Incubation periods of the 3 major COVID-19 variants in Singapore

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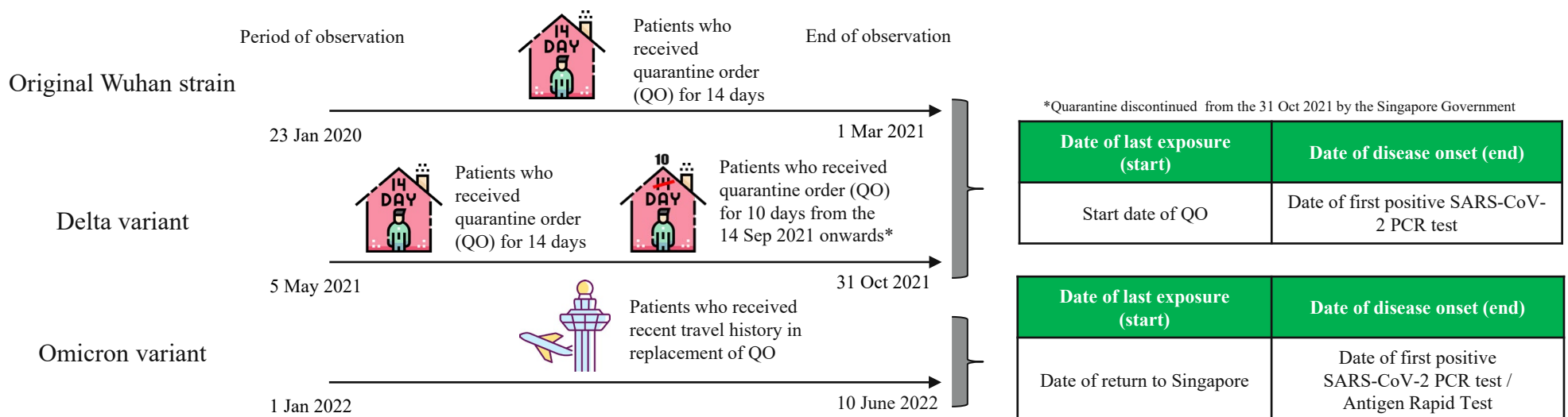
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Background

- Containment of infected or potentially infected persons with COVID-19 is a key strategy for controlling the COVID-19 pandemic.
- In the initial phases of the pandemic in Singapore, close contacts of confirmed cases were subjected to a 14-day quarantine with a mandatory entry and exit SARS-CoV-2 PCR test done at 11-14 days post-exposure (if asymptomatic) or at onset of respiratory symptoms.
- The time-frame for contact tracing and quarantine is determined by the incubation period.
- As the pandemic progresses, different variants may have different characteristics including incubation period, which would have implications on outbreak control measures.
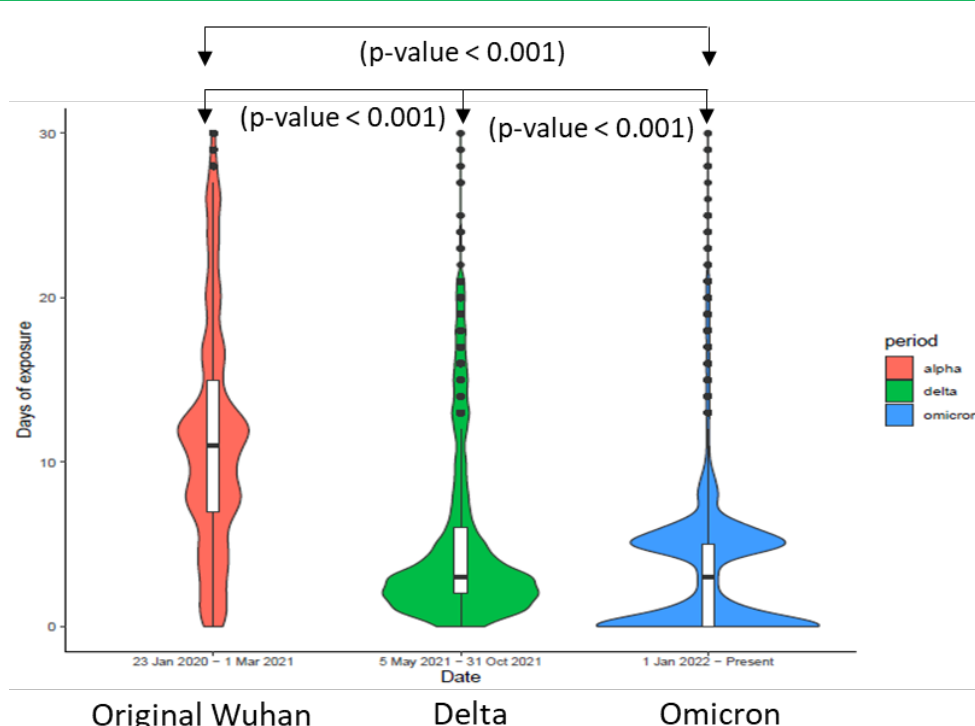
Aim

- To determine and compare the incubation periods of the 3 major SARS-CoV-2 variants in Singapore.

Methods

- SingHealth cluster-wide COVID-19 registry, of confirmed COVID-19 patients with encounters at any of 4 acute hospitals and 9 polyclinics in SingHealth, from 23 Jan 2020 – 10 June 2022.
- Prevalent variants in circulation based on data from Global Initiative on Sharing Avian Influenza Data (GISAID).
- Wild type + variants of concern (VOCs) defined by World Health Organization (WHO) were considered.

*Quarantine discontinued from the 31 Oct 2021 by the Singapore Government

Date of last exposure (start)	Date of disease onset (end)
Start date of QO	Date of first positive SARS-CoV-2 PCR test

Date of last exposure (start)	Date of disease onset (end)
Date of return to Singapore	Date of first positive SARS-CoV-2 PCR test / Antigen Rapid Test

Results and Discussion

Variant	Wuhan	Delta	Omicron
Number of patients infected	8189	3046	6503
Incubation period, median (IQR)	11 (7 – 14) days	3 (2 – 4) days	3 (0 – 5) days

- Shorter incubation periods for Delta and Omicron variants
  - Changing viral characteristics
  - Changing host factors (e.g. vaccination, prior infection)
- 2 peaks for Omicron variant
- Limitations
  - Changing infection control measures
    → Changing definition of last exposure
    → Reduce accuracy and comparability
- Travellers in Omicron wave likely have an earlier date of last exposure than date of arrival in Singapore
- Some travellers might also have contact after arrival in Singapore

Conclusion

The Delta and Omicron variants had significantly shorter incubation periods compared to the wild-type Wuhan variant.
The results show the need for robust isolation policies that adjust to the changing variants in circulation.