Providence

COVID-19 Resource Desk

#84 11.28.21 | 12.4.21

Prepared by System Library Services Retraction Watch

New Research

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

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

Clinical Syndrome

1. **Fungal infections in mechanically ventilated patients with COVID-19 during the first wave: the French multicentre MYCOVID study.** Gangneux JP et al. *Lancet Respir Med.* 2021 Nov 26:S2213-2600(21)00442-2. doi: 10.1016/S2213-2600(21)00442-2. https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(21)00442-2/fulltext
This study shows the high prevalence of invasive pulmonary aspergillosis and candidaemia and high mortality associated with pr/pb CAPA in mechanically ventilated patients with COVID-19. These findings highlight the need for active surveillance of fungal pathogens in patients with severe COVID-19.

2. **Sex-, Race- and Ethnicity-Based Differences in Thromboembolic Events Among Adults Hospitalized With COVID-19.** Ilyas S et al. *J Am Heart Assoc.* 2021 Nov 30:e022829. doi: 10.1161/JAHA.121.022829. https://www.ahajournals.org/doi/10.1161/JAHA.121.022829
Men and non-Hispanic Black adults hospitalized with COVID-19 are more likely to have venous and arterial thromboembolic events. These subgroups may represent at-risk patients more susceptible to thromboembolic COVID-19 complications.

Epidemiology & Public Health

3. **Increased risk of SARS-CoV-2 reinfection associated with emergence of the Omicron variant in South Africa.** Pulliam JRC, et al. *medRxiv* 2021.11.11.21266068; doi: https://doi.org/10.1101/2021.11.11.21266068 **Preprint**
Results: 35,670 suspected reinfections were identified among 2,796,982 individuals with laboratory-confirmed SARS-CoV-2 who had a positive test result at least 90 days prior to 27 November 2021. The number of reinfections observed through the end of the third wave was consistent with the null model of no change in reinfection risk (approach 1). Although increases in the hazard of primary infection were observed following the introduction of both the Beta and Delta variants, no corresponding increase was observed in the reinfection hazard (approach 2). Contrary to expectation, the estimated hazard ratio for reinfection versus primary infection was lower during waves driven by the Beta and Delta variants than for the first wave (relative hazard ratio for wave 2 versus wave 1: 0.75 (CI95: 0.59-0.97); for wave 3 versus wave 1:0.71

(CI95: 0.56-0.92)). In contrast, the recent spread of the Omicron variant has been associated with a decrease in the hazard of primary infection and an increase in reinfection hazard. The estimated hazard ratio for reinfection versus primary infection for the period from 1 November 2021 to 27 November 2021 versus wave 1 was 2.39 (CI95: 1.88-3.11). Conclusion: Population-level evidence suggests that the Omicron variant is associated with substantial ability to evade immunity from prior infection. In contrast, there is no population-wide epidemiological evidence of immune escape associated with the Beta or Delta variants. This finding has important implications for public health planning, particularly in countries like South Africa with high rates of immunity from prior infection. Urgent questions remain regarding whether Omicron is also able to evade vaccine-induced immunity and the potential implications of reduced immunity to infection on protection against severe disease and death.

4. **US State-Level Legal Interventions Related to COVID-19 Vaccine Mandates.** Fernandes B, et al. *JAMA.* 2021 Dec 2. doi: 10.1001/jama.2021.22122.
https://jamanetwork.com/journals/jama/fullarticle/2786984
Mandates can increase vaccine uptake, but their effectiveness is associated with who is covered, penalties, and exemptions. The US federal government recently required federal employees to be vaccinated against SARS-CoV-2 and developed standards for large employers. However, individual states traditionally take the lead in regulating public health via vaccine mandates. Some states have attempted to introduce requirements to increase uptake of COVID-19 vaccines. However, others have attempted to impede COVID-19 vaccine mandates. Most efforts have been considered by legislatures; also, some governors and regulatory agencies have issued executive orders. We assessed state-level legal interventions to promote or impede COVID-19 vaccine mandates since the beginning of the pandemic.

Prognosis

5. **Predictors and microbiology of respiratory and bloodstream bacterial infection in patients with COVID-19: living rapid review update and meta-regression.** Langford BJ et al. *Clin Microbiol Infect.* 2021 Nov 26:S1198-743X(21)00636-4. doi: 10.1016/j.cmi.2021.11.008.
https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(21)00636-4/fulltext
While the odds of respiratory and bloodstream bacterial infection are low in patients with COVID-19, meta-regression revealed potential risk factors for infection, including ICU setting and mechanical ventilation. The risk for secondary infection is substantially greater than the risk for co-infection in patients with COVID-19. Understanding predictors of co-infection and secondary infection may help to support improved antibiotic stewardship in patients with COVID-19.

6. **Significant association of pre-existing asthma with an increased risk for ICU admission among COVID-19 patients: Evidence based on a meta-analysis.** Han X, et al. *J Infect.* 2021 Nov 29:S0163-4453(21)00582-X. doi: 10.1016/j.jinf.2021.11.021.
https://www.journalofinfection.com/article/S0163-4453(21)00582-X/fulltext

Highlights: COVID-19 patients with asthma had a significantly higher risk for ICU admission. Age affected the link of asthma with the risk of ICU admission in COVID-19. Sex ratio modulated the link of asthma with the risk of ICU admission in COVID-19.

Therapeutics

7. **Effect of High-Titer Convalescent Plasma on Progression to Severe Respiratory Failure or Death in Hospitalized Patients with COVID-19 Pneumonia: A Randomized Clinical Trial.** Menichetti F et al. *JAMA Netw Open.* 2021 Nov 1;4(11):e2136246. doi: 10.1001/jamanetworkopen.2021.36246. https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2786680
   In patients with moderate to severe COVID-19 pneumonia, high-titer anti-SARS-CoV-2 CP did not reduce the progression to severe respiratory failure or death within 30 days.

8. **Evaluation of the effect of sofosbuvir and daclatasvir in hospitalized COVID-19 patients: a randomized double-blind clinical trial (DISCOVER).** Mobarak S et al. *J Antimicrob Chemother*. 2021 Nov 28:dkab433. doi: 10.1093/jac/dkab433. https://academic.oup.com/jac/advance-article/doi/10.1093/jac/dkab433/6445131
   We observed no significant effect of sofosbuvir/daclatasvir versus placebo on hospital discharge or survival in hospitalized COVID-19 patients.

9. **Efficacy of Early Treatment with Favipiravir on Disease Progression among High Risk COVID-19 Patients: A Randomized, Open-Label Clinical Trial.** Chuah CH et al. *Clin Infect Dis.* 2021 Nov 19:ciab962. doi: 10.1093/cid/ciab962. https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab962/6432025
   Among COVID-19 patients at high risk of disease progression, early treatment with oral favipiravir did not prevent their disease progression from non-hypoxia to hypoxia.

Transmission / Infection Control

10. **Prevention of SARS-CoV-2 transmission during a large, live, indoor gathering (SPRING): a non-inferiority, randomised, controlled trial.** Delaugerre C et al. *Lancet Infect Dis*. 2021 Nov 26:S1473-3099(21)00673-3. doi: 10.1016/S1473-3099(21)00673-3. https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00673-3/fulltext
    Participation in a large, indoor, live gathering without physical distancing was not associated with increased SARS-CoV-2-transmission risk, provided a comprehensive preventive intervention was implemented.

11. **Surface and air contamination with SARS-CoV-2 from hospitalized COVID-19 patients in Toronto, Canada, March-May 2020.** Kotwa JD et al. *J Infect Dis.* 2021 Nov 27:jiab578. doi: 10.1093/infdis/jiab578. https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiab578/6444802
    RESULTS: SARS-CoV-2 RNA was detected from surfaces (125/474 samples; 42/78 patients) and air (3/146 samples; 3/45 patients); 17% (6/36) of surface samples from three patients yielded

viable virus. Viral sequences from nasopharyngeal and surface samples clustered by patient. Multivariable analysis indicated hypoxia at admission, PCR-positive nasopharyngeal swab (cycle threshold of ≤30) on or after surface sampling date, higher Charlson co-morbidity score, and shorter time from onset of illness to sampling date were significantly associated with detection of SARS-CoV-2 RNA in surface samples. The infrequent recovery of infectious SARS-CoV-2 virus from the environment suggests that the risk to healthcare workers from air and near-patient surfaces in acute care hospital wards is likely limited.

12. **Impact of community masking on COVID-19: A cluster-randomized trial in Bangladesh.** Abaluck J et al. *Science* 2021 Dec 2. DOI: 10.1126/science.abi9069 https://www.science.org/doi/10.1126/science.abi9069
We conducted a cluster-randomized trial to measure the effect of community-level mask distribution and promotion on symptomatic SARS-CoV-2 infections in rural Bangladesh from November 2020 to April 2021 (N = 600 villages, N = 342,183 adults). We cross-randomized mask type (cloth vs. surgical) and promotion strategies at the village and household level. Proper mask-wearing increased from 13.3% in the control group to 42.3% in the intervention arm (adjusted percentage point difference = 0.29 [0.26, 0.31]). The intervention reduced symptomatic seroprevalence (adjusted prevalence ratio = 0.91 [0.82, 1.00]), especially among adults 60+ years in villages where surgical masks were distributed (adjusted prevalence ratio = 0.65 [0.45, 0.85]). Mask distribution and promotion was a scalable and effective method to reduce symptomatic SARS-CoV-2 infections.

Vaccines / Immunology

13. **Nationwide effectiveness of five SARS-CoV-2 vaccines in Hungary - The HUN-VE study.** Vokó Z et al. *Clin Microbiol Infect.* 2021 Nov 24:S1198-743X(21)00639-X. doi: 10.1016/j.cmi.2021.11.011. https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(21)00639-X/fulltext
RESULTS: Between 22 January 2021 and 10 June 2021, 3,740,066 Hungarian individuals received two doses of the BNT162b2 (Pfizer-BioNTech), HB02 (Sinopharm), Gam-COVID-Vac (Sputnik-V), AZD1222 (AstraZeneca), or mRNA-1273 (Moderna) vaccines. Incidence rates of SARS-CoV2 infection and Covid-19 related death were 1.73-9.3/100,000 person-days and 0.04-0.65/100.000 person-days in the fully vaccinated population, respectively. Estimated adjusted effectiveness varied between 68.7% (95% CI 67.2-70.1%) and 88.7% (95% CI: 86.6-90.4%) against SARS-CoV-2 infection, and between 87.8% (95% CI: 86.1-89.5%) and 97.5% (95% CI: 95.6-98.6%) against Covid-19 related death, with 100% effectiveness in individuals aged 16-44 years for all vaccines. Our observational study demonstrated the high or very high effectiveness of five different vaccines in the prevention SARS-CoV-2 infection and Covid-19 related death.

14. **Immunogenicity trends one and three months after second BNT162B2 vaccination among healthcare workers in Israel.** Shachor-Meyouhas Y et al. *Clin Microbiol Infect.* 2021 Nov 24:S1198-743X(21)00660-1. doi: 10.1016/j.cmi.2021.11.014. https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(21)00660-1/fulltext

Most HCWs had measurable antibodies at 3 months. Risk factors for lower antibody levels were older age, male sex, underlying condition, and immunosuppressive treatment. These factors may be considered when planning booster doses during vaccine shortage.

15. **Effectiveness of ChAdOx1 nCoV-19 vaccine against SARS-CoV-2 infection during the delta (B.1.617.2) variant surge in India: a test-negative, case-control study and a mechanistic study of post-vaccination immune responses.** Thiruvengadam R et al. *Lancet Infect Dis.* 2021 Nov 25:S1473-3099(21)00680-0. doi: 10.1016/S1473-3099(21)00680-0. https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00680-0/fulltext
The ChAdOx1 nCoV-19 vaccine remained effective against moderate-to-severe COVID-19, even during a surge that was dominated by the highly transmissible delta variant of SARS-CoV-2. Spike-specific T-cell responses were maintained against the delta variant. Such cellular immune protection might compensate for waning humoral immunity.

16. **Hybrid immunity versus vaccine-induced immunity against SARS-CoV-2 in patients with autoimmune rheumatic diseases.** Shenoy P et al. *Lancet Rheumatol.* 2021 Nov 22. doi: 10.1016/S2665-9913(21)00356-8. https://www.thelancet.com/journals/lanrhe/article/PIIS2665-9913(21)00356-8/fulltext
There have been reports that a single dose of mRNA vaccine in people with a history of SARS-CoV-2 infection induces an immune response similar to those who have received two doses of vaccine and no history of such infection. Similar data have been put forward for the vector-borne vaccine ChAdOx1. We are not aware of such reports in patients with AIRD. We tested whether this hypothesis held true for AIRD patients on immunosuppressants.

17. **Odds of Testing Positive for SARS-CoV-2 Following Receipt of 3 vs 2 Doses of the BNT162b2 mRNA Vaccine.** Patalon T, et al. *JAMA Intern Med.* 2021 Nov 30. doi: 10.1001/jamainternmed.2021.7382. https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2786890
Previous studies have demonstrated that vaccine-derived protection against SARS-CoV-2 wanes over time. In this case-control analysis, we showed an association between receipt of the booster dose and a reduction in the odds of testing positive for SARS-CoV-2, potentially counteracting waning immunity in the short term. Further monitoring of data from this population is needed to determine the duration of immunity following the booster.

18. **Early Immunogenicity and safety of the third dose of BNT162b2 mRNA Covid-19 vaccine among adults older than 60 years; real world experience.** Gilboa M et al. *J Infect Dis.* 2021 Nov 29:jiab584. doi: 10.1093/infdis/jiab584. https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiab584/6446235
RESULTS: A pronounced immune response was observed following the third dose, including a 33-fold and 51-fold increase in IgG and neutralizing ab, respectively. The neutralizing antibody levels post-third-dose were 9.34 times higher than post-second-dose (GMT 2598 95%CI 2085-3237 vs. 207 95%CI 126-339). Nine previously low-responders, had a significant antibody increase post-third-dose, and 7/9 showed increase in T cell activation. Additionally, sera obtained post-third-dose, highly and comparably neutralized the wild-type, delta and lambda

variants. Of 1056 responders to the adverse-event survey, none had serious events. We demonstrate a rapid and broad immune response to the third BNT162b2 dose in individuals>60 years.

19. **Immune responses to the ChAdOx1 nCoV-19 and BNT162b2 vaccines and to natural COVID-19 infections over a three-month period.** Kim JY et al. *J Infect Dis.* 2021 Nov 25:jiab579. doi: 10.1093/infdis/jiab579. https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiab579/6440288
Antibody responses after the 2 nd dose of BNT162b2 are higher than after the 2 nd dose of ChAdOx1 and like those occurring after natural infection. T cell responses are maintained longer in BNT162b2 vaccinees than in ChAdOx1 vaccinees.

20. **Multisystem Inflammatory Syndrome in Adults after SARS-CoV-2 infection and COVID-19 vaccination.** Belay ED et al. *Clin Infect Dis.* 2021 Nov 28:ciab936. doi: 10.1093/cid/ciab936. https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab936/6445178
RESULTS: From December 14, 2020 to April 30, 2021, 20 patients who met the case definition for MIS-A were reported to CDC. Their median age was 35 years (range, 21-66 years), and 13 (65%) were male. Overall, 16 (80%) patients had a preceding COVID-19-like illness a median of 26 days (range 11-78 days) before MIS-A onset. All 20 patients had laboratory evidence of SARS-CoV-2 infection. Seven MIS-A patients (35%) received COVID-19 vaccine a median of 10 days (range, 6-45 days) before MIS-A onset; 3 patients received a second dose of COVID-19 vaccine 4, 17, and 22 days before MIS-A onset. Patients with MIS-A predominantly had gastrointestinal and cardiac manifestations and hypotension or shock. Although 7 patients were reported to have received COVID-19 vaccine, all had evidence of prior SARS-CoV-2 infection. Given the widespread use of COVID-19 vaccines, the lack of reporting of MIS-A associated with vaccination alone, without evidence of underlying SARS-CoV-2 infection, is reassuring.

21. **Epidemiology of Acute Myocarditis/Pericarditis in Hong Kong Adolescents Following Comirnaty Vaccination.** Chua GT et al. *Clin Infect Dis.* 2021 Nov 28:ciab989. doi: 10.1093/cid/ciab989. https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab989/6445179
RESULTS: Between 14 June 2021 and 4 September 2021, 33 Chinese adolescents who developed acute myocarditis/pericarditis following Comirnaty vaccination were identified. 29 (87.88%) were males and 4 (12.12%) were females, with a median age of 15.25 years. 27 (81.82%) and 6 (18.18%) cases developed acute myocarditis/pericarditis after receiving the second and first dose, respectively. All cases are mild and required only conservative management. The overall incidence of acute myocarditis/pericarditis was 18.52 (95% Confidence Interval [CI], 11.67-29.01) per 100,000 persons vaccinated. The incidence after the first and second doses were 3.37 (95%CI 1.12-9.51) and 21.22 (95%CI 13.78-32.28 per 100,000 persons vaccinated, respectively. Among male adolescents, the incidence after the first and second doses were 5.57 (95% CI 2.38-12.53) and 37.32 (95% CI 26.98-51.25) per 100,000 persons vaccinated. There is a significant increase in the risk of acute myocarditis/pericarditis following Comirnaty vaccination among Chinese male adolescents, especially after the second dose.

22. **A Higher Antibody Response Is Generated With a 6- to 7-Week (vs Standard) Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Vaccine Dosing Interval.** Grunau B et al. *Clin Infect Dis.* 2021 Nov 30:ciab938. doi: 10.1093/cid/ciab938.
https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab938/6446287
The optimal dosing interval for severe acute respiratory syndrome coronavirus 2 vaccines remains controversial. In this prospective study, we compared serology results of paramedics vaccinated with mRNA vaccines at the recommended short (17-28 days) vs long (42-49 days) interval. We found that a long dosing interval resulted in higher spike, receptor binding domain, and spike N terminal domain antibody concentrations.

23. **Association of COVID-19 Vaccination with SARS-CoV-2 Infection in Patients with Cancer: A US Nationwide Veterans Affairs Study.** Wu JT et al. *JAMA Oncol.* 2021 Dec 2. doi: 10.1001/jamaoncol.2021.5771.
https://jamanetwork.com/journals/jamaoncology/fullarticle/2786477
In this cohort study, COVID-19 vaccination was associated with lower SARS-CoV-2 infection rates in patients with cancer. Some immunosuppressed subgroups may remain at early risk for COVID-19 despite vaccination, and consideration should be given to additional risk reduction strategies, such as serologic testing for vaccine response and a third vaccine dose to optimize outcomes.

FDA / CDC / NIH / WHO Updates

CDC - Science Brief: Omicron (B.1.1.529) Variant

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