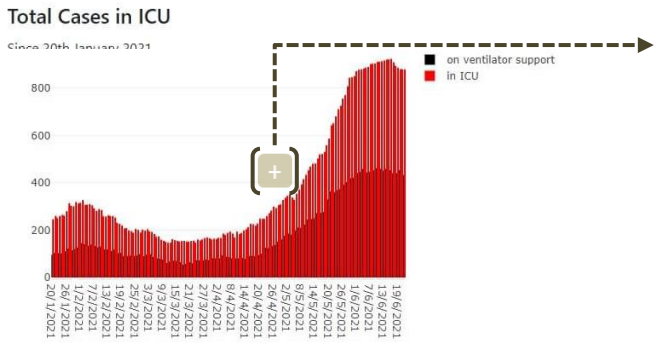
COVID-19 Variants

WHAT to concern & HOW they raise?

Upsurge ICU Cases in Malaysia



NOTES

- Exponentially increased of ICU cases in Malaysia since May 2021
- Increased cases of COVID-19 variants in Malaysia, especially Indian variant Delta

4 Notable Variants to be Concerned

Alpha (B 1.1.7)

• First emerged in the UK, at Sep 2020 • 50% more transmissible

Beta (B 1.351)

• First identified in South Africa, in May 2020 • Increased in hospitalizations & deaths

Gamma (P.1)

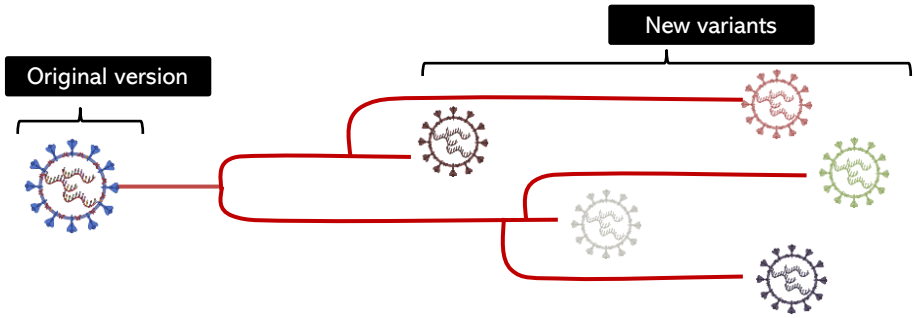
• First identified in Brazil, in Nov 2020 • Increase possibility of re-infection
• Decrease the effectiveness of vaccine

Delta (B 1.617.2)

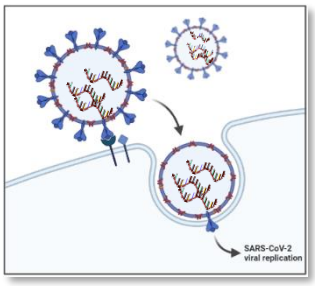
- Delta & Delta Plus: The most concerning variant worldwide, now is causing upsurge cases worldwide
- First identified in India, at Oct 2020
- 60% more transmissible
- Vaccine is less effective to this variant
- Delta Plus: Mutated variant of Delta, a more virulent and deadlier variant as compared to Delta

Among them, the reported cases of Alpha, Beta, & Delta had seen in Malaysia

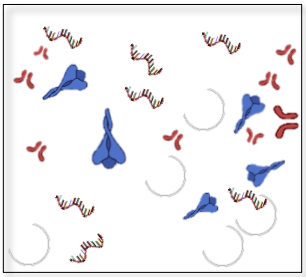
New COVID-19 variants are developed from MUTATION of RNA (viral genetic code)



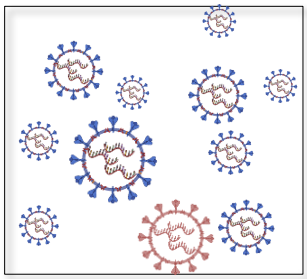
What is MUTATION?



REPLICATION → 1



ASSEMBLE → 2



SARS-CoV-2 invades human cell and inject its RNA as a blueprint to replicate the viral components

The virus assembles to form many copies of itself

Mutation occurs when there is mistake during RNA REPLICATION

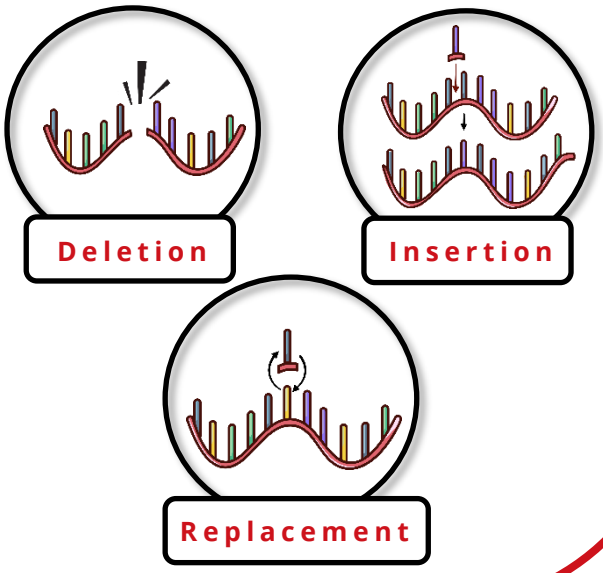
Mistakes

- 99.9% replicate is correct
- **BUT,** 0.1% of mistakes in coding RNA

0.1% mutations

- ❑ Possibility to become weaker & disappear
- ❑ Possibility to become stronger & infect more people

Types of MUTATION



MUTATION Changes Properties of VIRUS

Transmissibility & ease of spread

Severity of the disease

Detectability & diagnosis

Effectiveness of treatments

REFERENCE: (1) Nature. (2021). Delta coronavirus variant: scientists brace for impact. Retrieved https://www.nature.com/articles/d41586-021-01696-3, 24th Jun 2021. (2) Pathan, R. K., Biswas, M., & Khandaker, M. U. (2020). Time series prediction of COVID-19 by mutation rate analysis using recurrent neural network-based LSTM model. Chaos, Solitons & Fractals, 138, 110018. (3) Centers for Disease Control and Prevention. (2021). SARS-CoV-2 Variant Classifications and Definitions. Retrieved https://www.cdc.gov/coronavirus/2019-ncov/variants/variant-info.html, 24th Jun 2021.

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