Supplemental Online Content


*eMethods*

This supplemental material has been provided by the authors to give readers additional information about their work.
Based on administrative records used by the Ministry of Health to issue invitations for boosters and monitor vaccine uptake, there were 1,012,421 individuals residing in Singapore who were 60 years of age or older. Given the progressive roll-out of these invitations, we included 706,286 individuals who were eligible to receive booster vaccination until October 15, 2021 (i.e. who had received 2 doses of vaccines before May 18, 2021). We further restricted the participants to those who received only two mRNA vaccines (and not more) before September 1, 2021. We also excluded those who were infected before September 1, 2021, as these individuals were not eligible for the booster vaccinations.

Our study examined the PCR-confirmed cases at the beginning of the booster vaccine campaign from September 15, 2021 to October 31, 2021 among individuals included in our study. Due to potential delays in the development of severe illness, data on severe conditions were extracted on November 7, 2021 for confirmed cases until the October 31, 2021 notification date.

We analyzed the infection and severe disease rate amongst participants who received the booster dose (booster group) and those eligible for receiving their booster doses but only received two vaccine doses (non-booster group), by type of vaccine received for the primary series (BNT162b2 or mRNA-1273). Individuals were classified under the booster group if they received a booster dose at least 12 days prior to the study period. The minimum interval of 12 days was set to allow adequate time for antibody levels to increase after immunization, and to account for the incubation period for infection, as well as delays in PCR testing and reporting of PCR-confirmed cases. Previous studies have shown substantial increase in antibody levels among participants at least seven days after the second dose of vaccine, and the median incubation period of the currently predominant B.1.617.2 (Delta) variant to be approximately four days. While the mean reporting delay in Singapore was estimated to be 6.4 days (95% CI, 5.8 to 6.9) at the start of the pandemic, this delay has been much reduced because of our increased testing capacity. We chose an interval of 12 days to take into account an antibody build-up period of approximately 7 days, with another 5 days for the incubation period and delay in detection.
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