

For nearly two years now, Americans have lived with Covid-19. We know that it can set off both acute and chronic illness, that it spreads best indoors, that masks help block it, that our vaccines are powerful against it. We know that we can live with it—that we’re going to have to live with it. Still, this virus has the capacity to surprise us, especially if we’re not paying attention. In a matter of weeks, the Delta variant upended the relative peace of America’s early summer and ushered in a new set of calculations about risk, masking, and testing. The pandemic’s endgame shifted. Here are six principles that are helping us make sense of the pandemic now:

The role of vaccines has changed (again)

The COVID-19 vaccines were originally meant to prevent severe infections. They do so very well. Unexpectedly spectacular clinical-trial results from Pfizer and Moderna raised hopes that these vaccines could protect against almost all symptomatic infections and might even be as good as the vaccines against polio and measles.

But, from the very beginning, vaccine experts warned that respiratory diseases are especially tricky to immunize against. The coronavirus first takes hold in the nose, and injections in the arm are just not very good at stimulating immunity in the nose. (They are still good, however, at raising immunity deep in the lungs to protect against severe disease.) Flu shots, for example, tend to be only 10 to 60 percent effective at keeping people out of the doctor’s office. If COVID-19 vaccines end up somewhere similar, they would prevent hospitalizations and death, but the coronavirus would still circulate. So, we need to adjust our expectations, again.

Vaccines work more like dimmer switches than on/off buttons, and as their protection fades out, there are three thresholds that we care about: protection against infection, against symptoms, and against severe disease. Protection against infection is always the first to erode—either because of new variants or because of waning immune responses over time. Protection against symptoms goes next, but protection against severe disease is the most durable.

The proportion of vaccinated people matters, but who they are and how they cluster also matters

Delta caused a new wave of cases in even the most vaccinated countries in the world, but the wave of hospitalizations that followed there have generally been much more modest. In the U.K., for example, where 66 percent of people are fully vaccinated, cases reached 80 percent of their winter peak this summer. But hospitalizations rose less than 25 percent. As U.K. health officials have declared, vaccines are “breaking the link” between infections and hospitalizations. Again, this means the vaccines are working. The United States seems to paint a different picture. Overwhelmed hospitals are turning patients away. They’re once again cramming beds into conference rooms and cafeterias. 54 percent of Americans are fully vaccinated. The difference between the U.K. and the U.S. isn’t just that fewer Americans are vaccinated. It’s that fewer of the most vulnerable Americans are vaccinated, and they tend to cluster together.

Risk of death and hospitalizations from COVID-19 rises sharply with age, and in the U.K. nearly everyone over 65 is vaccinated. A New York Times analysis found very few areas in the U.K. where more than 2 percent of residents are 65 and not fully vaccinated. In contrast, that number is above 10 percent in many counties in the American South and Mountain West. Even small differences in these rates can determine the level of crisis: A community where 10 percent of residents are unvaccinated seniors has essentially five times as many people who might need an ICU bed than a community where that number is only 2 percent.

Vaccine coverage also varies dramatically from county to county in the U.S. The more unvaccinated people are concentrated, the more easily the virus can find its next victim. Imagine three out of four people in every household are vaccinated; the unvaccinated person is unlikely to spread the virus very much at home. Now imagine three out of every four households are completely vaccinated; the virus will spread through the unvaccinated households. The overall vaccination rate is the same, but the results are very different.

This unevenness also means that ...

The people at greatest risk from the virus will keep changing

Since the pandemic's early days, vaccines have shifted the risk the virus poses to us, at a community level. Older people and health-care workers were among the first in line for the shots—a practical move to protect the people whose underlying conditions or jobs ranked them among the most vulnerable. But younger members of the community had to contend with a slower schedule, and vaccine makers are still figuring out the correct dosages for the youngest among us. That's all shifted the virus's burden down to uninoculated children. At the same time, the virus has been evolving into speedier and speedier forms; by the time Delta slammed the world this spring, many of its most viable hosts were at risk not because of their age or circumstances, but in spite of it.

As vaccination increases, a higher proportion of cases will appear in vaccinated people—and that's what should happen

In July, after a COVID-19 outbreak in Provincetown, Massachusetts, a Washington Post headline noted that three-quarters of the people infected were vaccinated. Throughout the summer, many stories have reported similar figures, always with the same alarming undercurrent: If vaccines are working, how could vaccinated people make up such a large proportion of an outbreak? The answer is simple: They can if they make up a large proportion of a population. Even though vaccinated people have much lower odds of getting sick than unvaccinated people, they'll make up a sizable fraction of infections, hospitalizations, and deaths if there are more of them around.

Let's work through some numbers. Assume, first, that vaccines are 60 percent effective at preventing symptomatic infections. Vaccinated people are still less likely to get infected, but as their proportion of the community rises, so does the percentage of infections occurring among them. That is why this particular statistic—the proportion of vaccinated people in a given outbreak—is so deeply misleading.

Note percentage. In July, an NBC News article stated that “At Least 125,000 Fully Vaccinated Americans Have Tested Positive” for the coronavirus. In isolation, that’s an alarming number. But it represented just 0.08 percent of the 165 million people who were fully vaccinated at the time. The denominators in these calculations also change, dragging the numerators higher along with them. As surges grow, so too will the number of infected people, which means the number of breakthrough infections will also grow.

Even if the percentage of breakthroughs stays steady, though, vaccines will feel less effective if the pandemic is allowed to rage out of control, because ...

Rare events are common at scale

Throughout the past year and a half, commentators have downplayed a variety of pandemic-related risks because they were “rare”—deaths, long COVID (which isn’t actually rare), infections and multisystem inflammatory syndrome in children, and more. But infectious diseases spread, and if they do so widely enough, events that are relatively rare can rack up large numbers: A one-in-a-thousand event will still occur 40,000 times when 40 million people are infected. Such events can’t be written off, especially when they involve decades of lost health or life.

As outbreaks spread, more types of rare events become noticeable as well. A wider pandemic is also a weirder pandemic. Many aspects of COVID-19’s mystique—the range of symptoms and affected organs, the possibility of persistent illness, reinfections—are common to other viral illnesses, but go unnoticed because most illnesses don’t sweep the world in a short span of time. Similarly, as this current post-vaccine surge continues, breakthrough infections will feel more common, newspapers will have more stories to run about them, and more people will know someone who had one. Our reaction to such events must account for both the denominator and the numerator—both how relatively common they are and how much they cost each affected individual. And that assessment will change as the pandemic waxes and wanes, and as the virus itself continues to mutate.

There is no single “worst” version of the coronavirus

Right now, Delta, a super-transmissible variant that hops into human airways is especially well poised to rip through the world’s mostly unvaccinated, mostly immune-naïve population—which is exactly what it’s doing. Laxness around masking, distancing, and other infection-prevention measures, in the United States especially, has given Delta plenty of opportunities to hop from human to human, further fueling its rise. (There is, by the way, little incentive for the virus to get deadlier along the way. Viruses want to spread, not kill.)

All variants, though, will have some common weakness: They can be stopped through the combined measures of vaccines, masks, distancing, and other measures that cut the conduits they need to travel. When viruses spread faster, they can be tougher to control. But they can’t persist without us, and our behavior matters too.