

Demographic Characteristics of Persons Vaccinated During the First Month of the COVID-19 Vaccination Program — United States, December 14, 2020–January 14, 2021 (MMWR)

Bottom Line: From 12/14/20 to 1/14/21, about 13,000,000 people in the U.S. received at least 1 dose of the Pfizer-BioNTech or Moderna COVID-19 vaccine, representing about 4% of the total US population; a majority were women, 50 or older, and non-Hispanic White.

Details: This report analyzed demographic characteristics of US persons who received at least 1 dose of the Pfizer-BioNTech or Moderna COVID-19 vaccine during 12/14/20 – 1/14/21. 12,928,749 individuals in 64 US jurisdictions (50 states, DC, 5 cities, and 8 territories or freely associated states) and 5 federal entities (e.g., Federal Bureau of Prisons, Veterans Health Administration) received vaccine during the time period. Demographic data completeness varied, with data on sex, age, and race/ethnicity reported for 97%, 99.9%, and 51.9% of recipients, respectively. Among those who received an initial vaccine dose and for which demographic data were available: 63% were women and 55% were aged 50 or older, 16.8% were 40-49, and 28.2% were 18-39. 60.4% were non-Hispanic White; 14.4% identified as multiple/other race/ethnicity, 11.5% as Hispanic/Latino, 6% as Asian, 5.4% as Black, 2% as American Indian/Alaska Native, and 0.3% as Native Hawaiian/Pacific Islander. Percent of race/ethnicity data missingness ranged from 0.2%-100% across included jurisdictions and federal entities. More complete reporting of race/ethnicity data are needed to characterize and respond to inequities in COVID-19 vaccination, and ensure that those at highest risk for infection and severe outcomes, who are often Black, Latino, and American Indian/Alaska Native, are served equitably.

Key Takeaways:

- A majority of initial Pfizer-BioNTech and Moderna COVID-19 vaccine doses among women and those 50 and older likely reflects the respective demographic characteristics of people recommended to be vaccinated in the Phase 1a priority group.
- Data on race/ethnicity are difficult to interpret due to the high proportion of vaccine records with unknown or missing race/ethnicity; however, these data suggest that the percentage of individuals identifying as Black who were vaccinated during this time period was lower, relative to the percentage of Black health care personnel and long-term care facility residents - two key 1a priority groups.
- Findings affirm the need for more complete and standardized collection of race/ethnicity data among vaccine recipients in order to characterize and respond to inequities in COVID-19 vaccination. Similarly, as more groups become eligible for vaccine, monitoring coverage using a tool such as the Social Vulnerability Index should be used to identify communities for which focused immunization efforts may be needed.

COVID-19 Evidence Digest 2/3/21

The Impact of Vaccination on COVID-19 Outbreaks in the United States (CID)

Bottom Line: In this modeling study looking at the impact of a 2-dose vaccine rollout on SARS-CoV-2 transmission in the US, vaccination was projected to reduce the overall attack rate from 9% to 4.6% over 300 days, with the highest reduction seen in 65 and older adults.

Details: This agent-based modeling study of SARS-CoV-2 transmission sought to estimate the impact of 2-dose COVID-19 vaccines on infection attack rates and adverse outcomes due to COVID-19 in the US, including hospitalizations and deaths. In the model, a vaccine efficacy of 95% following 2 doses administered 21 days apart for 40% overall population coverage within 284 days was implemented, with the following groups prioritized sequentially: healthcare workers (assuming 70% coverage), adults with comorbidities (assuming 56% coverage), those age 65 and older (assuming 70% coverage), and all other 18-64 year olds (assuming 48% coverage). Varied levels of vaccine efficacy, vaccine coverage, and level of pre-existing immunity were tested during sensitivity analyses. The model accounted for current non-pharmaceutical interventions in place for a baseline effective reproduction number of 1.2 pre-vaccine roll out. Even with a 10-50% vaccine efficacy reduction in elderly and co-morbid individuals, vaccination reduced the overall attack rate from 9% to 4.6% over a 300-day period, with the highest reductions seen in 65 and older adults (by 54-62%). The impact of vaccination was reduced at higher levels of pre-existing immunity. Adverse outcomes were also significantly reduced in the model over a 300-day period, with a 63.5%, 65.6%, and 69.3% reduction in non-ICU hospitalizations, ICU hospitalizations, and deaths, respectively; likewise, reductions were lower with higher pre-existing immunity.

Key Takeaways:

- Findings suggest that vaccination with 95% efficacy against SARS-CoV-2 could bring about significantly lower attack rates, hospitalizations, and deaths, even if only adults are vaccinated, though coverage rates built into the model for priority populations may require strategic public health campaigns and transparent communication to be achievable.
- Continued adherence to non-pharmaceutical interventions (NPIs) is key to achieving the impacts estimated in the study; should NPIs be relaxed, a much higher coverage rate will be needed with significantly higher distribution capacity.

Resurgence of COVID-19 in Manaus, Brazil, Despite High Seroprevalence (Lancet)

Bottom Line: A previous article of blood donors in Manaus, Brasil indicated that 76% of the population had been infected with SARS-CoV-2 by October 2020, approaching theoretical herd immunity. An unexpected and significant increase in COVID-19 hospital admissions in the region in January 2021 points to several possible explanations, including: an overestimate of the attack rate from wave 1, waning immunity, evasion of immunity from previous infections by recently circulating SARS-CoV-2 variants, and higher transmissibility of recently circulating variants relative to wave 1.

Details: A recent study of blood donors in Manaus, Brasil, estimated that 76% of the population had been infected with SARS-CoV-2 by October 2020, which approaches herd

COVID-19 Evidence Digest 2/3/21

immunity. However, January 2021 saw significant upticks in COVID-19 hospital admissions in Manaus. Given presumed protection conferred by prior infection and low and stable hospitalizations in the region from May to November in the context of relaxed COVID-19 mitigation measures, the resurgence and increase in hospitalizations was unexpected. Several explanations are posited: 1) the wave 1 SARS-CoV-2 attack rate was overestimated or biased upwards to account for antibody waning, leaving more of the population unexposed than previously thought, though even at a lower seroprevalence threshold population immunity sufficient to avoid a larger outbreak should have been conferred; 2) immunoglobulin G (IgG) antibodies against SARS-CoV-2 may have started to wane by December 2020, although immunity is also dependent on B- and T-cell responses and recent studies suggest that reinfection up to 6 months post-initial infection is unlikely, so waning immunity is likely not a sufficient explanation on its own; 3) recently detected SARS-CoV-2 variants (B.1.1.7, B.1.3.51, P.1, and the newly classified P.2 variant) that have been found in Brasil may evade immunity generated from previous SARS-CoV-2 infection; and 4) variants circulating in the second wave may be more transmissible than those circulating in wave 1; the P.1 variant, in particular, has several mutations in common with B.1.1.7 and B.1.325, which were first identified in the UK and South Africa, respectively, both of which seem to be more easily spread. More data are rapidly needed to characterize the genetic, immunological, clinical, and epidemiological features of these variants and determine the extent to which explanations 3 and 4 are driving what is being observed in Manaus; likewise, more research is needed to understand whether the resurgence in Manaus is being driven by waning immunity, with implications both for the region and elsewhere around the world. Other high priorities include ongoing serological and genomic surveillance, monitoring of SARS-CoV-2 reinfections and non-pharmaceutical interventions, and assessing existing COVID-19 vaccine efficacy against SARS-CoV-2 variants that may potentially evade immunity from prior infection or vaccination.

Key Takeaways:

- More data are rapidly needed to characterize the genetic, immunological, clinical, and epidemiological features of SARS-CoV-2 variants circulating in Manaus and determine what may be driving the resurgence there, with implications for other locations.
- Other high priorities include ongoing serological and genomic surveillance, monitoring of SARS-CoV-2 reinfections and non-pharmaceutical interventions, and assessing existing COVID-19 vaccine efficacy against SARS-CoV-2 variants that may potentially evade immunity from prior infection or vaccination.

Assessment of Maternal and Neonatal Cord Blood SARS-CoV-2 Antibodies and Placental Transfer Ratios (JAMA Pediatrics)

Bottom Line: In this study, immunoglobulin G (IgG) antibodies against SARS-CoV-2 transferred across the placenta in 87% of pregnant people with current/prior COVID-19, and IgG concentrations in cord blood (blood left in the umbilical cord and placenta after birth) and were directly associated with those in the pregnant person, suggesting that newborns of seropositive mothers may have some protection against SARS-CoV-2 at birth.

COVID-19 Evidence Digest 2/3/21

Details: This cohort study sought to understand potential protection conferred by antibodies to neonates born to mothers with prior/current SARS-CoV-2 infection. A single hospital site in Philadelphia, PA enrolled 1471 mothers/newborns between 4/9/20 and 8/8/20; measurement of immunoglobulin G (IgG) and immunoglobulin M (IgM) antibodies against SARS-CoV-2 was taken from maternal and cord blood. Concentrations of antibodies and rates of transfer across the placenta were analyzed. IgG and/or IgM antibodies against SARS-CoV-2 were detected in 83 of 1471 mother/newborn dyads at time of delivery; IgG was detected in cord blood in 87% of these newborns (n=72). IgM antibodies were not detected in any cord blood samples, and no antibodies were detected in infants born to a mother without current/prior SARS-CoV-2 infection. Of the 11 infants born to seropositive mothers who had negative cord blood, 5 were born to mothers with IgM antibodies only, and 6 were born to mothers with substantially lower IgG levels. The level of IgG found in cord blood was positively associated with levels detected in mothers. Increasing time between maternal infection to delivery was positively associated with antibody transfer ratios, whereas severity of maternal infection was not – transfer ratios >1.0 were seen in people with asymptomatic and mild to severe COVID-19.

Key Takeaways:

- Findings from this study suggest that maternal IgG antibodies against SARS-CoV-2 transferred across the placenta in the majority of cases, regardless of COVID-19 disease severity. The level of IgG found in cord blood was positively associated with levels detected in mothers, and increasing time between maternal infection to delivery was positively associated with antibody transfer ratios; a recent [conference presentation](#) found substantially lower transfer levels of neutralizing antibodies, indicating more research is needed in this area.