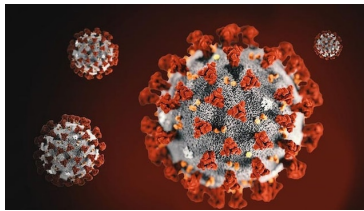


# What we now know about how to fight the delta variant of COVID | Column

An expert explains why vaccines — and masks — are so important, and why delta is different and more dangerous.



We all know what this is ...

I am in a unique position to report on what is going on with COVID-19, particularly the delta variant and why it's so dangerous, and how it interacts with the vaccines. I'm the Special Assistant to the National Director of Pathology and Lab Medicine for the entire Veterans Affairs system, with a specific role in advising on elements of COVID testing for the system.

As such, I have a front row seat to all of the latest data since we use that information to make our national-policy decisions. So, here are a few important points that help explain why you should get vaccinated *and* wear a mask. I'll do my best to stitch this all together so it makes sense:

**1. Like Gorilla Glue.** The delta variant (lineage B.1.617.2) has a particular collection of mutations in the spike protein (that knob-like

projection you see in renderings of the virus) that make it extremely effective in attaching to human cells and gaining entry. If the original COVID strains were covered in syrup, this variant is covered in ultrafast-drying Gorilla Super Glue (industrial strength).

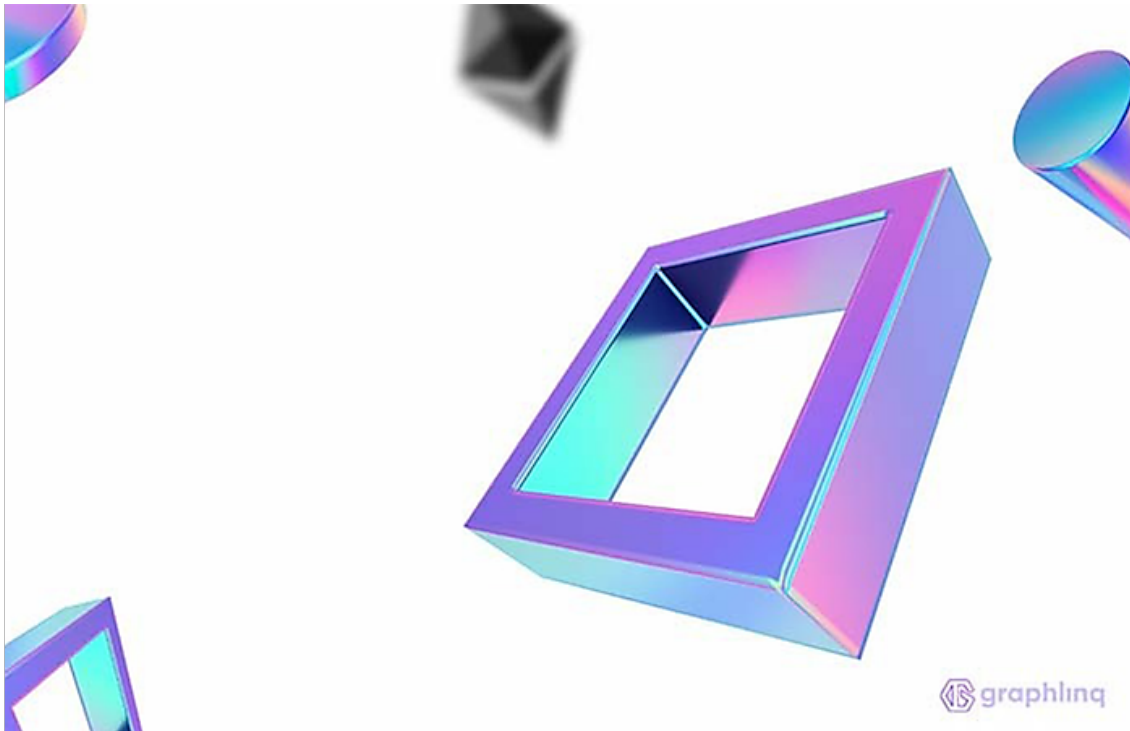
**2. 1,000 times higher.** There are two recent publications which demonstrate that the viral loads in the back of the throats of infected patients are 1,000 times higher with the delta than with previous variants. I can tell you from data in my own labs, that is absolutely true.

Dr. J. Stacey Klutts [ Provided ]

We are seeing viral signals we never saw last year using the exact same assays.

**3. Much more infectious.** This much higher load plus the ultra “stickiness” of the delta strains for adhering to human cells makes it remarkably more infectious than previous strains. You may have heard of R0 (Pronounced R naught) which is, in a nutshell, the number of people to which an infected person would be expected to transmit the virus. Early versions of the virus had a 2 to 2.5 R0 value. So one infected person would infect two or so people on average. Delta has an R0 of about eight! In the infectious disease world, that’s almost unheard of. Chickenpox and measles are about all we have ever seen that spread that efficiently from human to human. This changes the story line completely from earlier in the pandemic and makes this surge, in many ways, like a completely different pandemic event.

**4. Five days.** There is another recent publication out of Singapore with data that confirms something we suspected. I will explain more about the “why” on this below when I talk about vaccines, but the gist is this: The viral loads in the *throats* of vaccinated persons who become infected with delta rises at identical rates as in unvaccinated persons, but only for the first few days. After five days or so, the viral loads in the vaccinated person start to quickly drop whereas those in the unvaccinated person persist. This key set of observations is important for several reasons relating to vaccinated persons serving as vectors for spread (see below).



**5. Young people.** This pandemic, Round 2, is primarily being observed in younger patients than in Round 1. Our children’s hospitals are even already filling up or full. Because of the delta viral dynamics, it is much more capable of causing severe disease in a larger swath of the population. You spew enough of any human pathogen on someone without immunity, and it’s not going to end well. This sets up very

poorly for the beginning of the school year — which has already started in Florida — and it scares me. Check that. It is actually terrifying. I sure hope we have vaccines for the 5- to 11-year-olds soon.

**6. Vaccines work!** Speaking of vaccines. Are they working? Yes! They are absolutely doing their expected job. We know a lot about vaccines for upper respiratory viruses, as we have been giving the population one every year for decades (influenza). To explain all of this, I need to provide some biological context. When you get a vaccine as a “shot,” the “antigen” in the vaccine leads to formation of an antibody response. You probably knew that. What’s important, though, is that it primarily leads to a specific Immunoglobulin G (IgG) response. That’s the antibody type that circulates around in really high numbers in the blood, is located some in tissues and is more easily detectable by blood tests, etc.

What that shot does *not* do is produce an Immunoglobulin A (IgA) antibody response to the virus at the surface of the throat mucosa. That’s the antibody type that could prevent the virus from ever binding in the first place. As such, in a vaccinated person, the virus can still attach like it’s about to break into the house, but it doesn’t realize that there is an armed homeowner on the other side of the door. When that virus is detected, the IgG beats it up and clears it before the person gets very ill (or ill at all). (Sidebar: Anyone ever had their kid — or themselves — get the “Flumist” vaccine as their annual flu booster? The idea there is to introduce the antigens at the surface of the throat mucosa leading to that IgA response that will prevent infection from happening at all. Sounds good and still has a place, but it isn’t quite as effective overall as the shot.)

**7. Preventing disease and death.** The COVID-19 vaccines are

designed to prevent disease/death through that IgG response (though it does also reduce infections somewhat). How good are the vaccines at doing all of this with delta? The Centers for Disease Control and Prevention has just released data addressing that very question. Punchline: They're remarkably good! The vaccine shows an 8-fold reduction in the development of any symptomatic disease secondary to delta. For hospitalization, it is a 25-fold reduction. That's 25 times! Remarkable. For death, it is also 25 times! This is a very effective pharmaceutical class when looking at overall efficacy toward the intended/expected purpose. When looking at the very tiny side effect profile, I'd personally consider it one of the best overall pharmaceuticals on the market in any class of drugs.

**8. So, you're vaccinated?** First of all, a sincere, heart-felt thank you! But you may now ask, so why do I again need to wear a mask? We talked about disease, hospitalizations and death above, but what about infections themselves? The vaccines are now estimated to provide a 3-times reduction in infection. For reasons that I tried to make clear above, it isn't surprising that the vaccine is less effective at preventing infection vs. preventing disease. We are indeed seeing detectable virus, at high levels, in asymptomatic, vaccinated persons when we test them prior to procedures, etc. We have a few that are mildly symptomatic, too.

While we now understand that the virus fades from the back of the throat pretty quickly in a vaccinated person, we also know that an infected, vaccinated person can transmit this very infectious virus to others for at least a couple of days. So, as before, you are being asked to wear a mask to primarily protect others.

We need you again to interrupt the transmission cycle of the virus, as

you don't know when you might be infectious. The vaccine alone cannot interrupt this cycle when there is a lot of virus in the community within unprotected persons.

**9. What's next?** I live and practice in Iowa, and I see the tsunami wave on the horizon. It's typical for respiratory viruses to begin in the southern United States (where it is hot and everyone clusters indoors in the air conditioning to escape the heat) and then creep north to affect those areas when it gets colder (and people go inside because it's getting colder). If you live in the north and are not vaccinated, it is not too late, but it's getting damn close. It's also time to start wearing masks in public again (ugh...I hate it, too).

Those of you in the south, particularly in Florida, know that the tsunami is already on your shores. If you weren't already off the beach, you might be in trouble. However, if you are there and haven't yet been affected, run like hell to metaphorical higher ground — get vaccinated, wear a mask.

I beg of you, watch that wave and don't ignore it. I have zero political agenda (I hate politics). I'm just a nerdy scientist and physician who loves you all, and I certainly don't want to see a mass of my friends grieving — or dead — because I didn't yell loud enough to get you and your families off that beach. So, run! (to your pharmacy ... driving is allowed). You don't want any part of this thing without vaccine on board.

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*Physicians and Scientists (ACLPS) and chairs the National VA Clinical Microbiology Council in addition to his national roles referenced above. This is adapted from a Facebook post with permission of the author.*