

Everyone's asking when the pandemic will be over. Here's how we'll know

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Throughout each day, Cheryl Bettigole receives granular, neighborhood-level updates on the numbers we've all been hearing for months. The percentage of people testing positive for COVID-19. Transmission rates. Hospitalizations, deaths, and progress with vaccines—in Philadelphia and beyond.

The lines on the graphs often bounce around like the stock market. Yet at some point the city's acting health commissioner and policymakers throughout the country have to reduce it all to a pivotal yes-or-no question:

Is it OK to resume life as normal?

"Things are trending in the right direction," Bettigole said last week. "But we're not past COVID."

It is now generally accepted that COVID will always be with us in some form, much like seasonal coronaviruses that cause the common cold. But thanks to vaccines and the lingering immunity that many have acquired through infection, the share of the population protected from severe disease continues to grow.

That trend has infectious disease experts predicting that sometime in the not-so-distant future, perhaps a matter of months, the disease will become "endemic"—still circulating, yet not out of control.

What level is low enough to know we've crossed that line? And who decides what is normal?

It's no secret that plenty of people felt comfortable returning to normal activities months ago—eating indoors at restaurants, going to movies, masks be darned. Even policymakers such as Bettigole, guided by their public-health training to err on the side of caution, have eased up on the toughest, pre-vaccine restrictions.

But with vaccination rates still low in much of the world, the possibility of new variants, and the onset of winter and the flu, they want to make sure we don't slide back in the wrong direction.

What 'endemic' means

More than a year and a half ago, the World Health Organization declared that COVID-19 was a pandemic.

That means an epidemic that has spread across multiple countries, typically affecting large numbers of people. (In that case, WHO made the call when 118,000 cases of COVID had been confirmed in more than 100 countries.)

An epidemic, in turn, is a sudden increase in disease "above what is normally expected" in the population of one country or geographic area, the CDC says. Nothing about COVID was normal. It was brand-new, after all.

Endemic, on the other hand, means a disease has reached a "constant" or "usual" presence, the federal health agency says—in other words, normal. Yet even after all this time, Philadelphia's Bettigole says it is hard to tell what level of COVID will constitute its endemic phase.

In the near future, the threat level may continue to wax and wane as it has throughout the pandemic, she said. And the disease may subside enough in one region for a health department to lift mask requirements and other restrictions, but not in others, Bettigole predicted.

In her office at the Department of Public Health, she keeps a close eye on surrounding counties—noting that the city, while less vaccinated than its neighbors, currently has lower rates of COVID, a trend she attributes to Philly's continued mask requirement.

"I think this could be a little like forest fires," she said. "I think it would be possible to say at a future time when the numbers look good, 'Hey, we don't need to have masks right now, [but] we might in the future.' "

How low is low enough?

We all remember the start of the pandemic, when naysayers described COVID as "just like the flu"—despite clear evidence that its impact was far more severe. Even this year, despite the advent of effective vaccines, close to 400,000 deaths in the U.S. have been attributed to COVID—10 times the typical national death toll each year from the flu.

But if COVID deaths and hospitalizations did eventually reach levels usually associated with the flu, would that be a reasonable benchmark for saying the pandemic was over?

It's not that simple, said Donald F. Schwarz, a former Philadelphia health commissioner who is now a senior vice president at the Robert Wood Johnson Foundation.

With the flu, nearly everyone has some level of baseline immunity, he said. The world is not there yet with COVID.

And unlike COVID, the flu is seasonal, meaning health officials in the northern hemisphere have time to prepare each year based on what flu strains are circulating below the equator, he said. Not so with COVID.

"If there's any [COVID] outbreak in Brazil in the summer, we're all at risk in a way that we would not be with influenza," he said. "A new variant of COVID in any part of the world is a risk to all of us."

In Philadelphia at the moment, 2% of those getting tested for COVID are identified as positive—well below the 5% threshold that epidemiologists say is cause for heightened concern. Bettigole said she would like the city to do even better, reaching a positivity rate below 1%.

But as more people are vaccinated, meaning that fewer people are likely

to become infected and suffer life-threatening symptoms, case counts and positivity rates alone may be less important, she said.

"If our case rate is high and no one's in the hospital, or very few people are in the hospital ..." she said, "if people aren't ending up in the hospital or aren't ending up dying with complications, that might be something we can live with."

What if the flu is bad this year?

The U.S. was largely spared from the flu last winter, a phenomenon generally attributed to all the social distancing and other restrictions that were in place due to COVID.

But some infectious-disease experts have warned flu may come back hard this winter while COVID remains widespread—a so-called twindemic. For those getting a COVID booster, a flu shot is recommended on the same visit.

Herb Conaway, director of the Burlington County Health Department and a New Jersey state assemblyman, is among those cautioning that it is too soon for society to let down its guard.

"We're moving to winter," he said. "That means less outdoor activities, more people huddled together in drier air indoors, more likely to engage in what might be considered high-risk behavior."

If there is a silver lining in the post-pandemic future, he said, more people may choose to be vigilant about hand-washing and other precautions—even masking when not required.

"I think there will be a number of people who will continue to wear masks even when we reach this endemic phase," the physician said.

"They might wear it on the train or on a bus or on a plane, might wear it in other venues where they're huddled close together."

Could new mutations send us backward?

Each month seems to bring a new coronavirus variant somewhere in the world, even as delta retains a strong foothold in the U.S.

The good news is, none of the variants has mutated enough to escape the protection that vaccines provide against severe disease, said E. John Wherry, an immunologist at the University of Pennsylvania's Perelman School of Medicine.

Yes, there have been breakthrough infections in vaccinated people. But that's not because our antibodies and other defenses fail to "recognize" delta, said Wherry, director of Penn's Institute for Immunology.

It's because our antibody levels have declined. And, in the case of delta, because its mutations have made the virus more transmissible. That attribute allows the virus to start making copies inside the host—the definition of infection—before the [immune system](#) has time to snuff it out.

Still, the cells that produce antibodies, called B-cells, retain the blueprint for making more of them in a hurry—meaning that most infections in vaccinated people will not escalate to a severe case of COVID.

"The risk of a really, really concerning variant arising is not super high," he said. "But it's not zero, either."

That's because the vaccines train the immune system to recognize the coronavirus "spike"—the tool that it uses to enter human cells. So if the spike mutates enough that the immune system has trouble recognizing it,

those mutations also can be self-defeating: making the spike less adept at penetrating cells.

The danger would be if the virus evolved two "compensatory mutations" at the same time—one enabling it to escape the immune response, the other restoring its infectivity through some other means, Wherry said. That's unlikely.

"You need two independent things to happen at the same time," he said. "But the longer the virus replicates, the more you're rolling the dice."

What it will take to reach normal

Public health experts say the road to normal, however that is defined, involves—no surprise—vaccines.

In the U.S., boosters have been recommended for people in various age groups, in some cases depending on underlying medical conditions or on which vaccine they initially received. The shots generally should boost the level of antibodies circulating in the person's bloodstream, potentially preventing even mild infections, Wherry said.

Far more effective, however, would be to vaccinate people who have yet to receive any shots, according to a new review of the evidence from ECRI, a Plymouth Meeting-based nonprofit that evaluates the safety and quality of health care.

"The focus should remain on vaccinating as many people as possible," said Marcus Schabacker, the research institute's president and chief executive officer.

Progress is steady in the U.S., though uneven, and the numbers should rise even more once the Pfizer-BioNTech vaccine is authorized for

children ages 5 to 11.

But success remains elusive in much of the rest of the world. As of Sept. 23, just 2.1% of residents in low-income countries had a single dose of a vaccine, the ECRI report found. The figure has climbed substantially as of Monday, hitting 3.6%, but remains well behind the numbers in developed nations.

That disparity is foremost a humanitarian issue, the report's authors wrote. And as many have noted, it also paves the way for new variants abroad that could travel here. More rolls of the dice.

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