New Research
*note, PREPRINTS have not undergone formal peer review

COVID-19 related publications by Providence caregivers – see Digital Commons

Epidemiology & Public Health


   We found a significantly lower risk of hospitalisation with omicron infection compared with delta infection among both vaccinated and unvaccinated individuals, suggesting an inherent reduced severity of omicron. Our results could guide modelling of the effect of the ongoing global omicron wave and thus health-care system preparedness.

2. **Seroprevalence of Infection-Induced SARS-CoV-2 Antibodies — United States, September 2021–February 2022.** Clarke KE, et al. *MMWR Morb Mortal Wkly Rep* 2022;71. DOI: [http://dx.doi.org/10.15585/mmwr.mm7117e3](http://dx.doi.org/10.15585/mmwr.mm7117e3)

   In December 2021, the B.1.1.529 (Omicron) variant of SARS-CoV-2, the virus that causes COVID-19, became predominant in the United States. Subsequently, national COVID-19 case rates peaked at their highest recorded levels. Traditional methods of disease surveillance do not capture all COVID-19 cases because some are asymptomatic, not diagnosed, or not reported; therefore, the proportion of the population with SARS-CoV-2 antibodies (i.e., seroprevalence) can improve understanding of population-level incidence of COVID-19. This report uses data from CDC’s national commercial laboratory seroprevalence study and the 2018 American Community Survey to examine U.S. trends in infection-induced SARS-CoV-2 seroprevalence during September 2021–February 2022, by age group.


   STEMI in hospitalized patients with COVID-19 is rare but associated with poor in-hospital outcomes. Rates of coronary angiography and primary reperfusion were low in this population of patients with STEMI and COVID-19. Adaptations of systems of care to ensure timely contemporary treatment for this population are needed.
Prognosis


We independently validated 4C Score as predicting risk of 30-day mortality in hospitalised SARS-CoV-2+ patients. We recommend dropping the CRP component of the score and using our recalibrated mortality risk estimates.

Survivorship & Rehabilitation


The sequelae of a hospital admission with COVID-19 were substantial 1 year after discharge across a range of health domains, with the minority in our cohort feeling fully recovered. Patient-perceived health-related quality of life was reduced at 1 year compared with before hospital admission. Systematic inflammation and obesity are potential treatable traits that warrant further investigation in clinical trials.

Therapeutics


Sotrovimab is a neutralizing monoclonal antibody targeting the conserved epitope on the spike protein receptor of SARS-CoV-2. It was granted emergency use authorization by the United States Food and Drug Administration in May 2021 with several countries closely following suit. Given as a single 500 mg IV infusion, sotrovimab inhibits the fusion of viral and cell membranes to decrease viral internalization. In addition, it was reported that the Omicron spike was resistant against most therapeutic antibodies but remained susceptible to inhibition by sotrovimab. However, on March 25, 2022, the FDA revised the authorization for sotrovimab to limit its use for the treatment of COVID-19 in certain U.S. regions with high frequency of the omicron BA.2 subvariant. Currently, there were a few studies that evaluated the effect of sotrovimab on clinical outcomes in patients with mildto-moderate COVID-19. Thus, we aim to perform a meta-analysis to evaluate the effect of sotrovimab in patients with COVID-19.


In patients infected with COVID-19 not requiring supplemental oxygen, systemic corticosteroids are associated with a small increase in mortality and progression to severe disease.

In this modeling study of a simulated US population, a mAb PEP for COVID-19 program was estimated to improve health outcomes and reduce costs. In the setting of a susceptible variant of SARS-CoV-2, health system and public health actors would have an opportunity to improve health and reduce net payer costs through COVID-19 PEP with mAbs.

**Vaccines / Immunology**


With the COVID-19 pandemic ongoing, accurate assessment of population immunity and the effectiveness of booster and enhancer vaccine doses is critical. We compare COVID-19-related hospitalization incidence rates in 2,412,755 individuals across four exposure levels: non-recent vaccine immunity (two BNT162b2 COVID-19 vaccine doses five or more months prior), boosted vaccine immunity (three BNT162b2 doses), infection-induced immunity (previous COVID-19 without a subsequent BNT162b2 dose), and enhanced infection-induced immunity (previous COVID-19 with a subsequent BNT162b2 dose). Rates, adjusted for potential demographic, clinical and health-seeking-behavior confounders, were assessed from July-November 2021 when the Delta variant was predominant. Compared with non-recent vaccine immunity, COVID-19-related hospitalization incidence rates were reduced by 89% (87-91%) for boosted vaccine immunity, 66% (50-77%) for infection-induced immunity and 75% (61-83%) for enhanced infection-induced immunity. We demonstrate that infection-induced immunity (enhanced or not) provides more protection against COVID-19-related hospitalization than non-recent vaccine immunity, but less protection than booster vaccination. Additionally, our results suggest that vaccinating individuals with infection-induced immunity further enhances their protection.


Three doses of BNT162b2 conferred high protection against hospital and emergency department admission due to both the delta and omicron variants in the first 3 months after vaccination. However, 3 months after receipt of a third dose, waning was apparent against SARS-CoV-2 outcomes due to the omicron variant, including hospital admission. Additional doses of current, adapted, or novel COVID-19 vaccines might be needed to maintain high levels of protection against subsequent waves of SARS-CoV-2 caused by the omicron variant or future variants with similar escape potential.

These early national data suggest that omicron is associated with a two-thirds reduction in the risk of COVID-19 hospitalisation compared with delta. Although offering the greatest protection against delta, the booster dose of vaccination offers substantial additional protection against the risk of symptomatic COVID-19 for omicron compared with 25 weeks or more after the second vaccine dose.


This retrospective cohort study included all members of Clalit Health Services, aged 60 to 100 years, who were eligible for the second-booster on January 3, 2022. Hospitalizations and mortality due to COVID-19 among participants who received the second-booster were compared with participants who received one booster dose. Cox proportional-hazards regression models with time-dependent covariates were used to estimate the association between the second-booster and hospitalizations and death due to COVID-19 while adjusting for demographic factors and coexisting illnesses. A total of 563,465 participants met the eligibility criteria. Of those, 328,597 (58%) received a second-booster dose during the 40-day study period. Hospitalizations due to COVID-19 occurred in 270 of the second-booster recipients and in 550 participants who received one booster dose (adjusted hazard ratio 0.36; 95% confidence interval (CI): 0.31 to 0.43). Death due to COVID-19 occurred in 92 second-booster recipients and in 232 participants who received one booster dose (adjusted hazard ratio 0.22; 95% CI 0.17 to 0.28). This study demonstrates a substantial reduction in hospitalizations and deaths due to Covid-19 conferred by a second-booster in Israeli adults aged 60 years and over.


Appendicitis has been reported as a potential adverse event after immunization with mRNA-based COVID-19 vaccines, based on trial data, adverse event report data, and observational data. We evaluated the risk of appendicitis after receiving an mRNA COVID-19 vaccination and after diagnosis of SARS-CoV-2 infection compared with the risk of appendicitis in unvaccinated individuals.


The unadjusted incidence rate per 100 000 person-years in the 1 to 21 days after mRNA vaccines was 1.3 and the adjusted RR in the 1 to 21 vs 22 to 42 days following mRNA vaccines was 0.56. In this cohort study of COVID-19 vaccines, the incidence of GBS was elevated after receiving the Ad.26.COV2.S vaccine. Surveillance is ongoing.

COVID-19 vaccine-associated axillary lymphadenopathy frequently persisted over 6 weeks on US. Lymphadenopathy should be interpreted considering vaccine type and time elapsed since vaccination. Follow-up US examination at least 12 weeks after vaccination may be reasonable, particularly for recipients of the mRNA vaccine.


Administering a COVID-19 vaccine not designed for the Omicron variant, >6 months after prior infection or vaccination, protects against Omicron variant infection in those previously infected or vaccinated. There is no evidence of an advantage to administering more than 1 dose of vaccine to previously infected persons.


BNT162b2 and mRNA-1273 were effective against COVID-19 following emergence of Omicron variant. A third dose provided additional protection over the primary series.

**Women & Children**


Compared with classic myocarditis, those with MIS-C myocarditis had better clinical outcomes, including rapid recovery of cardiac function. Patients with vaccine-related myocarditis had prompt resolution of symptoms and improvement of cardiac function.

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**GUIDELINES & CONSENSUS STATEMENTS**


**FDA / CDC / NIH / WHO Updates**

NIH Covid-19 Treatment Guidelines, several updates released April 29, 2022.

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