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Cover Story

Chained Globalisation

Pregnancy, COVID-19, and Hope for a New Vaccine

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Key Points

- For the past 10 months, COVID-19 has spread rapidly, debilitating communities, plummeting economies, and killing 1.3 million people worldwide.
- According to the CDC, pregnant women are at higher risk for severe COVID-19 outcomes compared with non-pregnant women.
- Immunisations are especially important in pregnancy, to ensure the health of both mother and the developing baby.
- Given the myriad of physiologic changes a woman undergoes in pregnancy, it is important that health agencies and healthcare providers commit to lowering the burden of coronavirus disease in pregnant mothers.

Pregnant individuals go through many physical and mental transformations during those critical 40 weeks of gestation. Preconception health and healthcare has played a role in optimising women for such a high-risk period in their lives. The most common complications of pregnancy include high blood pressure, gestational diabetes, anaemia, mental health conditions, and infections to name a few - all of which can have long lasting effects on a woman's health throughout her life course.

For the past 10 months, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread, debilitating communities, plummeting economies, and killing 1.3 million people worldwide. The United States leads with 11.2 million cases and 247,437 deaths, while India, Brazil, France, and Russia are the other top five countries struggling to contain the virus. Since reporting its first case of COVID-19 on January 29, 2020, India's numbers have risen to 8,873,541 cases and 130,503 deaths. At the end of February, the first case of COVID-19 was reported in Brazil, since rising to 5,876,464 cases, and 166,014 deaths total. The first case of COVID-19 in France was reported on January 23,2020, and the country has reported over 2,041,293 cases, and 45,122 deaths. Lastly, in Russia, since January the country has reported over 1,932,711 cases and 33,184 deaths. Out of these countries, only France and India's new coronavirus cases are trending downward (coronavirus.jhu.edu/data/new-cases). In the U.S., average daily cases are up 43% compared to the previous seven days, with 94% of U.S. jurisdictions seeing more cases.

A recent report by the Centers for Disease Control (CDC) found that pregnant women are at significantly higher risk for severe COVID-19 outcomes when compared with non-pregnant women (Zambrano et al. 2020). These outcomes included more frequent admits to the ICU, invasive ventilation, and ECMO – and the most worrying finding, a 70% increased risk for death. As coronavirus cases continue to surge, especially in the U.S. Midwest, the U.S. received its most promising update from any late-stage vaccine trial. On November 9, 2020 Pfizer and its partner, the German company, BioNTech, announced preliminary results suggesting their latest coronavirus vaccine was more than 90% effective (note: the CDC typically presents flu vaccine effectiveness (VE) at 40% to 60%) (Zimmer and Thomas 2020). Then on November 16, Moderna announced that its coronavirus vaccine was 94.5% effective. Finally, on November 18, Pfizer revealed their vaccine was now 95% effective! The race is on for the Food and Drug Administration (FDA) approval, leaving the U.S. public, healthcare providers, and political leaders all hopeful for the coverage to come. Although the vaccine won't be developed in enough time to save the country during these next critical months, it is promising for the health of future pregnant mothers everywhere.

Immunisations are especially important in pregnancy, to ensure the health of both mother and the developing baby. Currently, the CDC routinely recommends (Tetanus DiptheriaPertussis) Tdap vaccination between 27 to 36 weeks' gestation, and inactivated influenza vaccine (IIV) during flu season for all pregnant mothers

(cdc.gov/vaccines/pregnancy/vacc-safety.html; Swamy and Heine 2015). When moms are vaccinated, we have seen increases in birth weight and decreases in both preterm birth and fetal death (Zaman et al. 2008). During 2019–20, 61.2% of pregnant women received influenza vaccination, 56.6% received Tdap during pregnancy, and 40.3% received both vaccines (cdc.gov/mmwr/volumes/69/wr/mm6939a2.htm?s_cid=mm6939a2_w).

Why is this so important? Considering what we know about inequalities in male/female disease outcomes in general, we must acknowledge sex differences in immunological response. Adult females typically mount stronger innate and adaptive immune responses than males, which can lead to greater vaccine efficacy and faster clearance of pathogens, but also contributes to women's increased susceptibility to inflammatory and autoimmune diseases (Klein and Flanagan 2016). Given the myriad of physiologic changes a woman undergoes in pregnancy (increased heart rate and oxygen consumption, decreased lung capacity, a shift away from cell-mediated immunity, and increased risk for thromboembolic disease) (Vlachodimitropoulou et al. 2020; Ramsey and Ramin 2001), it is even more important that the nation's health protections agencies and healthcare providers commit to lowering the burden of coronavirus disease in pregnant mothers.

Flu virus coverage can provide insight into how U.S. citizens view the severity of communicable diseases. More unique this year is the added burden of COVID-19 during these cold, dry winter months. The 2019-20 season flu vaccination coverage among adults ≥18 years was 48.4% (cdc.gov/flu/fluvaxview/coverage-1920estimates.htm). There can be many barriers to vaccination intention and behaviour: psychological, physical, contextual, and sociodemographic. The most common barriers include vaccine hesitancy, low perceived utility of vaccination, a negative attitude towards the influenza vaccine, and few previous influenza vaccinations (Schmid et al. 2017). An October 19, 2020 Gallup poll captured Americans' attitudes on COVID-19 finding that 49% of U.S. adults say they are either very worried (10%) or somewhat worried (39%) about contracting the coronavirus. This is the lowest level of concern recorded since mid-June, when 47% said they were very or somewhat worried about it. Half of Americans say they would agree to be vaccinated "right now" if an FDA-approved vaccine was available at no cost, down from 66% when Gallup first asked Americans about it in July (Reinhart 2020). And now large majorities of both political parties in the U.S., Republicans and Democrats, say the U.S. is more divided than before the coronavirus outbreak (Mordecai and Connaughton 2020).

Some of the biggest news to hit this year were the racial/ethnic disparities in COVID-19 deaths, citing multiple social determinants of health including racism. Unfortunately, if coronavirus vaccination coverage parallels that of flu vaccination, it is likely that racial/ethnic disparities will persist in the absence of targeted interventions. In the U.S., Black children typically have lower flu vaccination coverage than children in all other racial/ethnic groups. Hispanic adults and Black adults had lower flu vaccination coverage than white adults (cdc.gov/flu/fluvaxview/coverage-1920estimates.htm; www.cdc.gov/flu/vaccines-work/vaccineeffect.htm). And although Black women made up 14.1% of women included in the Women of Reproductive Age coronavirus study, they represented 36.6% deaths overall, 26.5% of deaths among pregnant women, and 37.4% of deaths among nonpregnant women (CDC.gov). This in addition to the poor health outcomes already noted in Black, Indigenous women of color (BIWOC).

Again, it's paramount that the U.S. health protection agencies and healthcare providers commit to lowering the burden of coronavirus in pregnant mothers in the coming months and years. With a nation divided and new vaccine hope on the horizon, there are so many pieces to manage. As companies race to the finish line of clinical development, regulatory review and approval, manufacturing, and quality control, women's health physicians and other providers may start thinking of ways to better support their patients. Ob-Gyns were heavily involved in the extensive administration of H1N1 vaccine to pregnant women during the 2009 pandemic (Ramsey and Ramin 2001), and their continued efforts to increase maternal influenza vaccination resulted in coverage exceeding 50% coverage for the first time in 2012–13.Furthermore, vaccination coverage was highest among pregnant women who reported receiving a provider offer or referral for vaccination (influenza = 75.2%; Tdap = 72.7%) (Zaman et al. 2008). Facilitating culturally competent and humble conversations on pregnancy, communicable diseases, and racial ethnic disparities in vaccination can all contribute to lowering the burden of adverse coronavirus health outcomes in this high-risk population. As soon as the vaccine is safe for production, the Advisory Committee on Immunization Practices (ACIP) should make guidelines, including COVID-19 as a part of the vaccination schedule recommendations in pregnancy.

Conflict of Interest

None. ■

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