Happy Monday, PASPDI Members!
We hope everyone is doing well as we approach our last couple weeks of the Summer Semester!

For those who are unaware, August is National Immunization Awareness Month, which is an annual observance held to highlight the importance of vaccination for people of all ages. Of course, the conversation around vaccinations has always been prevalent and crucial regarding the health and longevity of individuals worldwide. Now, amongst a global pandemic that has affected millions of people, and taken the lives of over 600,000 individuals in the United States alone, discovering a vaccine that could slow the spread of COVID-19 and protect individuals from the current virus was critical in order to lower vast morbidity and mortality rates. This article is going to recognize the importance of vaccinations and the impact they have had on the COVID-19 pandemic thus far, as well as addressing and discussing a topic that has been extremely prevalent in the United States-- the Delta Variant.

Since the Pfizer, Moderna, and Johnson & Johnson vaccines were released in the Winter of 2020, over 340 million doses have been given, fully vaccinating roughly 160 million individuals. Due to the misconception that vaccinations make individuals immune to a virus, many people thought that once a vaccine was created, the pandemic would be over. Establishments began opening again, masks were becoming optional, and normality was seemingly becoming attainable. However, viruses are constantly changing due to mutation. When this occurs, different “variants” of the virus are created; such variants are all a little different than the original. Some variations allow the virus to spread quicker than the original, it can increase severity of infection, and it can make the virus resistant to treatment and vaccinations of which the original was once susceptible (CDC, 2021).

**COVID-19 vaccinations:**

Unlike most vaccines that introduce a weakened or inactivated version of a specific virus into the host, the COVID-19 vaccines have a different approach. These vaccines introduce strands of messenger RNA (mRNA) into the host which allow the human body to produce copies of a recognizable, harmless, virus protein. These copies are replications of “**Spike Proteins**,” which are completely pathognomonic to SARS-CoV-2.

*Figure 1: Spike Proteins:* Located on the outside of SARS-CoV-2 viruses. These proteins are how the virus enters the human body cells.
Since COVID-19 was first detected in the United States in January 2020, multiple variants of the virus have been discovered. However, four variants in particular are of "clinical concern" due to their contagiousness and higher virulence compared to other strains:

**Alpha Variant:** December 2020  
**Beta Variant:** January 2021  
**Gamma Variant:** January 2021  
**Delta Variant:** March 2021

Currently, the Delta Variant is of major concern due to its increased transmissibility, virulence, and ability to replicate. According to the CDC, the Delta Variant is equally as contagious as Chicken Pox, and more transmissible than the common cold, the 1918 Spanish flu, smallpox, Ebola, MERS and SARS (Centers for Disease Control and Prevention, 2021). Today, 82% of positive COVID-19 cases are positive for the Delta Variant, as opposed to two months ago when this number was only at 2% (Blauer, 2021). In addition, the highest spread of new cases and more severe outcomes is happening in places with low vaccination rates, and virtually all hospitalizations and deaths have been among unvaccinated individuals (Katella, 2021).

According to a recent YaleMedicine article, F. Perry Wilson, MD discussed how intense the Delta Variant is in comparison to other strains including the Alpha Variant and the original strain of SARS-CoV-2. Dr. Wilson reports the Delta Variant spreads 50% faster than the Alpha Variant, and before the Delta Variant was discovered, the Alpha Variant was spreading 50% faster than the original strain of SARS-CoV-2 (YaleMedicine, 2021). Dr. Wilson also puts these numbers into perspective by looking into an individual's typical day. In an environment of unvaccinated, unmasked individuals, it is estimated that an individual infected with the original SARS-CoV-2 strain will infect approximately 2.5 other individuals. However, someone infected with the Delta Variant, in the same environment under the same circumstances, will infect approximately 3.5-4 people (YaleMedicine, 2021).

**Figure 2:** The rapid spread of the Delta Variant throughout the United States from May 2021-June 2021 (YaleMedicine, 2021).

**Who is mostly affected by the Delta Variant?**
For starters, anyone unvaccinated is increasingly more susceptible to contracting the Delta Variant than those who are vaccinated. In addition, compared to the original SARS-CoV-2 strain that most commonly affected older populations and those with immunosuppression, the Delta Variant seems to affect younger populations more heavily. With this in mind, the proposed question is: **What about children under the age of 12 who cannot yet receive a vaccination?** This is a major concern considering the rate of transmission and spread of the Delta Variant, and the large population of adolescents who—according to the FDA—legally cannot be vaccinated. On August 1st, Dr. Heather Haq, a pediatrician at Texas Children’s Hospital in Houston, states “after many months of zero or few pediatric Covid cases, we are seeing infants, children and teens with Covid pouring back into the hospital, more and more each day… ranging in age from 2 weeks to 17 years old” (Lehner, 2021).

**Can fully vaccinated individuals still get the Delta Variant?**

Dr. F. Perry Wilson believes vaccinated individuals with immunity from the mRNA vaccine have limited chances of getting the Delta Variant; however, **breakthrough cases** are still a big possibility. According to YaleMedicine and a Public Health England analysis, the Pfizer vaccination presented as 88% effective against symptomatic cases of Delta, and 96% effective against hospitalization from Delta (YaleMedicine, 2021). In addition, Moderna shows efficacy against the Delta Variant as well, but Dr. Wilson makes it clear that breakthrough cases are possible, and CDC Director Rochelle Walensky, MD, PhD, agrees. In the same article, Rochelle Walensky, MD, PhD address the scarcity of this possibility, but informs that fully vaccinated individuals can get the Delta Variant; the individual can be symptomatic or asymptomatic, increasing the chances of transmissibility (YaleMedicine, 2021).

**What is a breakthrough case?**

According to the CDC, a breakthrough case is: “**the detection of SARS-CoV-2 RNA or antigen in a respiratory specimen collected from a person ≥14 days after they have completed all recommended doses of a U.S. Food and Drug Administration (FDA)-authorized COVID-19 vaccine**” (Center for Disease Control and Prevention, 2021).

<table>
<thead>
<tr>
<th>Hospitalized or fatal vaccine breakthrough cases reported to CDC</th>
<th>6,587</th>
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</thead>
<tbody>
<tr>
<td>Female</td>
<td>3,193</td>
</tr>
<tr>
<td>People aged ≥65 years</td>
<td>4,868</td>
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<tr>
<td>Asymptomatic infections</td>
<td>1,219</td>
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<tr>
<td>Hospitalizations*</td>
<td>6,239</td>
</tr>
<tr>
<td>Deaths†</td>
<td>1,263</td>
</tr>
</tbody>
</table>

*Figure 3: Hospitalized or fatal vaccine breakthrough cases in the United States as of July 26th, 2021 (CDC, 2021).*

**What can we do?”**

As current students and future healthcare professionals, we not only must do our part in educating those around us, but also in educating ourselves on the current status of Health Care and what is changing around us. With the amount of falsified information and misperceptions
regarding COVID-19, we can make a difference by doing appropriate research, educating others on the facts involving the pandemic, and dispelling myths regarding the virus and vaccinations.

Although there is still so much research to be done regarding this topic, and so much contradicting information being released, we are doing our best to learn and educate. We hope you will do the same!

Thank you for reading this month’s journal, and Happy National Immunization Awareness Month!

-PASPDI Board Members

References


