

HEALTH

Virus Variants Mu and Lambda Unlikely to Supplant Delta

The Delta variant of the Covid-19 virus makes up 99% of new Covid-19 cases in the U.S. and is likely to outcompete Lambda, Mu and other new variants in the hunt for susceptible people to infect.

By Robbie Whelan

The Delta variant of the Covid-19 virus appears well positioned to maintain its dominance over new variants such as Lambda and Mu, virologists say.

Delta accounts for 99% of new Covid-19 cases in the U.S. and roughly 88% of cases globally, according to data from the Centers for Disease Control and Prevention and Nextstrain, an open-source pathogen-tracking service. Virologists expect Delta to outcompete new variants of the SARS-CoV-2 virus, including Lambda and Mu, in their hunt for people susceptible to Covid-19.

The scientists say new case waves would likely be driven by Delta and its sub-variants rather than a new virus lineage. That's because Delta has evolved to be so transmissible that other variants can't keep up with the pace of its spread. "Nothing so far has appeared competitive to Delta," said Trevor Bedford, a virologist with the Fred Hutchinson Cancer Research Center in Seattle.

Dr. Bedford said that Delta, on its current trajectory, would achieve "fixation" as the ubiquitous strain of the virus within roughly a year of its emergence, an unusually rapid rise. With seasonal flu, by contrast, strains usually take two to five years to achieve fixation, he said. The Delta strain's dominance is in some ways good news, because it doesn't appear to cause more serious Covid-19 than earlier known variants, and authorized vaccines appear effective against it. "With Delta's spread, we're building up more and more immunity," Dr. Bedford said.

Lambda and Mu emerged in South America, the only continent where Delta isn't dominant. Lambda, which emerged in Peru and at one point represented as much as 92% of cases there, has since dropped as a share of new infections there and hasn't gained ground in the U.S.

The first cases of the Mu variant, also known as B.1.621, were identified in Colombia in January, and it quickly became dominant in that country. Mu has since spread to nearly 50 countries, including the U.S., where the CDC reports that it represents 0.1% of sequenced cases. The World Health Organization identified Mu as a "variant of interest" on Aug. 30, one notch below the "variant of concern" designation.

But since Mu's domination of Colombia, the variant's fitness, or its ability to reproduce by generating infectious virus copies, has begun to show signs of weakening. Over the past three months, Delta has risen to 7% of cases in Colombia, competing with Mu and another variant known as Gamma, which has almost disappeared from the country, according to Nextstrain.

In the earliest waves of the pandemic, as SARS-CoV-2 spread quickly, there wasn't much genetic variation in the virus because it didn't face the neutralizing antibodies produced by immunity, said Theodora Hatziioannou, a virologist at Rockefeller University in New York.

But starting last fall, when some patients began to experience repeat infections, variants like Alpha and Beta emerged, equipped with mutations that helped the virus escape the immunity provided by prior infection. The mutations, particularly those found in the Beta variant, were the result of pressure on the virus to evolve to evade immunity, or die out, Dr. Hatziioannou said.

Scientists in her lab used tests to recapitulate virus evolution in infected people and found that most mutations were geared toward helping the virus get around neutralizing antibodies. The accumulation of too many mutations came at the expense of maximizing transmission, they found.

In a forthcoming paper to be published in the journal Nature, Dr. Hatziioannou and her colleagues conclude that the primary driver of the virus's mutations is what's known as immune escape, or its evolutionary inclination to evade immune protections, rather than to maximize transmissibility.

“If the virus acquires too many mutations that make it resistant to everything, it will also affect its ability to replicate,” she said.

Recent research by scientists in the U.K. and Chile indicates that the Mu and Lambda variants evolved with mutations associated with immune escape, and may have vaccine-evading properties similar to the Beta variant's. Some virologists believe that the Delta variant evolved to maximize transmissibility and that its ability to spread rapidly will eventually reach a ceiling as more of the global population gets vaccinated. “It looks like this virus is already driving a Lamborghini right now in terms of transmissibility, so I'm not sure it can get much faster,” said Jeremy Kamil, a virologist at Louisiana State University Health Shreveport who is studying coronavirus genetics.

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