

The Delta Variant of the SARS-CoV-2

First published on 28 June 2021 by Pandemic Scientific Response team, Clinical Research Unit (CRU), UPM Teaching Hospital

Caution: Summary is a preliminary report of work by Pandemic Scientific Response team. It will be continuously updated in accordance to the unfolding of events and emerging of scientific evidence.

In Brief

- The Delta variant (B.1.617.2) is very transmissible, estimated to be > 60% more infectious than the Alpha variant (B.1.1.7), which in turn was about 50% more transmissible than the ancestral Wuhan strain.
- The most commonly reported symptoms are headache, runny nose/sneezing and sore throat.
- Patients infected with the Delta variant have twice the likelihood of being hospitalized, compared to Alpha variant.
- Available reports have not observed the Delta variant causing more severe cases of COVID-19 and deaths.
- AstraZeneca's or Pfizer's vaccines remain effective against symptomatic infection (up to 33% after 1st dose, up to 88% after 2nd dose) and hospitalization (up to 94% after 1st dose, up to 96% after 2nd dose) due to the Delta variant.
- Vaccination and preventing the spread of the virus and against it are the 2 key preventive strategies of new variants.
- To reduce the impact of Delta infection, practice frequent hand washing, wearing mask (double up), practice physical or social distancing, ensure good ventilation of indoor spaces and avoid gathering at crowded places or closed settings (open up and/or filter out).

PANDEMIC SCIENTIFIC RESPONSE TEAM

is a working group in Clinical Research Unit (CRU), HPUPM.

This team is to collect, digest and making sense of emerging scientific and research evidence about the pandemic Covid-19, the SARS-CoV-2 and its variants, diseases and complications caused by them, vaccines and treatments available to battle with the virus. The team would produce timely briefs and summaries on emerging evidence worthy of attention for all clinicians and healthcare staff.

The expert team members are:

Associate Professor Dr. Chew Boon How,
Dr. Aidalina Mahmud,
Associate Professor Dr. Chee Hui Yee,
Associate Professor Dr. Malina Osman &
Associate Professor Dr. Chin Yit Siew.

The administrative staffs are:

Faridzatul Syuhada Abdul Rashid
Intan Basirah Abd Ghani



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What is the Delta variant?

The SARS-CoV-2 Delta variant (B.1.617.2) was first identified in India.

The Delta variation has mutations in the spike protein that change how it interacts with the ACE2 receptor protein, which is found on the surface of lung and other human cells and serves as the cell's gateway. The mutation at position L452R in the spike protein appears to make the virus more transmissible. The spike protein has been mutated to help the virus to adhere to the cell more tightly.

Why is the Delta variant important?

The Delta variant is known as a Variant of Concern (VOC), which means "there is evidence of an increase in transmissibility, more severe disease (e.g., increased hospitalizations or deaths), significant reduction in neutralization by antibodies generated during previous infection or vaccination, reduced effectiveness of treatments or vaccines, or diagnostic detection failures"². However, till now, there are no more severe cases of COVID-19 and deaths rising at the same rate as the hospital admissions due to the Delta variant. The common presenting symptoms have changed to headache, runny nose/sneezing and sore throat in the UK when the dominant SARS-CoV-2 variant is the Delta³.

In addition, VOCs concern might require one or more appropriate public health actions, such as notification to WHO under the International Health Regulations, reporting to CDC, local or regional efforts to control spread, increased testing, or research to determine the effectiveness of vaccines and treatments against the variant. Based on the characteristics of the variant, additional considerations may include the development of new diagnostics or the modification of vaccines or treatments².

The situation of Variants of Concern (VOC) and Variants of Interest (VOI) in Malaysia (as of 22 June 2021)

Jadual 2: Bilangan kes positif COVID-19 dengan VOC dan VOI mengikut negeri sehingga 22 Jun 2021

Negeri	VOC						VOI						Jumlah	
	Alpha B.1.1.7		Beta B.1.351		Delta B.1.617.2		Kappa B.1.617.1		Theta P.3		Eta B.1.525		Import	Tempatan
	Import	Tempatan	Import	Tempatan	Import	Tempatan	Import	Tempatan	Import	Tempatan	Import	Tempatan		
Selangor	2	3	-	45	2	-	1	-	-	-	-	-	5	48
Kelantan	-	-	-	24	-	-	-	-	-	-	-	-	-	24
Sarawak	-	-	-	7	-	-	-	-	-	12	1	-	1	19
WP Kuala Lumpur	3	-	-	8	1	3	-	-	-	-	2	-	6	11
Kedah	-	-	-	13	-	-	-	-	-	-	-	-	-	13
Perak	-	-	-	12	-	-	-	-	-	-	-	-	-	12
Johor	-	-	-	8	1	2	-	-	-	-	-	-	1	10
WP Putrajaya	-	-	-	3	-	2	-	-	-	-	-	-	-	5
Terengganu	-	-	-	4	-	-	-	-	-	-	-	-	-	4
Negeri Sembilan	-	-	-	2	-	3	-	-	-	-	-	-	-	5
Sabah	-	1	-	4	-	-	-	-	-	-	-	-	-	5
Perlis	-	-	-	4	-	1	-	-	-	-	-	-	-	5
Pulau Pinang	-	-	-	5	1	-	-	-	-	-	-	-	1	5
Melaka	-	-	-	3	-	-	-	-	-	-	-	-	-	3
WP Labuan	-	-	-	0	4	2	-	-	-	-	-	-	4	2
Pahang	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jumlah	5	4	0	142	9	13	1	0	0	12	3	0	18	171
Jumlah Keseluruhan	9		142		22		1		12		3		189	
			173						16					

Source: Ministry of Health, Malaysia

Increased transmissibility

The Delta variant is 60% more transmissible than the Alpha variant (also called B.1.1.7), which in turn was about 50 percent more transmissible than the ancestral Wuhan strain¹.

This was based on a study by Kall et al (2021), which used UK national surveillance data (March to May 2021) of 3,765 genomically sequenced index cases in household clusters matched to 7,530 sporadic index cases, found that the odds ratio of household transmission was 1.64 among Delta variant cases (95% CI 1.26-2.13, p < 0.001) compared to Alpha cases after adjusting for age, sex, ethnicity, index of multiple deprivation (IMD) and vaccination status of index case¹.

Higher likelihood of hospital admission⁴

People infected with Delta are about twice as likely to end up in hospital.

A study in Scotland suggests that people infected with Delta are about twice as likely to end up in hospital, compared with those infected with Alpha. In that study, Delta variant cases were associated with an increased risk of COVID-19 hospital admission: hazard ratio (HR) 1.85 (95% CI 1.39-2.47) when compared to Alpha cases, after adjusting for age, sex, deprivation, temporal trend, and comorbidities, and greater number of COVID-19 relevant comorbidities increased the risk of COVID-19 hospital admission⁴.

How to control the impact of the Delta variant?

Regardless type of strain and its potential impact; as vaccination may take time, conservative public health measures remains as the most important step at this stage. Proper public health measure should ALWAYS in place particularly at work settings, even though we are surrounded by familiar friend or closed colleagues.

Public health measures

Stopping the spread at the source remains key.

Current measures to reduce transmission – including frequent hand washing, mask wearing (doubled up⁷), physical or social distancing (furthered up⁸), good ventilation of indoor spaces and avoiding crowded places or closed settings (opened up and/or filtered out⁹).

Vaccination

Vaccination is still effective in reducing the impact of the Delta variant infection, especially after the second dose.

A single dose of either Oxford-AstraZeneca (AZ) or Pfizer-BioNTech (Pfizer) COVID-19 vaccines reduced a person's risk of developing COVID-19 symptoms caused by the Delta variant by 33%, while 2 doses provided a higher percentage of protection.

A preprint study by Bernal et al (2021), which investigated the effectiveness of the Pfizer and AZ vaccines against Delta variant, found that effectiveness against symptomatic illness after 1 dose of vaccine was 33.5% for both vaccines. However, a second dose of the AZ vaccine boosted protection against Delta to 59.8% (95%CI: 28.9 to 77.3), while after two doses of Pfizer vaccine, the effectiveness was 87.9% (95%CI: 78.2 to 93.2)⁵.

Similarly, results of a study in Scotland on vaccine effectiveness in preventing RT-PCR-confirmed SARS-CoV-2 infection, showed that at at least 14 days after the second dose, the Pfizer vaccine's effectiveness was 79% (75-82) for the cases of Delta variant, while the AZ vaccine, its effectiveness was 60% (53-66)⁴.

As for hospitalization, a study by Stowe et al (2021) showed that the Pfizer vaccine effectiveness against hospitalisation was 94% (46-99) after 1 dose and 96% (86-99) after 2 doses, while for AZ vaccine, it was 71% (51-83) after 1 dose and 92% (75-97) after 2 doses⁶.

Therefore, even fully vaccinated people should continue to wear mask and practice other COVID-19 pandemic safety measures.

Summary

The risk of a virus mutating increases when it is widely circulating in a community. The more chances a virus has to spread, the more it replicates – and the more mutations it might go through¹⁰.

Ensuring equitable access to COVID-19 vaccines is more critical than ever to address the evolving pandemic. As more people get vaccinated, we expect virus circulation to decrease, which will then lead to fewer mutations. Diligently practicing the SOPs that we already have is also more crucial than ever, now.

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