of outward filtration: I protect me; I expose you. These masks are designed for people working in industrial settings where the protection is against dust or asbestos, not viruses. Some cities have, rightly, banned the use of those masks during the pandemic.

Evidence of the benefits of mandatory masks is now overwhelming. Our hospital system would not be able to stop viral spread without them. But will supplies keep up? Factories are increasing production of both surgical masks and N95s as rapidly as possible, but they don't come close to meeting health-care workers' needs, let alone supplying the general public, and they won't for months to come. It should therefore be no surprise that foreign factories have prioritized meeting their own countries' needs, often under government edict, and the world is fighting over what's left.

In order to stretch our supplies, our hospital now limits workers to just a mask a day. We've also found ways to decontaminate masks for reuse. That hasn't been easy: if a disinfectant gets a mask wet, the electrostatic charge is lost. A major breakthrough was the development of a hydrogen-peroxide decontamination system by Battelle, a nonprofit research institute in Columbus, Ohio. Battelle's machine creates hydrogen-peroxide vapor that, testing shows, maintains mask filtration, potentially for up to twenty cycles. The costs run to more than three dollars a mask—too much for regular surgical masks, but acceptable for N95s. And the system can decontaminate eighty thousand N95s a day, enough for high-risk health-care workers in hospitals across our entire region. The cleaning system consists of six, air-tight twenty-foot shipping containers. One of them now sits in a parking lot in a Boston suburb.

Domestic production of masks in the U.S. has been delayed by inadequate federal support and coördination, but it is nonetheless ramping up. For instance, Joanna Newton, a pediatric hematologist and oncologist, spearheaded a collaboration among a group of institutions—including ExxonMobil, NASA, and Georgia Tech's Global Center for Medical Innovation—to reduce the bottlenecks in the

supply chain and create reusable N95 masks. She explained to me that although American production of medical masks has largely shifted abroad, the melt-blown-fiber fabric is produced domestically for lots of other things: diapers, air-conditioning filters, disinfectant wipes, vacuum-cleaner bags, acoustic insulation in automobiles. Her coalition has persuaded several idled manufacturers to help churn out mask fabric. That has required costly investments in retooling and training, but they're now producing enough material for a hundred and twenty million face masks per month.

My hospital system's four-part combination strategy has been in place for a month and a half, and we have increasingly strong evidence that it works. Michael Klompas, my hospital's leader for infection prevention, tracks all new COVID-19 diagnoses among admitted patients. (We've averaged more than a thousand suspected and confirmed COVID-19 patients a day for most of the past month.) The patients he worries about most are those who are diagnosed more than four days after admission for unrelated complaints, and who haven't had any cases in their households, suggesting that they could have been infected *in* the hospital. "I can count those patients on one hand," he said. Every health-care worker who gets infected is extensively interviewed. Many have an unknown source. But when there is an identified source, it is overwhelmingly in the community, usually the family, he said. "We certainly have a subset of cases that we can attribute to a patient or a co-worker. Those cases are diminishing."

In tracking our health-care workers who have tested positive, Klompas has looked for correlations with high-risk hospital assignments, and he's found none. What seems to matter isn't where you work in the hospital—say, in the COVID-19 unit—but where you live. Workers who test positive are more likely to have a home Zip Code in known hot spots—such as Chelsea, a town across the river from Boston, where intergenerational housing is common and where random testing has found a thirty-per-cent infection rate.

The four pillars of our strategy—hygiene, distancing, screening, and masks—will not return us to normal life, but, when signs indicate that the virus is under control, they could get people out of their homes and moving again. As I think about how my workplace's regimen could be transferred to life outside the hospital, however, I have come to realize that there is a fifth element to success: culture. It's one thing to know what we should be doing; it's another to do it, rigorously and thoroughly.

My eighty-three-year-old mother lives in a senior-living community called Lasell Village, not far from my home. It has two hundred and fifty residents, nearly two hundred staff members, and three levels of care, from independent living to twenty-four-hour skilled nursing. Initially, the leadership implemented three of the four measures of the plan used at my hospital: hygiene, distancing, and screening. They put up hand-sanitizer dispensers and secured enough disinfectant to wipe down every door handle and high-touch surface multiple times per day. They banned family visitors (like me) and asked residents to stay in their apartments or in outdoor walking spaces. The dining room was closed, and meals were delivered to residents' doors. Temperature and symptom checks were instituted at the entrance for all, which resulted in many personnel going into self-quarantine.

But it was not enough. An outbreak occurred in a housing unit for disabled residents. Four of the eight residents there became infected, possibly by a staff member who subsequently tested positive for COVID-19. All four died. The week that my health system mandated masks, Lasell Village began requiring its staff to wear them, too, although because of a shortage of surgical masks, most employees got only one per week, plus a backup cloth mask. A few days later, residents and local nonprofits had sewed enough cloth masks to distribute one to every resident, as well.

"I wake up every night worrying," Anne Doyle, the president of Lasell Village, told me. "The tiniest little decisions have consequences"—such as how to triage the dwindling supply of hand sanitizer. But the worry that keeps Doyle up most nights isn't logistics, she told me, though they are an unending struggle. It's culture—how people live and work together every day.

In hospitals, we have had to learn how to bring the stringent antiseptic standards of the operating room into the professional culture of other parts of our institutions. This requires absorbing the detailed practices that keep us from transmitting germs in a given setting—like the rule at the operating table that, once you're scrubbed in, you never let your hands fall below your waist. Even more, this requires developing norms about how to address lapses in rules, so you can comfortably call one another out when you see a standard slipping and still enjoy working together. This isn't simple; I've seen surgical colleagues in the hallway pop their masks down below their noses to talk, which they never would have done across an operating table, yet I am hesitant to call out the lapse.

Culture is the fifth, and arguably the most difficult, pillar of a new combination therapy to stop the coronavirus. People tend to focus on two desires: safety and freedom; keep me safe and leave me

alone. What Doyle says she needs her people—both staff and residents—to embrace is the desire to keep others safe, not just themselves. She needs them to say, "I'm worried about my sore throat, and I am going to stay home." Or "I am O.K. with being reminded to pull my mask up." That is the culture of the operating room. It's about wanting, among other things, never to be the one to make someone else sick.

At Lasell Village, Doyle is doing what she can to create cultural change under pressure. She has made sure that all her staff has enough paid sick time. "Most people have a ton of sick days. For those who don't, we make it clear that we'll top up whatever they have in order for them to adhere to precautions around the coronavirus," she said. She's worked to foster an atmosphere in which everyone will take a runny nose seriously. Residents, however, often have outside aides. When it became clear to Doyle that these aides weren't necessarily getting adequate support, she had her team track them down, and made sure they had masks and training. In March, feeling flu-like symptoms, Doyle set an example by putting herself into self-quarantine. Her symptoms worsened, and it was a full three weeks until she was able to be tested and to return to work.

Every day, there's a new problem to solve, and she asks employees and residents alike to figure out how to rise to the challenge. "When you have a community that cares about each other, then people are interested in adhering [to the guidelines] for other people," Doyle told me. All the effort appears to be making a difference. The frequency of cases among residents fell substantially after the initial outbreak. Lasell Village went from five cases per week down to two and then one.

The combination therapy isn't easy. It requires an attention to detail that simply staying in lockdown does not. But, during the crisis, people everywhere have shown an astonishing capacity to learn from others' successes and failures and to rapidly change in response. There is still much more to learn, such as whether we can safely work at less than six feet apart if everyone has masks on (the way nurses and patients do with one another) and for how long. But answers will come only through commitment to abiding by new norms and measuring results, not through wishful thinking.

As political leaders push to reopen businesses and schools, they are beginning to talk about the tools that have kept health-care workers safe. The science says that these tools can work. But it's worrying

how little officials are discussing what it takes to deliver them as a whole package and monitor their effectiveness. On April 24th, as the first states began relaxing restrictions, the *Times* ran a picture of a barber in a suburb of Tulsa, Oklahoma, mask askew, nose poking out, clipping the hair of an unmasked customer. The week before, the county had experienced ninety-one new coronavirus cases and five deaths, an increase from the prior week. The government had no formal plan for surveillance testing to look for early signs of failure. Many leaders didn't even seem interested. President Trump has sought to compel meatpacking plants to stay open, even though thousands of workers have been infected by COVID-19. He has encouraged protesters to flout public-health guidelines, and seems to consider it embarrassing to set the example of wearing a mask—even as the virus became the country's top cause of weekly deaths in mid-April and then penetrated the White House. This is about as far as you can get from instilling the culture of the operating room.

Still, regardless of what model politicians set, more and more people are figuring out how to do what has worked in health care, embracing new norms just as we accepted social distancing. We see proof of a changing culture every time we step out and find a neighbor in a mask. Or when we spend time to make our own fit better. Or when we're asked whether we have any concerning symptoms today. Or when we check to see whether the number of COVID-19 cases in our community has dropped low enough to warrant reëntry. If we stick to our combination of precautions—while remaining alert to their limitations—it will.

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Atul Gawande, a surgeon and public-health researcher, became a staff writer at The New Yorker in 1998.

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The New York Times https://nyti.ms/3cBp2PZ

Hospitals Knew How to Make Money. Then Coronavirus Happened.

Surgeries are canceled. Business models are shifting. Some of the hardest-hit hospitals may close, leaving patients with fewer options for care.

By Sarah Kliff

May 15, 2020

When the top-ranked Mayo Clinic stopped all nonemergency medical care in late March, it began to lose millions of dollars a day.

The clinic, a Minnesota-based hospital system accustomed to treating American presidents and foreign dignitaries, saw revenue plummet as it postponed lucrative surgeries to make way for coronavirus victims. The hospital network produced $1 billion in net operating revenue last year, but now expects to lose $900 million in 2020 even after furloughing workers, cutting doctors' pay and halting new construction projects.

The future offers little relief, at least until the pandemic subsides and the economy recovers. The Mayo Clinic will have to rely more heavily on low-income patients enrolled in the Medicaid program, as others will be hesitant to travel across the country, or the world, for care. "It's uncontrollable," said Dennis Dahlen, the clinic's chief financial officer.

Dennis Dahlen, the Mayo Clinic's chief financial officer, described a shift toward more local patients as foreign visitors drop. Gage Skidmore

The American health care system for years has provided many hospitals with a clear playbook for turning a profit: Provide surgeries, scans and other well-reimbursed services to privately insured patients, whose plans pay higher prices than public programs like Medicare and Medicaid.

The Covid-19 outbreak has shown the vulnerabilities of this business model, with procedures canceled, tests postponed and millions of newly unemployed Americans expected to lose the health coverage they received at work.

"Health care has always been viewed as recession-proof, but it's not pandemic-proof," said Dr. David Blumenthal, president of the Commonwealth Fund, a health research organization. "The level of economic impact, plus the fear of coronavirus, will have a more dramatic impact than any event we've seen in the health care system weather in my lifetime."

The disruption to hospital operations may ultimately leave Americans with less access to medical care, according to financial analysts, health economists and policy experts. Struggling hospitals may close or shut down unprofitable departments. Some may decide to merge with nearby competitors or sell to larger hospital chains. "There is a huge threat to our capability to provide basic services," Dr. Blumenthal said.

Hospitals are losing an estimated $50 billion a month now, according to the American Hospital Association. And 134,000 hospital employees were among the estimated 1.4 million health care workers who lost their jobs last month, data from the Bureau of Labor Statistics shows. Across the country, hospitals reported seeing between 40 and 70 percent fewer patients from late March through early

May, many of them scheduled for profitable services like orthopedic surgery and radiological scans.

The decline affects large, elite hospital systems like the Mayo Clinic and Johns Hopkins — which estimates a loss of nearly $300 million into next year and has adopted cost reductions — as well as suburban hospitals and small rural facilities that were already financially stressed.

Health workers with a patient at the Johns Hopkins Hospital, which estimates a loss of nearly $300 million into 2021. Carlos Barria/Reuters

Lifespan Health, a five-hospital system in Rhode Island, has put off planned construction of a new spine health center. In rural Wyoming, the 12-bed Weston County Health Services hospital has only enough cash available to get through 16 days, half of what it typically kept, and executives are considering closing the emergency room.

Hospitals that treated high numbers of coronavirus patients say they have been hit especially hard, as they had to spend heavily on protective equipment and increased staffing just as their most profitable services were halted. These patients often had long stays in intensive care units, requiring expensive equipment like ventilators and treatment from multiple specialists.

“We began ordering everything at a feverish pace,” said Kenneth Raske, president of the Greater New York Hospital Association. “The costs were sometimes 10 or 20 times normal. We were scrounging all over the world for supplies.”

His organization estimates that, across New York City, large academic medical centers lost between $350 million and $450 million each last month. Unlike hospitals fighting smaller coronavirus outbreaks, they could not furlough workers to offset the decline.

“In terms of taking care of patients, our hospitals did the right thing,” Mr. Raske said. “But the right thing has challenged their ability to continue sustaining themselves.”

The decline in revenue is expected to be especially high among hospitals that have commanded high prices from private health plans, like the Mayo Clinic. Though coronavirus patients make up a small fraction of its patients — about 1,500 in a health system that sees more than a million annually — the global pandemic is upending its finances.

Last year, the clinic generated 60 percent of its $11.6 billion annual patient revenue from privately insured patients and 3 percent from those on Medicaid, according to its annual financial statement. The rest were either covered by Medicare or paid their own costs.

Other hospitals, including those in low-income areas or with less recognizable brands, rely more heavily on Medicaid funds. This includes many academic medical centers in large cities that see a high number of patients from their surrounding neighborhoods.

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At the Johns Hopkins Hospital, a quarter of patient revenue comes from the public program, according to data provided by the nonprofit RAND Corporation. At NewYork-Presbyterian, it accounts for 16 percent of insurer payments.

A nonprofit database shows that Minnesota's private insurers pay the Mayo Clinic $566 for each obstetric ultrasound, approximately five times the Medicaid price. For an echocardiogram, the difference is tenfold. At Mayo Clinic centers in Florida and Wisconsin, according to RAND estimates, insurers pay three to four times the Medicare prices for outpatient care. Similar data for inpatient prices is not publicly available.

The Minnesota-based hospital system promotes its services to well-off patients, delivering quality health care alongside luxury amenities such as hotel-like suites with fluffy bathrobes, private dining rooms and access to chef-cooked meals.

"They've really made a conscious effort to bolster their commercial contracts, and it's a survival strategy," said Lynn Blewett, a professor of health policy and management at the University of Minnesota. "To maintain the quality and the research and the excellence they're known for, they've got to bring in revenue. There isn't a lot of margin, if any, with Medicaid."

More so than most other hospitals, the 131-year-old Mayo Clinic sees a significant number of patients from afar. In a typical year, more than a million patients travel to the system's 21 hospitals from all 50 states and 140 countries. Many are seen at its 2,000-bed Rochester, Minn., campus. International patients generally account for 1.3 percent of hospital patients but closer to 3 percent of revenue because of the complex care they receive, a spokeswoman said.

The clinic has used its past strong earnings to expand services abroad, opening a facility in London last fall, and now building a 741-bed for-profit institution in Abu Dhabi, in the United Arab Emirates.

During the last recession of 2008, nonprofit hospitals saw their Medicaid revenue increase 17 percent, according to the credit ratings firm Moody's, a possible preview of the changes to come in the present downturn.

Minnesota expects to enroll an additional 100,000 residents in Medicaid next year. Nationally, the nonprofit Urban Institute projects between eight million and 15 million new Medicaid enrollments among those losing the private insurance they had through employers. An additional five million to 10 million Americans who lose such plans are expected to become uninsured, and four million to eight million will transition to the Affordable Care Act's individual market plans or other sources of private insurance.

The Mayo Clinic expects to see more publicly insured patients in the second half of 2020, although it has not recorded an uptick yet. Mr. Dahlen, the chief financial officer, said, "We'll probably see a richer mix of locals and people coming from within 100 miles."

Like other large successful health systems, the clinic has strong cash reserves and access to credit markets. It plans to convert its shortfall by dipping into the $10.6 billion reserve of cash and investments it has built up over decades of profitability.

Independent hospitals that already teetered on the edge have less of a financial cushion and are at greater risk of shutting down services or closing altogether.

Kalispell Regional Medical Center in northwest Montana has already seen a 1 percent increase in Medicaid enrollees as patients begin to trickle back into the hospital last month. That shift from private insurance to public insurance represents a loss of $600,000 because of lower reimbursements, said Craig Boyer, the hospital's chief financial officer.

The hospital has experienced steep revenue declines after canceling most surgeries and seeing a 34 percent drop in emergency room visits. Kalispell treated a small number of coronavirus patients, including 37 who tested positive and four admitted to the hospital.

"If you are a patient who was scheduled for a total knee replacement, you might say, 'My knee hurts but I'm still going to put it off while I see what happens,'" Mr. Boyer said. "We know there is a backlog, but we don't know how many people are going to decide this isn't the right time."

Kalispell Regional Medical Center in northwest Montana has seen revenues plummet after canceling surgeries. Hunter D'Antuono/Flathead Beacon

He also worries that a lull in summer travel will depress revenue. His hospital typically sees more patients then as visitors flock to Glacier National Park, 30 miles away. The hospital has received $10.3 million in federal stimulus plans but does not expect that to cover its losses.

In neighboring Wyoming, the 90-bed Campbell County Memorial Hospital, which treated 29 coronavirus cases with no deaths, has also been hit hard.

"The last six weeks have been disastrous for us," said Andy Fitzgerald, the chief executive. "We've taken a 50 percent haircut on our revenue, and it's the best 50 percent: elective surgery, radiology, all the outpatient care that pays for the other services we provide."

Local coal-mining companies, long a pillar of the economy, recently laid off hundreds of workers as global energy demands have declined. Mr. Fitzgerald expects that will mean a surge in the uninsured, who already account for 12 percent of the hospital's patients. Wyoming is among 14 states that do not participate in the Affordable Care Act's Medicaid expansion, which provides coverage to low-income Americans.

“My concern is that there is more of this in our future,” Mr. Fitzgerald said of the layoffs. “The global economy isn’t going to bounce back to full employment. The demand for what we produce here in northeastern Wyoming will probably be depressed for a while.”

His hospital has received $10.1 million from the $72 billion in federal stimulus funds distributed so far to hospitals across the country, which he estimates will offset losses from the past two months but not the higher number of uninsured patients he expects to see in the future.

The Trump administration has earmarked $12 billion in relief funds for hospitals that treated 100 or more coronavirus cases, meant to offset the high costs of caring for patients whose hospital stays could last weeks. Some of that funding will go to Providence Health Systems, which owns 51 hospitals, including the Seattle-area facility that treated the first confirmed coronavirus patient in the United States.

The hospital system has treated 1,200 coronavirus patients, and executives do not yet know whether it will break even on that care. They estimate that, even after accounting for federal stimulus dollars, Providence still lost $400 million in April.

“We have been in this situation much longer, because of Seattle being on the forefront of the pandemic,” said Ali Santore, the hospital system’s vice president for government affairs. “We canceled elective surgeries before there was a government order. We had to see so many patients who required more supplies, isolation and nursing. Our labor costs were through the roof.”