UC SANTA BARBARA

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# Delta Variant Q&A

The emergence of the highly transmissible SARS-CoV-2 Delta variant has raised a host of questions about the variant itself, the effectiveness of vaccines in preventing serious illness, and the impact on unvaccinated individuals.

To better understand the data related to this new, virulent strain and how guidelines and protocols should be adjusted to mitigate its spread, The Current has brought together a panel of experts that includes Carolina Arias Gonzalez, a virologist and assistant professor of molecular, cellular and developmental biology; Stuart Feinstein, campus COVID-19 response coordinator and professor of molecular, cellular and developmental biology; and Scott Grafton, M.D., campus COVID-19 mitigation program manager and professor of psychological and brain sciences.

**What is the Delta variant and why is it dominant?**

The Delta variant is a new strain of the SARS-CoV-2 virus that causes COVID-19. As viruses copy their genome during infection, errors can be incorporated that in some cases change the behavior of the virus. As the mutations accumulate in the genome, new versions of the virus — variants — are established. In the case of SARS-CoV-2, the Delta variant has mutations that make the virus more contagious. The reasons behind the increased transmissibility of Delta are still under investigation, but we know that some of the mutations in this variant have changed how the virus interacts with the cell during their first encounter, and allow the virus to bind tighter to the cell, making infection easier.

Delta is by far the most widespread strain throughout the U.S. and in Santa Barbara County.

**Does the increasing percentage of vaccinated people getting breakthrough Delta variant infections mean the vaccines are not as effective as previously believed?**

This is a misleading way to think about vaccine effectiveness. If the entire population is vaccinated, then 100% of cases, whether Delta or other variants, are “breakthrough” infections. A more important number to track is the number of new cases per 100,000 vaccinated people per day. In Santa Barbara County we have approximately 7.5 cases per 100,000 vaccinated people per day. Of note, this is more than 4 times less than the number of unvaccinated people becoming infected — that number is approximately 38 cases per 100,000 unvaccinated people per day.

The vaccine provides excellent protection against all known strains of SARS-CoV-2, including Delta. A study from UC San Francisco health care workers found that vaccinated workers were 5 times less likely to contract COVID-19 and 25 times less likely to be hospitalized for it than their non-vaccinated colleagues.

**We’re reading in the media that the vaccines are only 67% effective at preventing severe illness from the Delta variant. Is that true?**

That number is misleading because it fails to consider that both the vaccination rates and the risk of severe disease change from young adulthood to old age. Once these effects are taken into account, multiple recent real-world studies show the vaccines are over 90% effective at preventing severe illness in all age groups.

**How worried should those who are fully vaccinated be about contracting COVID-19?**

The upward trend in national statistics is being driven almost entirely by outbreaks in places with low vaccination rates. While the frequency of COVID-19 hospitalizations and deaths are greatly reduced by the vaccine, unvaccinated Americans now account for almost all recent COVID-19 cases and related hospitalizations and deaths.

**Does the Delta variant cause more serious disease in adults?**

A recent analysis by the Centers for Disease Control and Prevention integrates information from Canada, Singapore and Scotland and finds higher odds of hospitalization, ICU admission and death from the Delta variant in unvaccinated people compared to the Alpha variant (also known as B.1.1.7), which was the dominant variant in the United States before Delta's rise.

**Does the Delta variant make children sicker than the previous variants?**

In the spring of 2021, prior to the arrival of the Delta variant, 0.8% of children diagnosed with COVID-19 were admitted to the hospital. Since the arrival of the Delta variant, this has increased slightly to 0.9%. What has increased is the overall number of infected people in a community, including children, because of the Delta variant.

**Does the COVID-19 vaccine prevent the spread of asymptomatic, mild or moderate COVID-19?**

Vaccines were approved based on their ability to prevent severe infections — that is, hospitalizations and/or death. Before the arrival of the Delta variant, there was very encouraging evidence that the vaccines were approximately 90% effective at also preventing asymptomatic, mild or moderate infections. Recent evidence suggests that with the emergence of the Delta variant this effectiveness for less than severe disease has been reduced to about 66%. Relative to most vaccines, including the flu shot, this is still very strong protection. But the most important point to remember is that the vaccines are especially effective at preventing the most serious outcomes, that is, hospitalization and death.

Recent data also suggest that the duration of viral shedding following infection with the Delta variant is shorter in vaccinated individuals. A shorter infection may help reduce the chances of secondary transmission.

**We're hearing a booster may be necessary for maintaining protection against COVID-19. What is the basis for recommending booster vaccinations?**

Solid, real-world and laboratory evidence shows that boosters can add immunity for those who are immunocompromised. There is general consensus among those in the medical community that those individuals should receive an additional dose, or "booster." For everyone else, evidence as to whether or not boosters will make a big

difference in preventing severe, mild or asymptomatic infection is still emerging. We know severe illness from COVID-19 is more common the older one gets. This is a basis for the emerging recommendation that those over 65 get a booster. Another argument in favor of boosters is a concern that the initial vaccine might lose some of its effectiveness after many months. This has led to a consideration of recommending the vaccine booster for everyone 8 months after their initial doses.

**Are booster shots safe?**

Because boosters have been rolled out only recently, we don't yet have a strong safety signal to answer this question. However, remember that a booster is just another injection of the same material as in the earlier vaccine injection(s) — not something different. Notably, though, the safety signals for the RNA-based vaccines from over 180 million recipients was outstanding. Furthermore, immunocompromised individuals who received an extra dose in clinical trials tolerated it well.

**Is there another variant on the horizon that looks worse than the Delta variant?**

The Lambda variant received a lot of attention as it spread rapidly and case counts climbed in South America. However, laboratory studies of its ability to bind to human cells or to escape neutralizing antibodies show it is very similar to Delta. There is no surveillance data so far that shows it can out-compete the Delta variant in North America.

**If I can still get infected with the Delta variant after I'm fully vaccinated, why bother getting vaccinated in the first place?**

Vaccination greatly reduces your chances of developing serious illness. Presently, the vast majority of serious illness and hospitalizations are occurring among unvaccinated individuals.

**If an individual is fully vaccinated and is exposed to someone who has been infected with the Delta variant, does that individual still need to get tested and quarantine for 14 days?**

Guidance from the CDC for vaccinated individuals with a known exposure to any variant of COVID-19 recommends testing 3 to 5 days following exposure, whether or

not they have symptoms. They should wear a mask indoors in public for 14 days following exposure or until they receive a negative test result, and they should isolate for 10 days if they have a positive test result.

**How effective are masks?**

Modeling studies from colleagues at UC San Diego show that the benefit of indoor masking on transmission of the virus — including the Delta-variant — can result in 4 times fewer cases on campus. By using a good two-layer mask indoors we can all make a powerful contribution to the community.

**COVID-19 cases come in spikes over a few months. What reverses the growth of cases in a community?**

Intuitively, you might think the reversal happens because everyone is immunized by a vaccine or prior infection. However, real-world estimates suggest that the reversal occurs because people change their behavior. As local conditions worsen, people become more cautious. This further supports the importance of masking, distancing and spending less time indoors.

**How do conditions in Santa Barbara County compare to “hot spots” around the country?**

In late August, Santa Barbara County was experiencing about 21 new cases per 100,000 people per day. And the North County has a higher rate of new cases than does the South County. By comparison, Harris County, Texas, encompassing the greater Houston metropolitan area, was experiencing 334 new cases per 100,000 people per day. Imagine if Santa Barbara County had 12 times as many cases as it currently does. The differences are fully accounted for by the choices we all make in facing this pandemic.

**How does the campus assess the COVID-19 risk associated with in-person instruction?**

The most important information we have to work with is the number of new positive tests (identified using high performance testing methods) in the campus community that are diagnosed each day. This number can then be normalized in a variety of ways — cases per 100,000 people per day; % positive cases; new cases per 100,000 people per day averaged over the prior week. The CDC provides clear guidelines for

using these measures to operationally define conditions of “high” virus transmission in the community. Similar metrics from the County serve as an important point of reference for detecting an unacceptable growth in cases that are specific to the UC Santa Barbara community. Critically, growth rates in these metrics, i.e. their trends are as important as absolute thresholds in identifying conditions of high virus transmission.

In general, the measures described above are biased to count people who develop symptoms. By also initiating a campus testing program with weekly random sampling of a fraction of the campus community, we overcome these potential sources of bias and better assess the underlying change in the prevalence of disease, including asymptomatic cases.

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## About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.