

COVID-19 Expert Reality Check

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This scanning electron microscope image shows SARS-CoV-2 (round magenta objects), also known as COVID-19, emerging from the surface of cells cultured in the lab. Image: NIAID-RML

As the media swarms the coronavirus story, most news articles focus on numbers of cases and deaths, new locations of cases, etc.

Lost in the shuffle are the important public health insights about how viruses work and humans respond. To help improve understanding of an emerging outbreak's complex dynamics, GHN has reached out to some of the world's most respected global health experts for their quick "reality checks" on key issues related to the outbreak.

Ed. Note: See the [Johns Hopkins Coronavirus Resource Center](#) for more information and updates.

Virus

How does this particular coronavirus compare with other coronaviruses like SARS and MERS?

"We are learning more about the virus every day. On the continuum of the common cold to SARS, it's now clear that the novel coronavirus is more contagious than SARS, [but less deadly](#). We don't yet know how much more contagious, or how much less deadly. The number of confirmed infections with nCoV has already far outpaced the total number of suspected SARS cases."

[Tom Frieden](#) is President & CEO of Resolve to Save Lives, an initiative of Vital Strategies, and the former Director of the US CDC and Commissioner of the New York City Health Department.

Outbreak

When does an outbreak become a pandemic?

The word pandemic literally means “all people” in Greek. But clearly not all people become sick even in the worst pandemics. Epidemiologists typically mean an infectious disease epidemic that has spread or is spreading globally.

Usually we refer to a pandemic only when it involves a new disease. So, for example, we talk about an influenza pandemic when there is a new strain of flu spreading around the world. In contrast, we do not refer to the global outbreak of seasonal influenza as a pandemic because the strains are not new.

There is no strict definition of when an epidemic becomes a pandemic—but usually it means that the disease is actively spreading on several continents with likely continued spread to other continents.

Eric S. Toner, MD is a Senior Scholar with the Johns Hopkins Center for Health Security and a Senior Scientist in the Johns Hopkins Bloomberg School of Public Health, Department of Environmental Health and Engineering. He is an internist and emergency physician.

What’s a reproductive number and what does it tell us about an outbreak’s future?

The reproductive number is the average number of people that one infected person will infect. The reproductive number for a disease can change based on how infectious the pathogen is, the host population, and environmental factors.

To control an outbreak, the goal is to reduce a disease’s reproductive number to less than 1. If the reproductive number remains 1 or higher, the outbreak will continue. In the case of COVID-19, the [estimated reproductive number is around 2.6](#), meaning the outbreak is expected to continue.

The reproductive number can be lowered by changing the environment—with social distancing, home isolation, quarantine, and use of personal protective equipment in health care settings. Over time as people are infected and recover—or if a vaccine becomes available (which may take months or years)—immunity in the population also reduces the effective reproductive number of a disease.

Michael T. Osterholm, PhD, MPH, is the director of the Center for Infectious Disease Research and Policy (CIDRAP), and a professor for the University of Minnesota’s School of Public Health, College of Science and Engineering, and Medical School. He is also the author of the 2017 book, [Deadliest Enemy: Our War Against Killer Germs](#), and a member of the National Academy of Medicine and the Council of Foreign Relations.

Response

If there are no approved treatments, what can health care providers do?

Even without approved treatments, there are several key ways health care providers can care for people with COVID-19 and keep them alive:

1. Control their symptoms: Give them medications that make having COVID-19 more tolerable—ones that control fever, cough, and other commonly associated symptoms.
2. Provide intensive support to the body of a sick person as their immune system battles the infection: We see that some patients may become critically ill with this disease, hence they may need mechanical ventilation or urgent dialysis. There may be a role for technologies such as extracorporeal membrane oxygenation to help their lungs recover from acute respiratory distress syndrome.
3. Treat other infections that COVID-19 patients may get, such as concurrent bacterial pneumonia because their lungs are not functioning as well as they can. In this case, clinicians will use antibiotics to help them recover.

Nahid Bhadelia, MD, MALD, is the medical director of the Special Pathogens Unit at Boston Medical Center and an associate professor in the Section of Infectious Diseases, National Emerging Infectious Diseases Laboratories, at Boston University School of Medicine.

What should the average person in a non-outbreak area be doing to prepare?

The CDC believes it is likely that COVID-19 will cause a pandemic, but there are steps that the public can take to protect and prepare themselves.

First, it is important to stay informed and follow instructions issued by your local or state health department and the CDC. [Basic infection control measures](#) still apply in this scenario. Practicing good handwashing techniques or using hand sanitizer, avoiding people who are ill, and staying home when you are sick are all effective measures.

A pandemic could interrupt supply chains and result in closures at local businesses, meaning it may be wise to stock reserves of critical supplies. Examples include extra prescription medications, asthma relief inhalers, over-the-counter anti-fever and pain medications, non-perishable food items, household cleaning supplies, and toiletries. However, do not hoard - this could create shortages.

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Can travel restrictions and quarantines slow the spread of the coronavirus?

Travel bans can't keep all cases of the virus out of a country. As the epidemic expands, cases may originate in any number of countries. We may already have unrecognized cases in the US.

Travel bans can actually make us less safe. They can make countries facing restrictions not want to share information about their outbreaks. They can disrupt the distribution of supplies needed to control the epidemic. Similarly, as we saw with the US's Ebola response in 2014, quarantining returning travelers makes doctors and nurses less likely to volunteer to serve in affected countries.

This virus is likely past the point of containment. We need to focus on reducing its impact by speeding the development of diagnostic tools, vaccines, and drugs to treat infections.

Jennifer B. Nuzzo, DrPH, SM, is an epidemiologist with the Johns Hopkins Bloomberg School of Public Health's Center for Health Security.

What are the ethical considerations of using quarantines?

The tools of public health during suspected infectious outbreaks include limits or restrictions on the movement of individual citizens, ranging from travel bans, to closure of businesses and schools, to isolation of individuals in their homes, to forced quarantine in medical facilities.

The goal of these actions during an outbreak is to balance the freedom of individuals against the restrictions on freedom required to reasonably protect the public's health, with public and transparent justification of policy decisions.

Whatever restrictions are used should be the least restrictive to reach the stated public health goals. Quarantine is considered a measure of last resort given the severe restrictions it imposes on individual liberty, and when misused or ineffective can severely undermine trust in government.

Jeffrey Kahn, PhD, MPH, is the Andreas C. Dracopoulos Director of the Johns Hopkins Berman Institute of Bioethics.