Position Statement in the Age of COVID-19

Real Time Information to Support Policy Decisions **Published 09/30/21**

COVID-19 Vaccines: Mitigating Disease and Promoting Global Health Equity

Prital Patel, MPH — Research Analyst, Horizon Scanning
Marcus Lynch, PhD, MBA — Senior Manager, Horizon Scanning Science

Many Still Lack Access to COVID-19 Vaccines while Booster Shots Become Available for Some

The COVID-19 vaccines rapidly developed and administered in the United States and other wealthy nations have demonstrated effectiveness in substantially decreasing severe disease, mortality, and SARS-CoV-2 infection rates. However, the COVID-19 pandemic continues to disrupt healthcare systems and societies around the world, with more than 4.7 million deaths worldwide.

Uncertainty persists about how long vaccines provide protection and the need for booster shots in the general population. Emerging variants further complicate these issues. Spikes in COVID-19 cases due to the highly transmissible Delta variant have prompted country health authorities, including those in the United Kingdom and Israel, to prepare for or provide booster doses to their citizens. On August 12, 2021, FDA amended Emergency Use Authorizations (EUAs) for third doses of Pfizer-BioNTech's and Moderna's mRNA vaccines for people in the United States with compromised immune systems. FDA further amended the Pfizer-BioNTech EUA on September 22, 2021, to include use of a single booster dose given at least 6 months after completing the primary series in people 65 years of age or older and those 18 to 64 years old at high risk of severe COVID-19 or serious complications due to frequent institutional or occupational exposure.

Pfizer and Moderna assert that boosters as early as 6 to 12 months after the second dose are needed to maintain high levels of immunity and to protect individuals from contracting COVID-19. However, questions remain about vaccine dosing intervals to optimize immunity in the general population. Many scientists, including officials from the Centers for Disease Control and Prevention and FDA, continue to review data to inform guidance on boosters for the general population.

The World Health Organization (WHO) asserts that vaccine manufacturers should prioritize distributing vaccines to low- and middle-income countries to help those most in need. An opinion published in *The Lancet* agrees with WHO, stating current evidence might not show an urgent need for providing boosters to the general population, because vaccine efficacy against severe disease remains high.

Breakthrough infections have led some scientists to believe variants might make herd immunity or completely blocking transmission in the population through high vaccination rates unattainable. Some vaccine experts propose that authorities should focus on reducing severe cases and deaths among vulnerable populations globally and increase vaccine access for low- and middle-income countries.

ECRI recommends health authorities seriously consider WHO's position and examine additional measures to improve global vaccine equity while the optimal dosing interval is still being defined for general populations (i.e., not high risk or high exposure). The United States has pledged to donate 1.1 billion doses (through September 2022) to lower- income countries. G7 countries have donated and shipped approximately 306 million doses as of late September 2021 to 142 countries through the Covax initiative, the worldwide vaccine-sharing program.

Maintaining sufficient immunity in vaccinated people will be crucial for managing the pandemic in any nation. However, mRNA COVID-19 vaccines continue to protect against severe disease, despite breakthrough infections. From a global perspective, more lives might be saved by vaccinating the millions of unvaccinated

and highly vulnerable healthcare workers and high-risk people in low- and middle-income countries than by administering booster shots in general populations.

Stark Disparities in Vaccine Access

About 51% of people in high-income countries have received at least one vaccine dose. For most high-income countries, vaccines are available to anyone willing to receive them. But, as of September 23, 2021, only 2.1% of low-income country residents have received a single dose. Countries, such as Haiti and DR Congo, have fewer than 0.01 doses per 100 people, while the United States, Canada, United Kingdom, and Germany have more than 100 doses per 100 people. This gap continues to widen as high-income countries order millions of booster doses before low-income countries acquire first doses for their medical staff and high-risk groups.

Inequitable vaccine distribution leaves millions vulnerable to severe complications and allows greater opportunity for infections in those with high exposure risk. Increased global vaccination may curb the emergence of new variants that could prolong the pandemic. Consider the Delta variant, first reported in India, where only 15% of the population is fully vaccinated as of September 2021. The Delta variant now accounts for 98% of all U.S. cases as of September 4, has increased hospitalizations, and is straining healthcare resources. Health officials should prioritize reexamining prevention efforts for countries with low vaccine access because COVID-19 is a global burden.

Will Immunity Hold Up Against Variants?

Growing research suggests that mRNA COVID-19 vaccines might produce long-lasting immunity. A U.K. study found the Pfizer vaccine was 88% effective against the Delta variant. Vaccines available in the United States have shown encouraging real-world efficacy. However, some indication of waning immunity has been observed. Israel's Ministry of Health reported that although vaccine efficacy against infections decreased from 94.3% in May to 64% in June and July, the Pfizer vaccine remained 93% effective in preventing severe COVID-19 and hospitalizations through July. Even in highly vaccinated populations, however, a booster does not protect everyone. Preliminary data from Israel found that giving a third dose at six months after the second dose reduced the odds of a positive SARS-CoV-2 test by 70% to 84% 14 to 20 days after the booster. A data scientist from the Israel Institute of Technology suggests that while boosters will likely slow breakthrough cases of the Delta variant, more effective measures include vaccinating people who have not received a first or second dose and maintaining social distancing and masking protocols.

Time Will Tell

Longer-term data are needed to determine the real-world efficacy and duration of protection of COVID-19 vaccines and the benefits of booster doses. Ideally, larger, multiyear studies in broader populations would generate sufficient evidence to support decisions regarding the optimal interval for boosters. Until then, health authorities must use available data to make decisions. For example, Canada uses a four-month interval between doses one and two to optimize immunogenicity and public health benefit from a finite number of vaccine doses. New intervals might prove more effective for improving global vaccine uptake in lower-income countries. Although current studies suggest boosters increase antibody levels and neutralizing ability, more data are needed to determine the appropriate interval of a third dose after completing the initial vaccine dose regimen.

Promoting Global Vaccine Equity

Most SARS-CoV-2 infections and severe COVID-19 cases occur in the unvaccinated or undervaccinated. While the world gathers additional data on the optimal vaccine dose interval that maximizes clinical and public health benefit against infection and severe disease, more consideration is needed to increase uptake in the unvaccinated domestically, as well as in healthcare workers and high-risk people in low- to middle-income countries. Wealthy nations play a key role in promoting global health equity. While booster shots might confer marginal benefit against asymptomatic or mild infections, improved vaccine access for healthcare workers and vulnerable populations in low-income nations could provide a robust primary defense for people with limited or no healthcare access. Reducing infections in these populations could also reduce the likelihood of new variants, which could profoundly affect future mitigation measures taken by wealthy nations. In time, global vaccine equity can substantially improve global population health and enhance economic opportunity in countries ravaged by disease and lockdowns. The unprecedented rapid development of COVID-19 vaccines marks a giant leap in scientific progress and distributing them justly could show the world new models for achieving global health equity.

Acknowledgment

With appreciation to Andrew Furman, MD, MMM, Executive Director, Clinical Excellence, for his technical insights and perspectives.

Learn more: **www.ecri.org**
Contact us: **evidence@ecri.org**

Policy Statement

The information contained in this Position Paper is highly perishable and reflects ECRI's position at the time this document was prepared. This Position Paper is not intended to provide specific guidance for the care of individual patients. ECRI makes no express or implied warranties regarding the products discussed herein, including any implied warranty of merchantability or fitness for a particular use.

ECRI assumes no liability or responsibility for how members use the information, comments, or opinions contained in Position Papers. All material in this Position Paper is protected by copyright, and all rights are reserved under international and Pan-American copyright conventions. Subscribers may not copy, resell, share, or reproduce information (except to print or email single report copies for authorized use within the member institution), or transfer it to third parties without prior written permission from ECRI.

About ECRI

ECRI is an independent, nonprofit organization improving the safety, quality, and cost-effectiveness of care across all healthcare settings. With a focus on patient safety, evidence-based medicine, and health technology decision solutions, ECRI is the trusted expert for healthcare leaders and agencies worldwide. The Institute for Safe Medication Practices (ISMP) is an ECRI affiliate. Visit ecri.org and follow @ECRI_Org.