

# Expert discusses likelihood of achieving herd immunity

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Dr. Robert "Chip" Schooley. Credit: University of California - San Diego

"When will we get 'back to normal?'" is a question looming on many Americans' minds. The answer largely depends on the country's ability to substantially ramp up immunity to SARS CoV-2. The introduction of safe and effective vaccines, which led to plummeting COVID-19 case rates in the spring and early summer, gave the U.S. a glimmer of hope that herd immunity was in reach and that the pandemic was getting under control. However, the Delta variant is now a major concern, especially with only half of the country currently fully vaccinated. The variant is a highly contagious SARS-CoV-2 viral strain that has swept rapidly through the country and has become the dominant variant.

What impact does the Delta variant have on our chances of achieving herd immunity? What can we do to prevent the spread of a fourth wave of COVID-19 infections? And how safe are fully vaccinated individuals from the Delta variant? To address these questions and more, we spoke to Dr. Robert "Chip" Schooley, professor in the Department of Medicine at UC San Diego's School of Medicine and co-lead of the Return to Learn program.

## **Q. What is the likelihood of the U.S. reaching herd immunity?**

Schooley: Zero, at least over the next several years. We should stop talking about "herd immunity" in the context of this virus because it implies that we will reach a level of vaccination in the population that will result in a disappearance of the virus, ultimately protecting those

who have not been vaccinated.

Recovering from the virus does not induce "permanent" immunity; people who have recovered from infection can be infected with new strains of the virus. The vaccines are extremely effective in preventing serious disease and they reduce—but do not eliminate—the possibility that people can be infected and shed enough virus to infect other people.

This virus behaves like other RNA viruses; it evolves new variants on a continual basis and it will continue to do so. As these new variants double back through the population of infected people, there will be enough circulating virus that unvaccinated people will remain at significant risk for [severe illness](#) for months or years to come. The Delta variant has complicated this further because it is three times as infectious as the virus that we dealt with at the beginning of the epidemic. Thus, when someone who is unvaccinated comes into contact with others, they can become infected much easier than they could have been in the past.

## **Q. What is different about the rise in COVID-19 cases we are seeing now, compared to previous peaks?**

Schooley: We are seeing parallel epidemics. Vaccinated people become infected much less frequently than those who have not been vaccinated. When they do get infected, they are much less likely to become ill. Many don't even know they have been infected because their symptoms are so mild (or are non-existent). In parallel, with these mild cases in the vaccinated population, we are seeing an extremely severe outbreak of disease and death in the unvaccinated population that is just as explosive as what we saw last winter before the vaccines became available.

## **Q. What is the likelihood of a "breakthrough"**

## **COVID-19 case for someone who has been vaccinated with one dose or even two doses?**

Schooley: The term "breakthrough COVID case" has been misused. As Paul Offit, director of the Vaccine Education Center at Children's Hospital of Philadelphia, recently pointed out, this term should be reserved for the very rare people who become infected following vaccination and become severely enough ill to be hospitalized. The vast majority of people who become infected after vaccination either have no symptoms or have an illness that is so mild that it is often mistaken for a cold.

No vaccine is 100 percent effective, but the data is clear: 95 to 98 percent of those who have COVID-19 that is severe enough to be hospitalized have not been vaccinated. And 99.5 percent of the deaths from COVID are occurring among the unvaccinated. One dose of an mRNA vaccine lowers the risk of severe disease but only by half as much as the full two-dose series.

## **Q. Can fully vaccinated people still transmit the virus to others?**

Schooley: The best data we have shows that mRNA vaccines reduce death by 99 percent and hospitalization rates by 95 percent. As more data emerges and more populations are being studied with systematic sampling, it is clear that the asymptomatic shedding rate for vaccinated individuals is higher than the initial studies have suggested and that some of them can transmit the virus to others. This is likely because we are now dealing with much more transmissible viral variants than those that were circulating when the initial studies were done and because we are paying more attention to "sniffles" and "colds" that people were assuming were allergies or the flu.

These very mild symptoms can easily be missed, as there were lower thresholds to evaluate them. While data is still emerging about how infectious fully vaccinated people who contract COVID are, we do know that some of them have enough virus to transmit it. We do not yet have enough quantitative data to know exactly how their level and duration of infectivity compares to the unvaccinated population, but know that on average, vaccinated people who do get infected shed less [virus](#) for a shorter period of time than those who have not been vaccinated when they become infected. In addition, we know that vaccinated people also have a far lower chance of becoming infected with the coronavirus and, thus, they are responsible for far less spread of the disease.

### **Q. When can we expect the vaccines be approved by the FDA?**

Schooley: Very few vaccines on the market have been dispensed to so many people. The safety profiles on all the vaccines are very good, so we expect no surprises about full FDA approvals when they come out. I don't know their timeline, but it is important to note that no steps were skipped in getting the vaccines on the market, nor was any safety compromised during the vaccine trials. For COVID-19 vaccines, the FDA set high safety standards for vaccine developers to meet. This infographic from the National Institutes of Health shows the four phases a vaccine goes through before it is released to the public.

### **Q. For those who have only gotten one dose of the vaccine, is there a certain timeframe when they have to receive the second before the effects wear off?**

Schooley: For two-dose mRNA vaccines, such as Pfizer and Moderna, one dose provides some protection from severe disease, but it is not enough to protect people from the Delta variant. The vaccines were

studied with a three-or four-week interval between the two doses, but we know that the second dose can be given quite a bit later and still have the same or better booster effect. The second dose can be given up to 12 weeks later with no loss of effectiveness.

We do not know how much longer this interval might be because it has not been systematically studied, but it is likely longer. The important message is that if you have had only one of the two doses, you are not well protected, especially against the Delta [variant](#). One dose of an mRNA [vaccine](#) lowers the risk of severe disease but only by half as much as the full two-dose series.

## **Q. What can our UC San Diego community do to keep themselves and each other safe from the current spread of COVID-19?**

Schooley: Get vaccinated, if you have not yet been vaccinated and encourage those in your family and among your friends who have not yet been vaccinated to go out and get vaccinated! Vaccinations are the number one thing we can do to keep the campus, community and our friends and family safe. When community transmission rates are substantial, as they are in San Diego at present, vaccinated people can further reduce the community transmission rate by wearing a mask when indoors or in crowds outdoors with others. We're all in this together and we will only emerge from this pandemic if we all work together to end it.

Provided by University of California - San Diego

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