

When Will The COVID-19 Pandemic End?

PRESCOUTER

May 12th, 2020





Major efforts to control the COVID-19 pandemic will not likely end before **2022**

COVID-19 will be with us for at least another 18 months.

As we are already seeing, states and governments will reopen on a much faster timeline, but there will be consequences to this. Outbreaks will continue to plague the economy as social distancing measures are relaxed.

In this report, we'll cover what companies can do sustain, and even grow, in this time. You'll learn about the strategies you can take to position your business to protect your employees and customers. We'll also show you where things stand with regard to vaccine development and herd immunity. While the medical community is making progress at a rapid rate, there is still a long way to go.

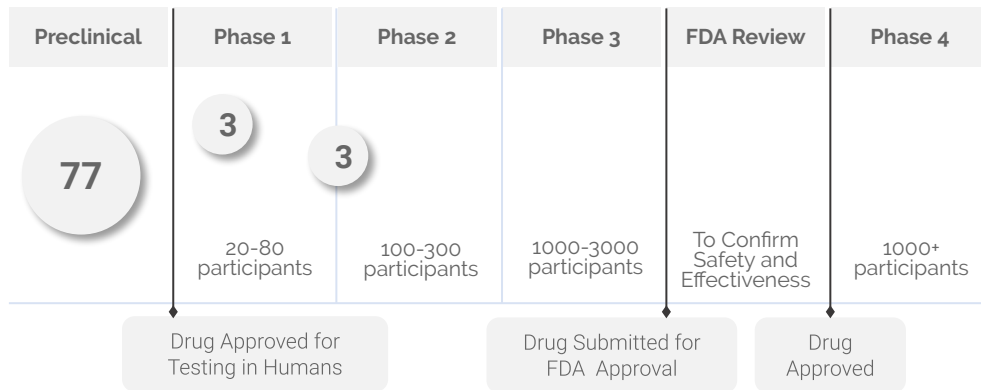
Until there is a vaccine, the virus will continue to spread and threaten healthcare system capacity.

2022 is the earliest that current leading vaccine candidates are expected to be tested and available to the public.

Vaccine development usually takes 10-15 years. By the time it is available to the public, the COVID-19 vaccine will have been developed in under 3 years.

HOW CLOSE ARE WE TO A VACCINE?

Number of COVID-19 vaccine candidates at each clinical trial stage



WHY NOT SKIP THESE PHASES?

In January 1976, a novel "Swine Flu" hit Ft. Dix, NJ. A massive government effort led to a vaccine available for mass consumption. An immunization program was signed into law in April of that same year. However, the vaccine has been linked to patients becoming susceptible to Guillain Barré Syndrome - a disorder in which the immune system attacks the nervous system.



WHAT TO KEEP AN EYE OUT FOR

The furthest along in the clinical process are vaccines from:

- CanSino Biological Inc. / Beijing Institute of Biotechnology
- Moderna Inc.
- Inovio Pharmaceuticals Inc.



PRESCOUTER EXPERT NOTE:

"The only reasonable way to develop an effective herd immunity is to develop a vaccine strategy that, ideally, provides long-term immunological memory."

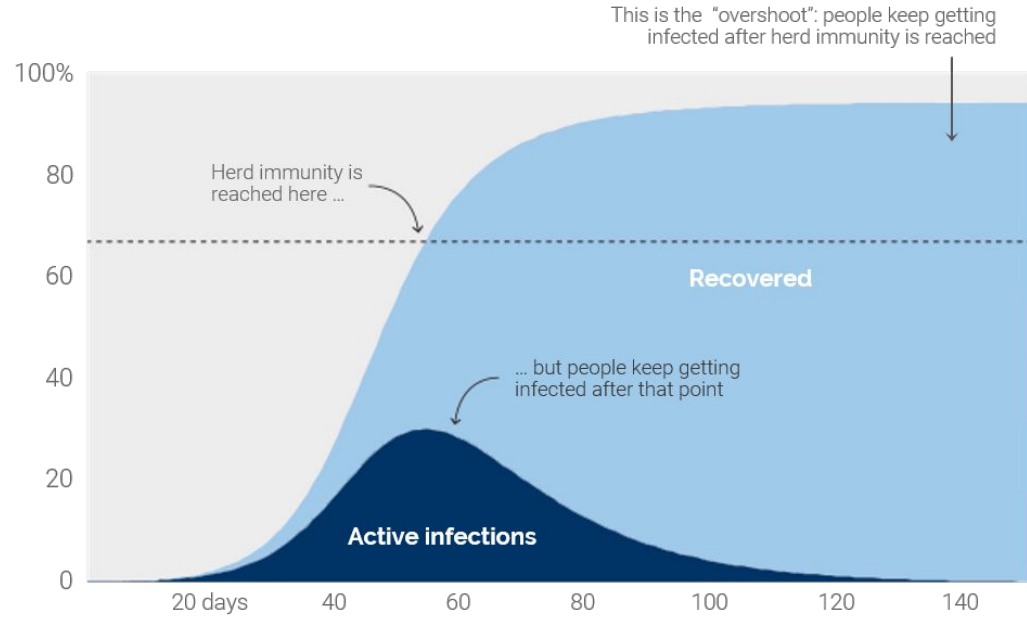
- Makiel Boot, PhD, Researcher, Yale University School of Medicine

The pandemic can also end through herd immunity. But, natural herd immunity will not likely be reached before a vaccine.

When ~70% of the population has immunity, it becomes difficult for the virus to spread. This is called “herd immunity”.

Natural herd immunity will most likely not be achieved because of the proactive lockdown measures governments are taking to slow the spread of the virus. Faster spread would overwhelm the health system.

In the worst hit area in the US - New York City - only ~20% have been infected, far from the 70% threshold for herd immunity. To achieve that level, more than 18,000 had residents died as of May 3rd, 2020.



Source: The New York Times



PRESCOUTER EXPERT NOTE:

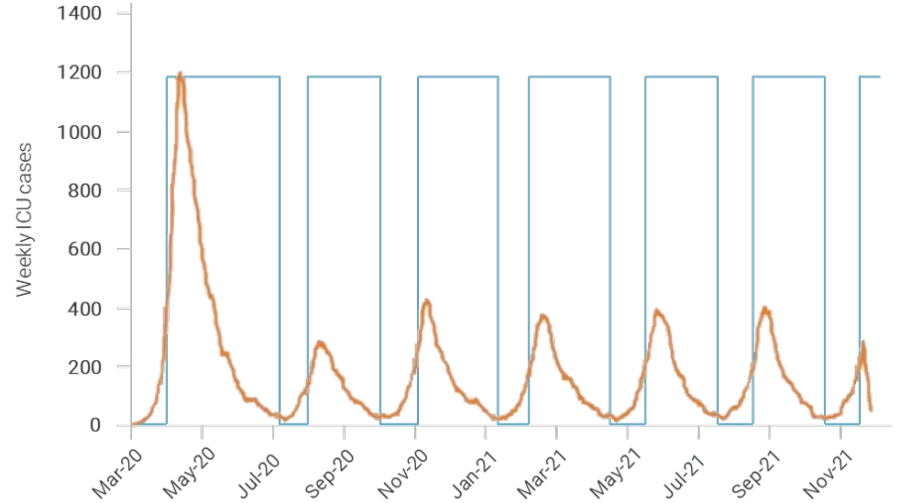
“Natural herd immunity in the United States would require at least 200,000,000 people to become infected with COVID-19. Society would not tolerate this if it were to happen all at once.”

- Jessie Abbate, PhD, Researcher, French National Institute for Development

Until there is a vaccine, countries can expect successive periods of lockdowns and re-openings.

While we all want the world to return to some normalcy, relaxing social distancing will result in more infections.

Until there is a vaccine, we can expect successive lockdowns in waves to prevent spread that will overwhelm hospitals. When hospitals are unable to function, people in need of intervention for both COVID19 and for completely unrelated conditions (such as heart attack, or during childbirth) no longer have access, and may die.



Source: Imperial College London

SECOND WAVES CAN AND WILL OCCUR

Reopening without proper precautions will lead to a second wave of the disease. Hokkaido, Japan lifted its state of emergency on March 19 and had to reimpose a second shutdown just 26 days later. Hong Kong also faced a resurgence of the virus after the initial wave had subsided.

Some treatments are getting media attention, but antiviral drugs and antibody therapies are stop gap measures.

These therapies may extend the periods during which countries and states remain open, but they cannot themselves bring the pandemic to an end. None of the current candidates are safe or easy enough to administer without a diagnosis.

The hope is that treatments will reduce both illness/death and transmission, but none will likely be available without a diagnosis, which often comes only after it has already been spread.



PRESCOUTER EXPERT NOTE:

“Treatment safety is judged by cost-benefit analysis. Are the benefits of taking the drug worth its risks and side effects? Do not take any treatment without consulting your doctor.”

- Stephen Lauer, PhD, Researcher Johns Hopkins School of Medicine



Hydroxychloroquine was found by investigators at Harvard Medical School and Massachusetts General Hospital to not be effective against COVID-19.

- In some cases, the drugs hindered the immune response of patients.



Antiviral drugs are classes of existing FDA-approved drugs used to treat viruses that can be repurposed for COVID-19 therapy.

- Remdesivir is a leading candidate. Early results improved median time to recovery by 4 days and reduced mortality by 31%
- Other more recent results indicate higher adverse events, though it has received Emergency Use Authorization
- It cannot prevent people from becoming infected with the virus



Antibody therapies: Using COVID-19 antibodies from recovered patients to treat or prevent the disease.

- Convalescent plasma therapy can be used to speed recovery time in infected patients.
- Cloned antibodies may provide vaccine-like effects, but only for a very short time
- Regeneron Pharmaceuticals, Bii Biosciences and Vir Biotechnology are all pursuing treatments in this space



What does this mean for companies?

To resume operations, and avoid further lockdowns, businesses need to take responsibility for preventing the spread of the virus.

(Businesses should not rely on governments).

A successful, proactive response to COVID-19 will likely hinge on widespread corporate activity to identify and contain infections, even without a federal or state directive to do so.

If your country or state opens, these same measures will help your business be successful and profitable during the pandemic.



PRESCOUTER EXPERT NOTE:

“If business leaders take COVID-19 seriously, we can establish new standards for hygiene and distancing – keeping the economy open longer than if we rush to 'go back to normal'.”

- Stephen Lauer, PhD, Researcher Johns Hopkins School of Medicine

Business-level policies on **identification** and **containment** can be extremely effective - promoting both public health, and as a result, sales.

With government regulation lagging behind the virus, informed and proactive corporate action can lengthen the periods during which business remain open between lockdowns by helping reduce spread.

This will also prevent a store, factory or office from being the next hotspot. To prevent the spread of the virus, companies need to take responsibility for:



Identification of individuals with active infection, including those who may not show symptoms.

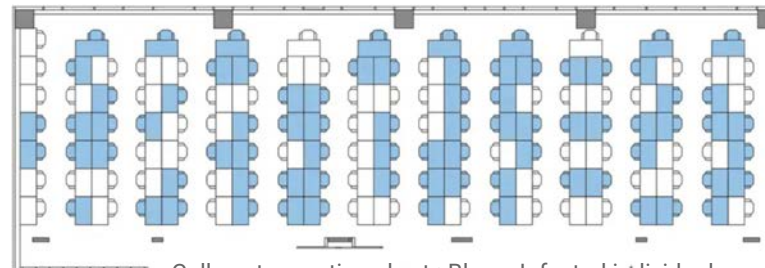


Containment of the virus so it does not spread beyond each infected person.



WORKSPACES CAN BE MORE DANGEROUS THAN HOMES

Workplaces are major sources of disease transmission. 10% of individuals living with an infected person go on to contract the virus. However, in South Korea, 94 of 97 cases in a building all came from workers who shared a workspace in a call center. The exposure rate on that floor was more than 43% (seating chart below)



Call center seating chart : Blue = Infected individuals

Identification is primarily achieved through **screening** to find infected individuals who are symptomatic.

Everyone entering a workplace needs to be checked for symptoms **daily** before being allowed to enter.

Consider using some or all of the following techniques:

- ✓ Temperature checks
- ✓ Thermal / infrared cameras
- ✓ Health questionnaires

Remove personal consequences through offering paid sick leave and assistance with self-isolation, for example. One individual coming to work with COVID-19 can shut down an entire business.

Given tests wrongly show infected results as healthy 30% of the time (“false negative rate”), do not require a positive test for workers to self-isolate. Require employees to stay home until they are fever-free for 72 hours and symptoms have diminished, or have been cleared by medical personnel.



Typical COVID-19 symptoms and a worker being screened.

More formal testing can **identify** cases before symptoms appear, and **confirm** COVID19 diagnoses

Make frequent virus testing available to employees.

Countries that have succeeded at going “back to work” without a resurgence of the virus have adopted regular testing procedures. In many companies, all employees are tested every week.

As soon as you can be sure you will not deprive local health facilities of resources, **buy test kits** and train staff to administer them. Abbott’s ID NOW is one example, but others will become available

Government testing programs will only identify an infection after it has had a chance to spread through your facility.



Diagnostic test: Testing for active viral infection can be done using tests approved by the FDA or equivalent regulatory bodies.

- ✓ In the US alone, more than 50 diagnostic kits have been approved. They may be RNA-based (PCR, more certain) or antigen-based (faster but less certain).
- ✓ Rapid testing kits from Cepheid and Abbott Laboratories can provide results within minutes!
- ✓ Samples may even be pooled to conserve resources.



Antibody test: While immunity testing through antibodies is gaining media attention, there are not enough data yet to prove what levels of antibodies are indicative of immunity to the virus.

- ✓ The FDA has issued 4 emergency use authorizations (EUA) for serological test kits.
- ✓ Watch this space for developments, but know there is much to learn before relying on these tests.



PRESCOUTER EXPERT NOTE:

“Catching cases early is key, before they’ve had a chance to spread. But be sure to understand what a test does and does not tell you!”

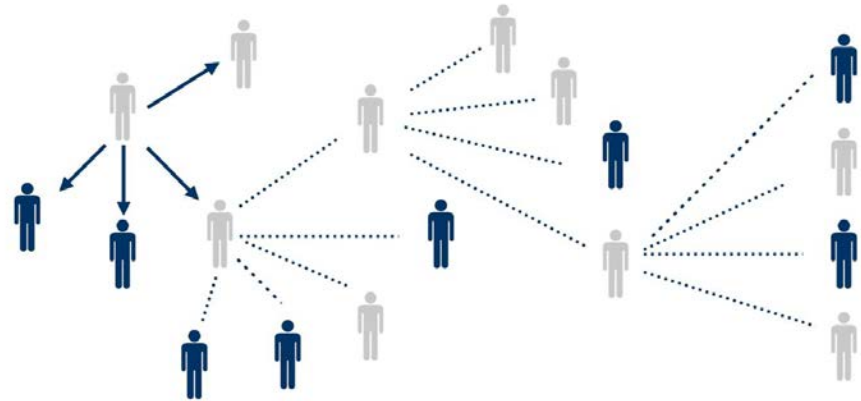
- Jessie Abbate, PhD, Researcher, French National Institute for Development

To **contain** further spread, **contact tracing** should be used to identify everyone potentially exposed to a confirmed case.

Contact tracing methods can help **find and isolate those who have been in contact** with an infected person before they transmit the virus.

Have all team members keep a log of who they have come into contact with. If that team member is later found to be infected, test and/or quarantine everyone who that person has come into contact with over the previous two weeks.

Use technology. **Mandate employees use a contact tracing app or leverage existing technology such as RFID badges, CCTV systems, or shared calendars** to reconstruct on-the-job contact incidents. Encourage this technology for off-the-job contacts, as spread in the wider community will serve as a continued source of new infection in the workplace. Offering tests to anonymous contacts is one way to help preserve privacy.



Rapid, detailed and complete contact tracing can help keep new transmission chains from forming.

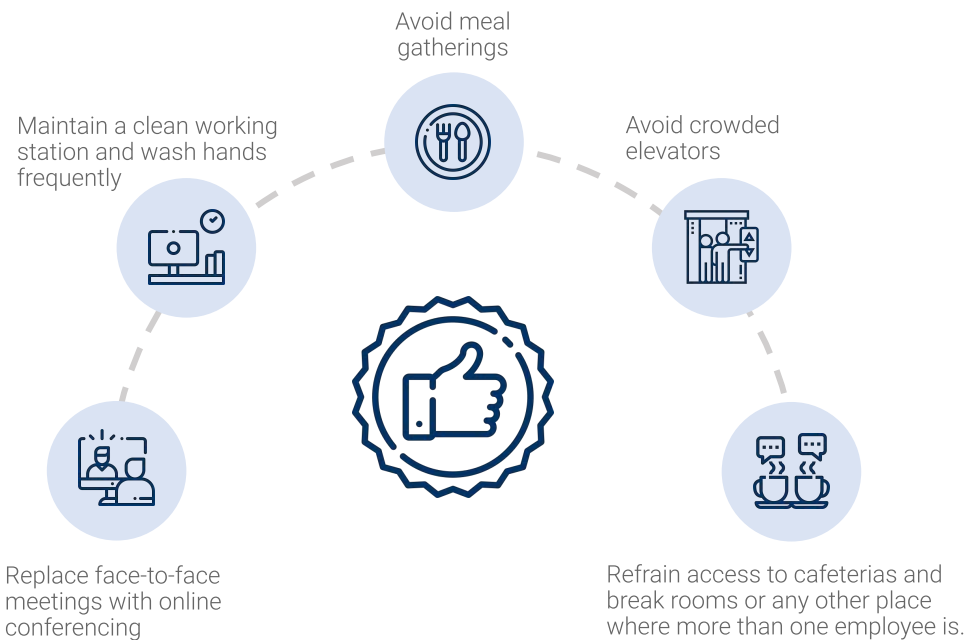


WHAT TO KEEP AN EYE OUT FOR

Google and Apple are implementing contact tracing within Android and iOS. Users will be notified if they have come into contact with someone who has tested positive for the virus. Their approach uses Bluetooth, rather than GPS, to protect the privacy of all individuals.

Continue practicing obvious, recommended guidelines.

- ✓ Follow all public health guidelines in effect.
- ✓ Continuing to maintain social distancing while cautiously heading back to business.
- ✓ Allow employees to work remotely.
- ✓ Install hand sanitizing stations throughout the workplace, including near doors and elevators and other common-touch surfaces.
- ✓ Make the most of limited budgets with low-tech solutions, such as hands-free door openers or encouraging employees to use their elbows to push elevator buttons.
- ✓ Close the break room and remove shared facilities, or limit their access. Recommend bag lunches.



PRESCOUTER EXPERT NOTE:

"Social education on how to slow the spread of COVID-19 is essential to combat this pandemic, until we have medical interventions to block transmission. The challenge is to communicate to all groups in society, regardless of income, race, level of education or location."

- Makiel Boot, PhD, Researcher, Yale University School of Medicine

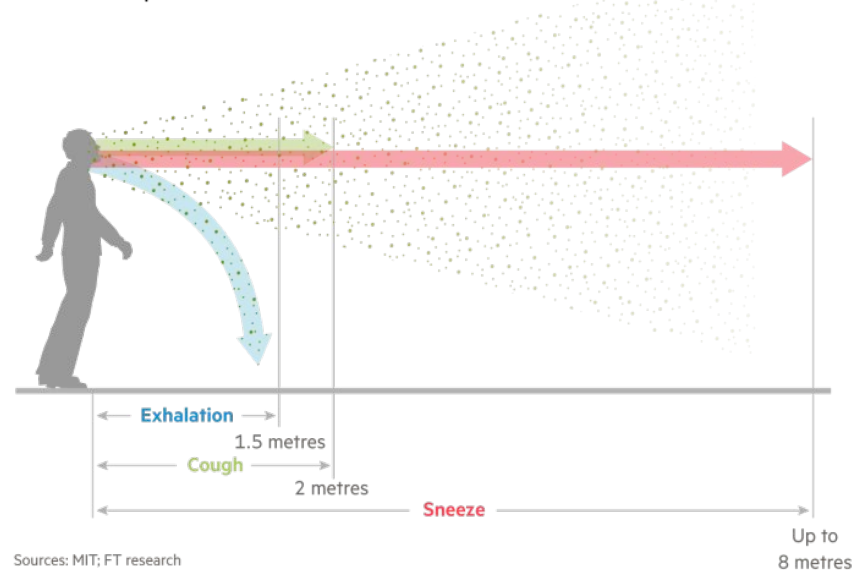
Provide **Personal Protective Equipment (PPE)** to staff and customers to contain the virus.

Many people struggle to make masks and worry about contamination outside the office.

Provide a fresh supply of clean masks and gloves for staff to use, and replenish these masks regularly. **Require wearing masks within the office.**

Don't stock up on N95 masks until the shortage has passed. Medical staff still can't get enough of these supplies, and hoarding them would not make for a good headline.

How far droplets travel



Sources: MIT; FT research
© FT



PRESCOUTER EXPERT NOTE:

"Guidance on proper PPE use for employees is extremely important. Gloves are one of the easiest-to-misuse pieces of PPE. If they are not regularly replaced and cleaned they can contribute to viral spread."

- Ryan LaRanger, PhD, PreScouter Technical Director



NOTE

Be sensitive to employees personal needs. Individuals with latex allergies have reported discomfort with straps on commercially available masks. Provide multiple options if possible. Consider job tasks when deciding if gloves are appropriate (in most cases they are not needed).

Businesses with thoughtful **sanitization** procedures can prevent further transmission

Cleaning and disinfection procedures should be focused on high-touch surfaces. Protect cleaning crews, too. Make sure to provide disposable gloves and other appropriate PPE.

If an individual is infected, use contact tracing to clean all areas that person has been in within the previous 48 hours. Notify co-workers and other exposed individuals to self-isolate.

Don't go overboard. It is not necessary to fumigate offices on a nightly basis.

How long can coronavirus survive on surfaces?

	Maximum time virus survives (in hours)
In the air, e.g. after cough	3
Copper	4
Cardboard	24
Stainless Steel	48
Plastic	72

Conditions: 21 to 23°C and 40% relative humidity

Source: New England Journal of Medicine



What else does your business need to consider?

Depending on the specific activities conducted by your business, further steps may be necessary to minimize viral risk.

(It may be necessary to consult an expert).

Best practices will vary by industry and implementation details can depend on specific aspects of a business - including customer traffic, floorplan and hours of operation.

General guidelines will be given on the next few pages, but expert consultation can quickly turn those action items into specific procedures and protocols for an office, store or manufacturing site.

Not all work is equal. Some tasks and settings have a much **higher risk** of transmitting the virus.

Office work has the lowest risk of transmitting the virus - especially since the past few weeks have shown that much can be performed remotely.

Consider limiting on-site attendance to a few days a week where collaboration is crucial.

Other tasks, like manufacturing and food preparation, can require close interactions and will require extensive mitigation. Industries dependent on mass attendance may need to rethink the business model.

Common Types of Work & Transmission Risk



Office & computer based work

Work that requires shared facilities
(manufacturing, construction, retail)



Close-proximity, personal work
(salons, spas)

Conferences, sports, other mass
gatherings

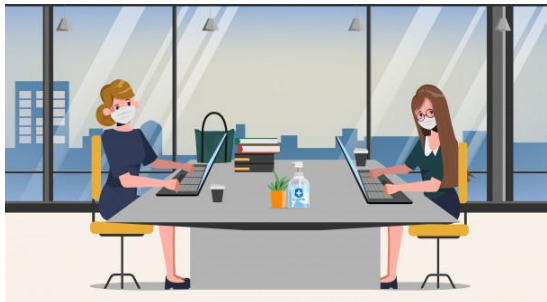


Increasing risk of spreading virus

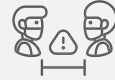
Office work should be kept to a minimum. Work remotely whenever possible.

If it is necessary to work from the office, precautions need to be taken. Limit opportunities for contact between employees and customers.

Establish virtual collaboration and remote work procedures. Use this time to figure out what truly *needs* to be done in person.



*RESIST THE URGE TO RETURN TO NORMAL
WHEN GOING BACK TO THE OFFICE*



Prepare for Staff Return:

- ✓ Restrict access to breakrooms, cafeterias, conference rooms.
- ✓ Space workstations to allow social distancing (6ft) or install plexiglass barriers.
- ✓ Install hand sanitizing stations throughout office



Modify Procedures:

- ✓ Stagger or space shifts to limit number of workers on premises, or the times they arrive and leave
- ✓ Keep the people in physically-interacting teams small and consistent from day to day.
- ✓ Rearrange tasks to limit the number of times objects change hands.



Remove or Sanitize Shared Items:

- ✓ Elevator buttons
- ✓ Coffee pot handles
- ✓ Time clocks
- ✓ Keypads

Restructure manufacturing environments to separate staff. Sanitize regularly and install clear signage with procedures for preventing spread.

Factories in Wuhan, Taiwan and South Korea provide models for production lines with physical separation

Sanitize areas regularly and be ready to temporarily stop production or move work cells if an individual tests positive. Monitor all staff to retrace contacted surfaces.

Remember that people aren't perfect. **Use technology to supplement instructions.** Ford is using buzzing wristbands that will alert employees when they come within 6 feet of one another.

For shipping and receiving areas, minimize traffic, arrange for contactless delivery, use signage to remind workers about safety guidelines, use professional disinfection companies to clean manufacturing floors.



Follow physical distancing by implementing rotating days/shifts, staggering shift start times, keeping small crews, and quarantining entire crews, if needed.



PRESCOUTER EXPERT NOTE:

"Protecting a complex production line from COVID-19 involves many variables. Bring in a fresh set of eyes to make sure to catch the things you might take for granted."

- Jessie Abbate, PhD, Researcher, French National Institute for Development



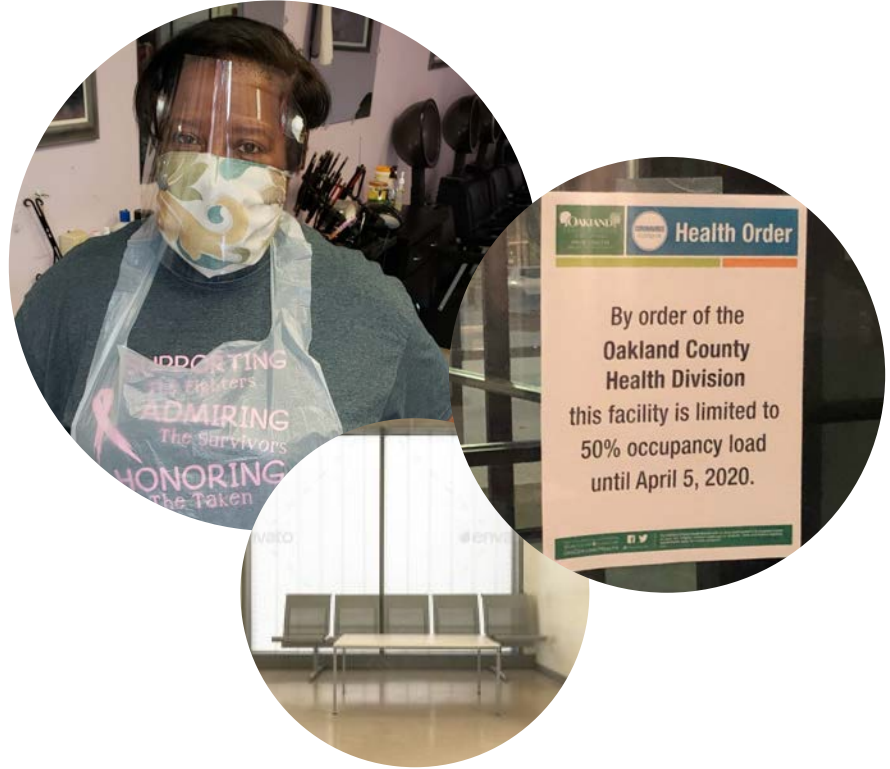
NEED MORE INFORMATION FOR MANUFACTURING?

More comprehensive procedures for manufacturing facilities can be found in the PreScouter whitepaper, [Operating Workplaces During The COVID-19 Pandemic.](#)

Close contact businesses have unique challenges. Use extensive PPE and limit capacity.

Contact between customers and clients is unavoidable. **Don't return to old procedures.**

- ✓ Limit capacity. In salons, seat every other station (50% capacity), and require customers to wait outside.
- ✓ Require customers to wear masks and service providers should wear gloves, masks and face shields
- ✓ Eliminate services like blow drying that can increase airflow and dramatically spread the virus
- ✓ Limit items customers can bring into the establishment - no handbags
- ✓ Eliminate cancellation fees - encourage customers to stay home if they feel sick & check temperatures before admitting into facility
- ✓ Sanitize all equipment between customers



If conferences and mass gatherings cannot be shifted online, dramatic restructuring is needed.

Where gatherings need to occur, venues need to prioritize social distancing and continuous cleaning.

- ✓ Use venues with 30-40% excess capacity, to space out seating.
- ✓ Allow dual attendance: in-person (locals) & online (commuters/travelers).
- ✓ Encourage attendees to carry in food and eliminate onsite food vendors and eating areas
- ✓ No self-service for coffee (have a caterer pre-fill cups or on demand).
- ✓ Provide masks and hand sanitizers; set up temperature checking booths.
- ✓ Replace the handshake!



PRESCOUTER EXPERT NOTE:

"It is essential to invest in developing a diverse set of intervention strategies. Besides vaccines and diagnostic tools, severe **behavior and activity modification** will be essential to cope with COVID-19 from different angles."

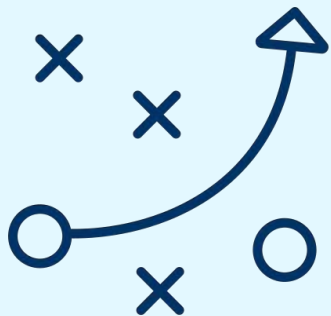
- Makiel Boot, PhD, Researcher, Yale University School of Medicine



PRESCOUTER EXPERT NOTE:

“The development of a vaccine will not necessarily result in a return to normalcy. Depending on how long the vaccine lasts in a patient, there may be a persistent risk of COVID resurgence. Adopting smart operational practices can be worthwhile both for now and the future.”

- Ryan LaRanger, PhD, PreScouter Technical Director



As economies reopen, not all businesses will be hit by COVID-19 equally. **Taking proactive measures can lead to stability and growth - even during a pandemic.**

Adopting a wait-and-see attitude will likely result in a second shutdown within months.

While much has changed between now and then, the 1918 Spanish Flu pandemic provides reason for optimism. Cities and businesses that acted early and aggressively to implement social distancing experienced a relative increase in real economic activity.

Those that did not saw a sharp and persistent decline, even after the pandemic had subsided.

You're an expert at your business, not infectious disease. **Don't be afraid to get some advice.**

- ✓ Following government regulations alone cannot guarantee the safety of patrons and employees.
- ✓ Taking an active role in identifying, preventing and containing COVID-19 is the only way to protect your business
- ✓ The right thing - actions that keep people safe - is also good for business, as it prevents future shutdowns. You don't have to make a choice.
- ✓ Do not assume your situation is synonymous to anything from the past - this is a once-in-lifetime event.
- ✓ **Listen** to epidemiologists and infectious disease experts for advice on best practices to contain the viral spread in the workplace.
- ✓ Ask an expert to review your reopening plans: like you know your business, they know how to prevent the disease.



PreScouter's network contains more than 3,000 subject matter experts and advanced degree researchers from around the world.



BRING IN AN EXPERT

PreScouter epidemiologists and infectious disease experts can help you: interpret news reports, establish policies, review floor plans and staffing arrangements, respond to sick employees, and do whatever it takes to weather the storm.

ABOUT PRESCOUTER

PRESCOUTER PROVIDES EXPERTISE ON DEMAND, INCLUDING EPIDEMIOLOGISTS AND OTHER COVID-19 EXPERTS

During COVID-19, PreScouter is leveraging its network of experts to help clients respond to this pandemic appropriately. Our epidemiologists, infectious disease scientists, and biostatisticians combine advanced technical training with years of consulting experience to distill virology into strategies that make sense for a variety of businesses.

EXAMPLE PRESCOUTER PROJECTS:



Reopening Planning: Experts review and help craft reopening plans, examples of which include:

- Employee testing programs
- Workspace reconfiguration options
- PPE / sanitation / HVAC protocols



Supply Chain Disruption: When traditional resources or raw materials are not available during a pandemic, PreScouter helps clients find alternative solutions - uncovering connections around the world.



Driving Consumer Confidence: Tactics that give workers and consumers confidence that they are in a safe environment, to ultimately drive their re-engagement in economic activity.



Authors



Jessie Abbate

PreScouter Infectious Disease Expert | French National Institute for Development

Jessie is a biologist with deep experience in experimental approaches and modeling transmission of infectious disease in populations. She is currently a researcher in the Translational Research on HIV and Infectious Diseases Laboratory at the French National Institute for Development and an epidemiological data scientist at Geomatys. Jessie has also held research positions at the University of Bern, the French National Research Institute for Agriculture and the French National Center for Scientific Research. She earned her Ph.D. from the University of Virginia, and is an author on more than 24 peer-reviewed publications. As a consultant, Jessie specializes in bringing her real-world understanding of infectious disease dynamics to corporate clients, helping them to anticipate developments and adapt their staffing, logistics, and business operations to the COVID-19 pandemic.



Paromita Raha

PreScouter Advanced Degree Researcher

Paromita is a biotechnologist with a research focus on protein biochemistry, drug discovery, preclinical oncology, and food science. She earned her Ph.D. in Biotechnology from the University of Calcutta followed by postdoctoral research at the University of California, San Francisco. She has worked in the oncology drug discovery space overseeing multiple drug combinations translating to the clinic.

A healthy eater and a strong proponent of sustainable environmental development, she currently leads food science research in a startup aiming to provide easy access to fermented food. Paromita is passionate about researching current technological innovations including market trends in the life and food sciences sector and presenting complex information in a simplified way to a global audience.



Justin Starr

PreScouter Senior Technical Advisor

Justin is a roboticist with a passion for using artificial intelligence to solve real-world problems. As a senior technical advisor, Justin facilitates consultations between corporate customers and PreScouter's network of subject matter experts. Before joining PreScouter, Justin was CTO of RedZone Robotics, where he oversaw the launch of multiple underground inspection robots. He also worked on several DARPA programs for QinetiQ North America's Technology Solutions Group. Justin is also co-founder and CEO of Janus Robotics, a startup using AI and computer vision to detect infectious disease in crowds. He holds 5 U.S. patents in the areas of robotics and automation and is an Assistant Professor of Robotics Technology at the Community College of Allegheny County.

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