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COVID-19 Literature Review Group

Prepared by The Ohio State University

Variants of COVID-19 and COVID-19 Vaccine Hesitancy

ODH Literature Review Group
THE OHIO STATE UNIVERSITY

COVID-19 Literature Review
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Topic: Variants of COVID-19

Title: How Dangerous is the Delta Variant, and Will it Cause a COVID Surge in the U.S.?
Source: Scientific American
Publication Date: June 29, 2021
Link: https://www.scientificamerican.com/article/how-dangerous-is-the-delta-variant-and-will-it-cause-a-covid-surge-in-the-u-s/
Study Period: N/A
Study Location: N/A
Sample Size: N/A
Summary: The Centers for Disease Control and Prevention (CDC) had identified the Delta variant, first discovered in India, as a variant of concern. Officials worry that the variant may lead to new COVID-19 surges in the United States, particularily in areas where a large proportion of the population have not yet been fully vaccinated. Studies suggest that the Delta variant is between 40-60% more transmissible than the Alpha variant, which was 50% more transmissible than the original strain first detected in Wuhan, China. Prior to the Delta variant, the Alpha variant was the most common in the United States. As of June 30th, estimates suggest that Delta is now the dominant variant. A study in Switzerland has indicated that the Delta variant may result in more severe cases. Hospitalization rates among patients with the Delta variant were about 85% higher than that of people with the Alpha variant. Due to a time lag between hospitalizations and death, there is not enough evidence to determine if the Delta variant is more deadly in comparison to other variants.

Vaccinations appears to provide good protection against the variant. However, one dose appears to offer less protection than it did against other variants. For example, studies have shown that 2 doses of the Pfizer vaccine was 96% effective in preventing hospitalizations among people infected with the Delta variant. One dose of Pfizer was about 33.5% effective against symptomatic COVID from the variant. Experts do not expect another nationwide surge in the United States similar to the previous year. However, they do anticipate localized outbreaks in places where vaccination rates remain low. Vaccination remains the best tool for combatting and preventing a Delta variant surge.

Key Findings Relevant to Ohio's Response: Officials should continue prioritizing vaccination rates in communities where there are low rates of full vaccination. Incentives for vaccinations should target those ages 18-29, due to there being higher rates of vaccine hesitancy among that population.

Title: AZD1222-induced neutralizing antibody activity against SARS-CoV-2 Delta VOC
Source: The Lancet
Publication Date: June 28, 2021
Link: https://doi.org/10.1016/S0140-6736(21)01462-8
Study Period: N/A
Study Location: London, UK
Sample Size: N/A
Summary: This article discusses how the SARS-CoV-2 B.1.617.2 Delta variant of concern (VOC) continues to produce a sharp increase in COVID-19 cases in the United Kingdom (UK), with a current doubling time of 3·5–16 days, consistent with previous pandemic waves during 2020–21, and a sustained increase in the reproduction number (R) to 1·2–1·4**.** The ChAdOx1 nCoV-19 (AZD1222, Oxford–AstraZeneca) vaccine is the UK's primary vaccine. In order to determine B.1.617.2 sensitivity to AZD1222-induced neutralizing antibodies (NAbs) and to compare this to our previous measurements of NAbs induced by BNT162b2 (Pfizer–BioNTech), researchers carried out a second initial analysis of Legacy study participants vaccinated with AZD1222. Results from their analyses confirmed that vaccine type was associated with decreased NAbTs, independent of SARS-CoV-2 strain, in two-dose vaccine recipients. In addition, researchers found that a previous history of COVID-19 symptoms was associated with increased NAbTs, independent of SARS-CoV-2 strain, in single-dose AZD1222 recipients. Overall, findings suggest that the correlation between NAbTs and vaccine efficacy in recent models continues to perform well across different vaccine types and SARS-CoV-2 variants (appendix p 5). The data reinforces the need to acknowledge the increased protection offered by a second vaccine dose as COVID-19 cases associated with the B.1.617.2 variant increases. Additional booster vaccinations may be needed, particularily for more susceptible groups that have received a vaccine that induces lower than average NAbTs.

Key Findings Relevant to Ohio's Response: Public officials should continue encouraging the general public to receive both doses of the vaccine. For optimal protection against VOCs, people who have access to 2 dose vaccines (Pfizer and Moderna), should receive both doses. Single dose vaccines may not be as protective.

Topic: Vaccine Hesitancy

Title: Evidence-Based Strategies for Clinical Organizations to Address COVID-19 Vaccine Hesitancy
Source: Mayo Clinic
Publication Date: March 2021 (96(3):699-707)
Link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7772995/
Study Period: N/A
Study Location: N/A
Sample Size: N/A
Summary: This article focuses on reviewing, summarizing, and encouraging the use of interpersonal, individual-level, and organizational interventions within clinical organization in order to improve population adoption of the COVID-19 vaccine. Vaccine hesitancy threatens to undermine the success of COVID-19 vaccination programs. Factors associated with COVID-19 vaccine hesitancy mimic factors that are known to influence vaccine hesitancy for other vaccines. These factors include vaccine-related attributes, vaccine-related attitudes and beliefs, and political factors. The uncertainty about the immunology and virology of COVID-19, in addition to the rapid vaccine development, can be attributed to lack of confidence in the vaccine to the general public. Data from public surveys in the United States indicated that the influence of political factors on hesitancy wherein lack of trust in those endorsing vaccination, country of vaccine origin, and concerns about profit or political motives increase public mistrust as well. On the individual level, general mistrust of the vaccine and misperceptions about the severity of disease contribute to hesitancy.

Evidence-based efforts from social, behavioral, communication, and implementation science can inform clinical efforts at the interpersonal, individual, and organization levels to address COVID-19 vaccine hesitancy and support public health efforts. Interventions at the policy and community level do not directly address vaccine hesitancy, but they set the stage for interventions to address vaccine hesitancy within clinical organizations. Interpersonal-level interventions deal with the interactions between clinicians and patients. Effective interpersonal strategies that clinicians can use to increase vaccine uptake include making strong recommendations to patients and use of presumptive announcement-style language. Individual-level interventions focus on members of a healthcare team and patients. When combined with interventions at the organization and interpersonal level, individual-level educational interventions can enable health care teams to promote vaccination and optimize efforts to address hesitancy among patients. In order to offer recommendations to their patients, clinicians must be adequately educated about evidence supporting COVID-19 vaccination, such as information regarding vaccine efficacy, safety, and reactogenicity. Effective individual strategies include offering novel information about the disease and appealing to altruism and prosocial behavior. Lastly, organization-level interventions have been found to increase vaccination rates by supporting the work of clinicians or removing barriers to vaccination for patients. Strategies for these interventions include availability of standing orders for nursing visits, audit and feedback, reminder/recall systems, point-of-care prompts, and home visits. Overall, the use of evidence-based strategies to increase vaccination uptake provides health care systems with a road map to navigate vaccine hesitancy.

Key Findings Relevant to Ohio's Response: Implementation of evidence-based strategies at the organizational, interpersonal, and individual levels in clinical organizations to increase uptake of COVID-19 vaccination is crucial in order to aid in the ending of the COVID-19 pandemic.