






LETTERS



## Impact of SARS-CoV-2 delta variant (B.1.617.2) in surging second wave of COVID-19 and efficacy of vaccines in tackling the ongoing pandemic

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We are sharing the results of our study which retrospectively looked at the impact of SARS-CoV-2 delta variant amid coronavirus disease 2019 (COVID-19) ongoing pandemic.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) delta variant (also known: B.1.617.2) is a variant of SARS-CoV-2 that was identified in late 2020 in India, and has been classified as variant of concern (VOC). According to the Centers for Disease Control and Prevention (CDC) (<https://www.cdc.gov/coronavirus/2019-ncov/variants/variant-info.html#Concern>), VOC is “a variant for which there is evidence of an increase in transmissibility, more severe disease (e.g., increased hospitalizations or deaths), a significant reduction in neutralization by antibodies generated during previous infection or vaccination, reduced effectiveness of treatments or vaccines, or diagnostic detection failures.” The delta variant rapidly spread during second wave of COVID-19 in India, and it has now spread to 78 countries.<sup>1–4</sup> More than 4,500 variant sequences were identified in around 78 countries by June 22, 2021. Data from the Integrated Disease Surveillance Program (IDSP) of the Indian government revealed that about 32% of patients with COVID-19 in both hospitalized and outdoor hospitals were less than 30 years of age in the second wave, 31% in the first wave. The infections among both waves among adult’s ages 30–40 years are still remains similar at 21%. Hospitalization with 20–39 years patients grew from 23.7% to 25.5%, while the range 0–19 years increased by 4.2% to 5.8%. The results also demonstrated that more asymptomatic individuals had higher breathlessness complaints in this second wave. According to the Phylogenetic Assignment of Named Global Outbreak Lineages (PANGOLIN), 77,544 delta variant cases were reported, whereas UK was in top of the list (103198).<sup>5–7</sup> The variant seems to cause extremely serious symptoms, including stomach discomfort, nausea, vomiting, lack of appetite, hearing problems and joint pain which was described by six doctors of India.<sup>7</sup> India reported a high surge in cases of COVID-19 after detecting delta variant, whereas most cases and deaths were over one-half million (May 6, 2021) and more than 6000 (June 9, 2021), respectively.<sup>8</sup> India

is second worldwide with 30 million COVID-19 cases, behind the United States (34 million). With 409,338 COVID-19-related deaths, India ranks third in the globe, behind the United States (623,029) and Brazil (534,311).<sup>7</sup> According to Matt Hancock (the British health secretary), the delta variant now accounts for 91% of new cases in the UK, which currently dominates in the UK, displacing B.1.1.1.7, previously known as the alpha strain.<sup>7</sup> As a neighboring country of India, Bangladesh also reported 43 cases of delta variant according to the PANGOLIN.<sup>6</sup> The higher transmissibility of the delta variant and ability acquired to cause more severe disease than alpha variant is reflected with a surge in cases with rise in the percentage of positive cases that require hospitalization.

The continuation of the spread of highly transmissible SARS-CoV-2 delta variant emphasizes the importance of obtaining COVID-19 vaccination, although two doses were identified as necessary to provide protection and block the spread of delta variant.<sup>7,9</sup> It is crucial to accomplish the two-shots of Pfizer or Moderna vaccination.<sup>10</sup> The Pfizer (BioNTech) vaccination was reported to be more than 95% effective in reducing COVID-19 in people who’ve never been infected. On the other hand, Moderna’s vaccine was found to be 94.1% effective in avoiding symptomatic infections for those who had no previous COVID-19 infection. AstraZeneca has shown 76% efficacy in lowering the probability of symptom 15 days after taking the two doses and 85% in preventing COVID-19 in patients over 65.<sup>11</sup> In April and May, the British government undertook a study that reviewed more than 12000 SARS-CoV-2 sequencing cases and found that the vaccination with the Pfizer or AstraZeneca vaccine showed high efficacy in preventing COVID-19 delta disease. However, the adverse impact of delta variant on vaccine efficacy was higher than the alpha variants. The Pfizer vaccine gave about 33% protection against the delta variant after just one dose. According to the study, two weeks after the two doses, the Pfizer vaccination was 88% effective against symptomatic illness, whereas the AstraZeneca vaccine was 60% effective.<sup>7,10</sup> Hence two doses of vaccines work well to counter

delta variant.<sup>9,10</sup> The Ministry of Health of Israel announced on 6 July that the Pfizer vaccination was slightly less efficient than prior projections, while 64% efficacy was found after 2 doses. In contrast, Canada reported 87% efficacy for Pfizer vaccination, while 72% for Moderna vaccine.<sup>12</sup>

Vaccination is necessary to prevent the virus from spreading and the emergence of new variants.<sup>9,10</sup> It is estimated that more than 2.3 billion vaccine shots have been given, which would be enough to vaccinate 15% of the world's population completely.<sup>13</sup> According to the recent survey data, almost two-thirds of infected persons and more than half of those who died with the delta variant had never received a COVID-19 vaccine.<sup>9,10</sup> The partially vaccinated population could pose the continuous risk of more people being infected by the virus, which might render further events of meaningful mutations driving delta variant to possibly evade vaccine-induced immunity to a greater degree. The longer it will take to vaccinate the entire continent and the world as a whole, the higher the chance that the virus may keep mutating. Therefore vaccination drive need to be enhanced at a very high level by ramping up of vaccine production and rolling out vaccines as quickly and widely as possible while countering the barriers of vaccine hesitancy and making equitable access of vaccines to all the countries so that majority of global population gets fully vaccinated with two doses of vaccines.<sup>10,14</sup>

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## Author contributions

AMT, TBE, and KD conceptualized the manuscript. AMT, TBE, and KD wrote the first draft with input from MD. TBE, KD, MD, and TET reviewed and updated the manuscript. All authors contributed to revisions and approved the final manuscript.

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