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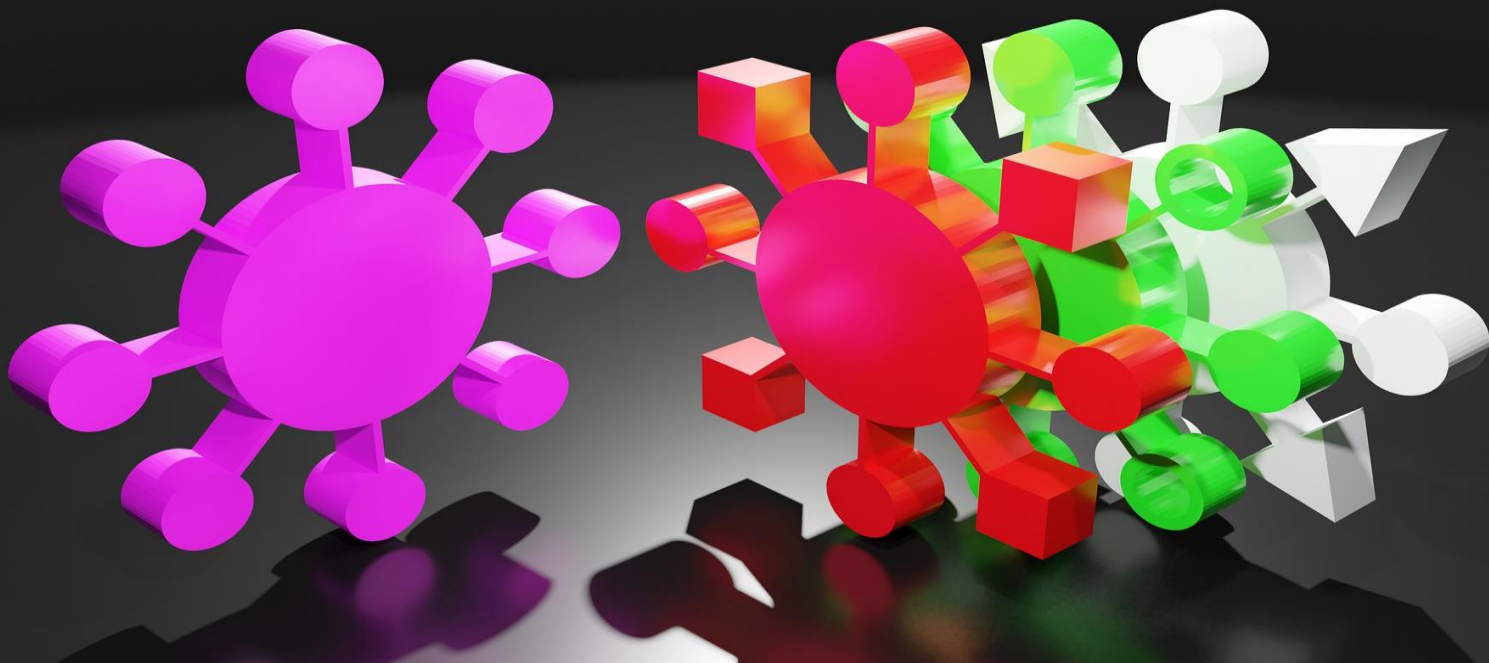
INSIGHTS

Analyzing the Delta Variant Of SARS-CoV-2

3 Jul 2021 | Aditi Kandlur and Saqib Uzair, Risk Intelligence Team

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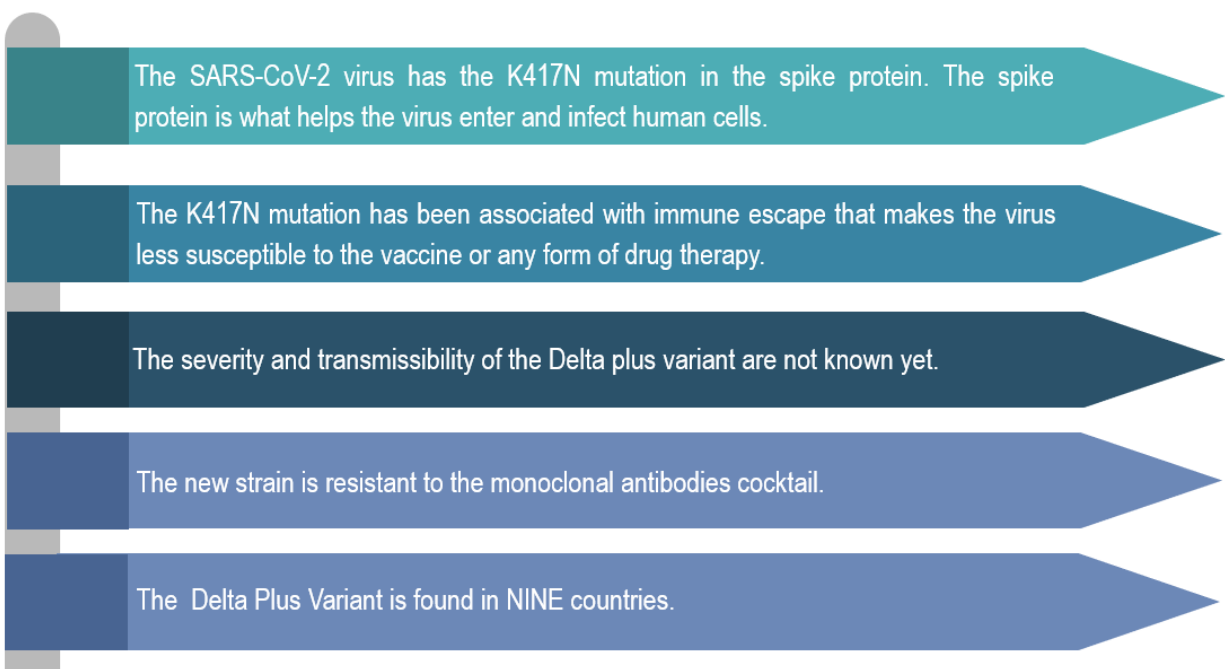
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I. INTRODUCTION

The Delta Plus variant of SARS-CoV-2, formally known as AY.1 or B.1.617.2.1, it is a variant of Delta (B.1.617.2), which was first identified in India. It has an additional mutation called K417N, which has previously been identified in the Beta variant (first found in South Africa) and the Gamma variant (first detected in Brazil). These variants are characterized as being highly infectious and may reduce the potency of vaccines. It is a version of the coronavirus that has been found in more than 80 countries since it was first detected in India. The new mutation in the Delta variant was first detected in Europe in Mar. 2021. In Jun, COVID-19 patients in India were also found to have the mutant virus. These developments have raised concerns.

THE MUTATION



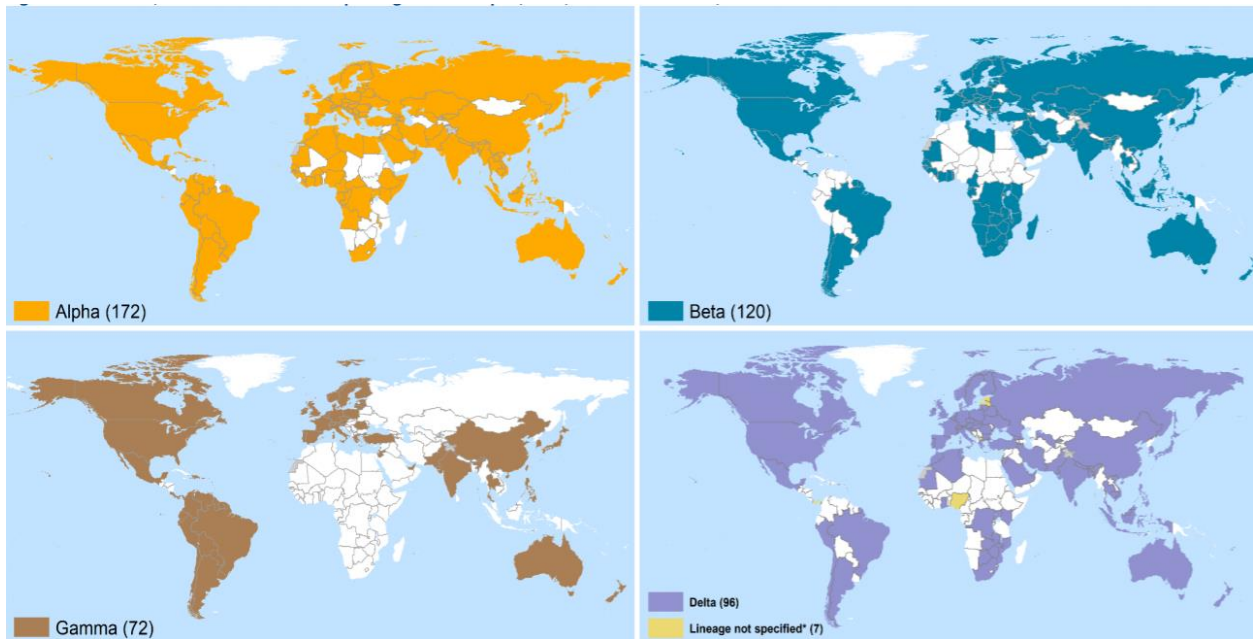
II. WORLD HEALTH ORGANISATION

The World Health Organisation (WHO) has defined Variants of Concern (VoC) as those that have demonstrated to be associated with the following one or more changes in global public health status:

1. Increase in transmissibility or detrimental change in COVID-19 epidemiology; or
2. Increase in virulence or change in clinical disease presentation; or
3. Decrease in effectiveness of public health and social measures or available diagnostics, vaccines, therapeutics.

FOUR "VARIANTS OF CONCERN"	
Alpha	172 countries
Beta	120 countries

Gamma	72 countries
Delta	96 countries



Source: WHO

WHO ON THE DELTA VARIANT

The WHO has identified the Delta variant of SARS-CoV-2 to be the most transmissible among the others and is rapidly spreading among the unvaccinated populations.



Dr Maria Van Kerkhove, COVID-19 Technical Lead at the WHO said the Delta variant is a “dangerous” virus and is more transmissible than the Alpha variant and is expected to become a dominant lineage if current trends continue. The WHO has observed trajectories of incidents that are almost “vertical” in a number of countries around the world.

WHO ON DELTA PLUS VARIANT

Chief Scientist Dr Soumya Swaminathan told NDTV that the Delta Plus variant of the coronavirus is not presently a "Variant of Concern" for the World Health Organisation as its infection numbers are still low.

There is little evidence so far specifically linking Delta Plus variant to large outbreaks and significant disease transmission, which is why it has not yet appeared in the World Health Organization's list of 'Variants of Concern', which includes Alpha, Beta, Delta, and Gamma variants.

III. DELTA VARIANT IN INDIA

The Delta variant is now regarded as the most prevalent one in India, comprising nearly 31% of the 21,000 community samples processed until late May. The variant has been the dominant strain that led to the crippling second wave in India, as reported by CCMB, Hyderabad and BHU, Varanasi. The highly transmissible variant, first identified in India in late 2020, is behind the fresh surge being reported in countries like the UK, Israel, Russia and Australia.

An ongoing Indian study says the Delta variant is present in all states but has infected most in Delhi, Andhra Pradesh, Gujarat, Maharashtra, Odisha and Telangana, which were the worst hit in the second surge. The role of the Delta variant in breakthrough infections - or Covid infections after vaccination - has also been found to be big. They also found that this was not the case when it came to the Alpha variant.

HOW IS THE "DELTA PLUS" VARIANT DIFFERENT?

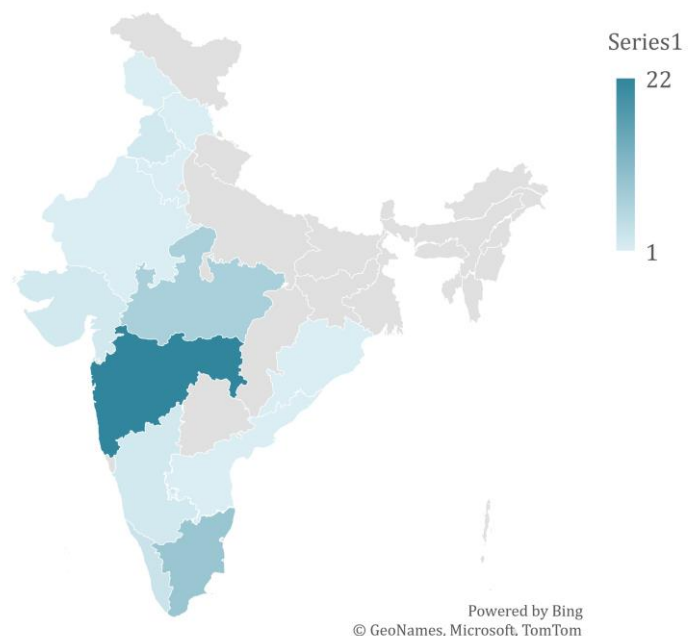
The new mutation in the Delta variant was first detected in Europe in Mar. In Jun, COVID patients in India were also found to have the mutant virus. These developments have raised concerns that the mutation may fuel another wave of infections in the country.

The mutation in the spike protein of the virus, however, is not new. Known as "K417N", it has been previously reported in the Beta variant first found in South Africa. With this mutation, the virus has shown an ability to escape the antibodies conferred by COVID vaccination, at least to some extent.

DELTA PLUS VARIANT

The Delta plus variant was first discovered in Maharashtra. The state has recorded maximum number of Delta plus infection cases in the country. This variant has now been detected across 12 states including Maharashtra. There have been 56 cases and 4 deaths in patients detected with this variant, as of 2 Jul 2021. The detailed summary of the cases and state measures can be found in the [Annexure](#).

Distribution of Delta Plus Variant Cases



WHO IS MOST LIKELY TO BE INFECTED?

Those with comorbidities and old age are at increased risk of contracting the delta variant. Public Health England also described the vulnerable group, claiming that the young and unvaccinated are at increased risk of being infected with the delta strain.

The Scottish study observed that two doses of vaccine provide much better protection than one dose against the delta variant. However, some studies say that these variants can infect vaccinated people, though the infection does not turn severe.



HEALTH MINISTRY'S ADVISE TO STATES THAT HAVE REPORTED DELTA PLUS VARIANT

Based on the recent findings of INSACOG, the Union Health Ministry has alerted and advised the affected states where this variant has been found in genome sequenced samples. Also stating that the cases still remain to be localised and is an opportunity to keep it restricted and prevent its spread among the population.

The Union Health Ministry has advised that the Public Health Response measures, while broadly remaining the same as have been implemented by them earlier, have to become more focused and effective.

The Centre has requested for immediate containment measures in affected districts and clusters. The State ministry has been advised to carry out prompt vaccination, tracing, testing and prevent crowding and interaction of large groups of people. The state has been instructed to ensure positive samples reach the INSACOG labs to keep the epidemiological tracks up to date, these can be used for further guidance to be provided to States.

DEFENSE AGAINST THE DELTA PLUS VARIANT

Area of Concern



This variant has significant differences compared to the strain that has been used by pharma companies to design vaccines, and tests are needed to check if the existing vaccines continue to be effective against the variants dominant now. Tests in the U.K., South Africa, and Brazil have shown that vaccines, while effective, appear to produce fewer antibodies when confronted with variants such as Delta.

The ICMR-National Institute of Virology and the CSIR-Centre for Cellular and Molecular Biology, Hyderabad have conducted laboratory tests to determine the potency of Covishield and Covaxin against the Delta variant. While antibodies continued to be produced against the variant, they were fewer than those produced against the strain used by companies to prepare their vaccines.


Approved Vaccines in India and Delta Plus Variant

Studies are under way in India to assess the effectiveness of vaccines against Delta plus. It is important to note Delta plus has not yet taken off substantially, and the World Health Organization has not yet classified it as a variant of concern.

However, some studies have shown that the available vaccines work against variants, including the delta variant.

COVIDSHIELD
Vaccine is said to be effective against the Delta variant. 2-fold reduction in neutralising antibody levels in Covishield
COVAXIN
Bharat Biotech has released the results from the phase 3 clinical trials of Covaxin after evaluation of 130 confirmed cases. Covaxin's demonstrated an overall efficacy of 77.8% against symptomatic COVID-19 and 65.2% against the Delta Plus variant.
SPUTNIK V
This vaccine can protect people from every variant of the Covid-19 virus, whether it is the UK variant or India's Delta variant. Sputnik has been approved in India along with Covishield and Covaxin
MODERNA
The Moderna vaccine is effective against the new variants of SARS-CoV-2, including the Alpha variant, also known as B.1.1.7 and the beta variant (501Y.V2). The vaccine has been found to also produce protective antibodies against the delta variant.

IMPORTANT FINDINGS

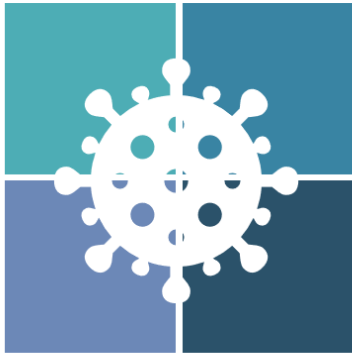
01	<p>The vaccines were protective for those who got both doses but were less so among those who got one dose.</p>
02	<p>COVID-19 vaccines made by AstraZeneca and the Pfizer-BioNTech alliance remain broadly effective against Delta and Kappa variants of the COVID-19 causing virus, which were first identified in India, according to a scientific study.</p>
	03 <p>In a research study, among the five infected with the Delta plus variant, three were fully vaccinated and show mild or no symptoms, there was no need of hospitalisation, which means the vaccine is effective against the new variant. Not much is known about the effectiveness of vaccines against Delta Plus as it is only an emerging variant. It has been found that Delta Plus is resistant to the monoclonal antibody cocktail treatment for covid-19, which was recently authorized in India. But this does not tell anything about its response to Covid-19 vaccines yet.</p>

IV. ASSESSMENT

The Delta plus variant also has been declared as a Variant of concern by the Government of India considering that the viral strain is a descendent of the Delta variant. Considering the fact that the predecessor delta variant played a major role in the devastating second wave experienced in India, it would be wise to take up the advises provided by experts. The new delta plus variant of the SARS-CoV-2 virus could prove to be a main factor for the upcoming third wave, however, a stringent watch and control could be essential in the war against this virus.

The major concern lies with the fact that the vaccination drives have influenced a laid-back mentality among the general public, there have been increased frequencies of social gatherings, and poor hygiene management- many do not wear masks, wear them improperly and also fail to maintain social distancing. This has also brought up an increase in anxiety among policy makers, public and an already overburdened health industry.

Studies such as one by IIT Kanpur team of Professor Rajesh Ranjan and Mahendra Verma suggest three possible scenarios during the third wave using the epidemiological parameters of the second wave. Assuming that India is fully unlocked on 15 Jul:

**SCENARIO 1 (BACK-TO-NORMAL)**

Third wave peak in Oct but a lower peak height than the second wave.

SCENARIO 2 (NORMAL WITH VIRUS MUTATIONS)

The peak could be higher than the second one and may appear early (Sep).

SCENARIO 3 (STRICTER INTERVENTIONS)

The peak of the third wave could be delayed until late Oct with strict social distancing. Here, the peak will be lower than the second wave

NORTHEAST STATES

An observation that was stated, the impact of second wave has decreased significantly across the country except in some Northeast states (Mizoram, Manipur, Sikkim etc.), according to an assessment from the same team.

Model projections such as these are, however, subject to several uncertainties, and it remains important to prioritize scale up of vaccination coverage to mitigate any casualties. Being prepared and thorough planning for any potential future wave is prudent even if it seems unlikely that the third wave might be as severe as the second wave. Preparation will be key- systematic contact tracing, genome sequencing, quarantine and restricting the spread of the variant when it still remains to be localized along with widespread organized and COVID-19 protocol regulated vaccination drives would be the way forward.

ANNEXURE

DETAILS OF STATES IN INDIA AFFECTED BY DELTA PLUS VARIANT

STATE	CASES	DEATHS	DISTRICTS	ACTION BY THE STATE GOVERNMENT
Maharashtra	22	1	Jalgaon, Sindhudurg, Ratnagiri, Navi Mumbai, Thane and Palghar	More samples have been sent for genome sequencing to understand whether the new variant is dominant or scattered (100 per district). The state government has tightened restrictions with effect from Monday (28 June 2021), allowing essential shops to remain open only till 4 pm on all days. The entire state has been put under 'level 3' restrictions.
Tamil Nadu	9	1	Madurai, Kanchipuram and Chennai	Contacts of all the nine people who were infected by the delta plus variant of COVID-19 are being monitored. As a preparation for the third wave, a post-recovery treatment clinic for COVID-19 is being set up at the King's Institute in Guindy.
Madhya Pradesh	7	2	Bhopal, Ujjain, Raisen and Ashok Nagar	None of the contacts was found to be infected with this variant. The Medical Education minister further said the state has decided to set up a laboratory in Bhopal for genome sequencing, so that people infected with different mutations of coronavirus can be detected at the earliest.
Kerala	3	-	Palakkad and Pathanamthitta	The Health Minister has stated that more tests would be carried out in grama panchayats and neighbouring Parali and Pudupariyaram where the variant was confirmed.
Karnataka	2	-	Mysore and Bangalore	<p>The Health Minister K Sudhakar said the state government is carefully monitoring the emergence of new variants and it has decided to set up six genome labs in the state. Karnataka is conducting about 1.5 lakh to two lakh COVID-19 tests daily. He said the government is sending vaccines to all the districts wherever there is suspicion of Delta Plus sequencing.</p> <p>On the preparedness to deal with the third COVID wave, which is believed to affect children, the</p>

				Health Minister further said preparations are afoot to set up pediatric wards with ICU and appoint doctors and nurses within 45 days in all the districts.
Punjab	2	-	Patiala and Ludhiana	The state is keeping vigil and random sample testing will continue to trace and keep tabs on the variant.
Gujarat	2	-	Surat	The state has been advised to take immediate containment measures in Surat and other places where clusters of Delta variant have been found. Maharashtra administration also revealed that out of the total persons identified in Maharashtra to be infected with Delta Plus variant, two had a travel history to Surat.
Andhra Pradesh	1	-	Tirupati	Chittoor District Medical and Health Officer stated that they have conducted a house-to-house fever survey in the marked area and found that everyone there was doing good. The DM&HO further said the district health machinery was put on alert about the threat posed by the new variant.
Odisha	1	-	Deogarh	The state government had undertaken contact tracing of the infected person and the health condition of all of them will be examined again. The team will also verify the vaccination status of the people who have come in contact with the patient.
Rajasthan	1	-	Bikaner	The state is taking all preventive measures to rule out the presence of any chain of the virus infection.
Jammu and Kashmir	1	-	Katra	Jammu Government Medical College (GMC) principal reported that they are regularly sending samples (to National Centre for Disease control, Delhi) for genome sequencing. She even urged people to strictly follow COVID-19 appropriate behaviour as there can be no laxity and it is a priority to stop the transmission chain of the new variant and to finish it in its host.

Haryana	1	-	Faridabad	The state government has given orders that all the contacts of the delta plus positive person be tested and genome sequencing be done.
Himachal Pradesh	1	-	Kangra	A 19-year-old woman from Gopalpur in Palampur sub-division of Kangra had tested positive for Covid-19 on May 25. Her sample has come back positive for the Delta Plus variant of Covid-19

ABOUT THE AUTHORS

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Prepared at the Risk Assessment and Analysis Centre, Bangalore

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