

## COVID-19 Resource Desk

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### New Research

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

**COVID-19 related publications by Providence caregivers – see [Digital Commons](#)**

### Diagnostics & Screening

1. **Accuracy of 2 Rapid Antigen Tests During 3 Phases of SARS-CoV-2 Variants.** Drain PK et al. *JAMA Netw Open.* 2022 Aug 1;5(8):e2228143. doi: 10.1001/jamanetworkopen.2022.28143. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2795599>

In this diagnostic study, analytical and clinical performance data demonstrated accuracy of 2 rapid antigen tests among adults with COVID-19 symptoms across 3 phases of SARS-CoV-2 variants. The findings suggest that home-based rapid antigen testing programs may be an important intervention to reduce global SARS-CoV-2 transmission.

### Epidemiology & Public Health

2. **Geographic, Occupational, and Sociodemographic Variations in Uptake of COVID-19 Booster Doses Among Fully Vaccinated US Adults, December 1, 2021, to January 10, 2022.** Agaku IT, Adeoye C, Long TG. *JAMA Netw Open.* 2022 Aug 1;5(8):e2227680. doi: 10.1001/jamanetworkopen.2022.27680. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2795410>

These findings suggest continuing disparities in receipt of booster vaccine doses among US adults. Targeted efforts at populations with low uptake may be needed to improve booster vaccine coverage in the US.

3. **Seasonality of Common Human Coronaviruses, United States, 2014-2021(1).** Shah MM, et al *Emerg Infect Dis.* 2022 Aug 25;28(10). doi: 10.3201/eid2810.220396. [https://wwwnc.cdc.gov/eid/article/28/10/22-0396\\_article](https://wwwnc.cdc.gov/eid/article/28/10/22-0396_article)

The 4 common types of human coronaviruses (HCoVs)-2 alpha (HCoV-NL63 and HCoV-229E) and 2 beta (HCoV-HKU1 and HCoV-OC43)-generally cause mild upper respiratory illness. Seasonal patterns and annual variation in predominant types of HCoVs are known, but parameters of expected seasonality have not been defined. We defined seasonality of HCoVs during July 2014-November 2021 in the United States by using a retrospective method applied to National Respiratory and Enteric Virus Surveillance System data. In the 6 HCoV seasons before 2020-21, season onsets occurred October 21-November 12, peaks January 6-February 13, and offsets April 18-June 27; most (>93%) HCoV detection was within the defined seasonal onsets and offsets. The 2020-21 HCoV season onset was 11 weeks

later than in prior seasons, probably associated with COVID-19 mitigation efforts. Better definitions of HCoV seasonality can be used for clinical preparedness and for determining expected patterns of emerging coronaviruses.

**4. Uncoupling of all-cause excess mortality from COVID-19 cases in a highly vaccinated state.**

Faust JS, et al. *Lancet Infect Dis*. 2022 Aug 22:S1473-3099(22)00547-3. doi: 10.1016/S1473-3099(22)00547-3. [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(22\)00547-3/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(22)00547-3/fulltext)

Since March, 2020, excess mortality—the number of all-cause deaths exceeding the baseline number of expected deaths—has been observed in waves coinciding with COVID-19 outbreaks in the USA and worldwide. However, after February, 2022, the reported number of COVID-19-associated deaths decreased despite a notable spring wave of infections primarily due to omicron subvariants (BA.2, BA.2.12.1, BA.4, BA.5). Until now, it has been unknown whether the spring, 2022, COVID-19 wave in Massachusetts, USA, was associated with all-cause excess mortality.

**5. Laboratory-Confirmed COVID-19-Associated Hospitalizations Among Adults During SARS-CoV-2 Omicron BA.2 Variant Predominance - COVID-19-Associated Hospitalization Surveillance Network, 14 States, June 20, 2021-May 31, 2022.**

Havers FP et al. *MMWR Morb Mortal Wkly Rep*. 2022 Aug 26;71(34):1085-1091. doi: 10.15585/mmwr.mm7134a3. [https://www.cdc.gov/mmwr/volumes/71/wr/mm7134a3.htm?s\\_cid=mm7134a3\\_w](https://www.cdc.gov/mmwr/volumes/71/wr/mm7134a3.htm?s_cid=mm7134a3_w)

Increased hospitalization rates among adults aged  $\geq 65$  years compared with rates among younger adults were most pronounced during the Omicron BA.2–predominant period. Among hospitalized nonpregnant patients, 44.1% had received primary vaccination and  $\geq 1$  booster or additional dose. Hospitalization rates among unvaccinated adults were approximately triple those of vaccinated adults.

### Healthcare Delivery & Healthcare Workers

**6. The Appropriateness of the Decision to Quarantine Healthcare Workers Exposed to a COVID-19 Positive Co-worker Based on National Guidelines.**

Mark E, et al. *Infect Control Hosp Epidemiol*. 2022 Aug 19:1-23. doi: 10.1017/ice.2022.198.

<https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/abs/appropriateness-of-the-decision-to-quarantine-healthcare-workers-exposed-to-a-covid19-positive-coworker-based-on-national-guidelines/8C2D9453A1C55EF26D0604B3A2CE98E3>

Efficient and tight system of HCW contact investigations served its purpose. The study was based on HCWs' reports and reported adherence to safety regulations and its findings are relevant to the massive waves of the Alpha variant of COVID-19 yet still they demonstrate an effective way of handling risk while not causing damage due to arbitrary risk control measures.

### Prognosis

**7. Are Ambulatory ACE Inhibitors/Angiotensin Receptor Blockers Associated with Reduced SARS-CoV-2 Infections and Improved Outcomes, and Does Race Matter?** Armato J, Chiu ST,

Rider D, Ruby R. [Providence authors]. *Diabetes Obes Metab*. 2022 Aug 16. doi: 10.1111/dom.14835. <https://doi.org/10.1111/dom.14835>

The results demonstrate: (i) an association between reduced risk of COVID-19 infection/complications and ACEi/ARB (documented by EHR) regardless of race; (ii) an increased risk of COVID-19 infection/complications in the African American population when compared to a propensity matched non-African American population; (iii) a reduction in the risk of COVID-19 infection in African Americans treated with ACEi/ARB that was similar to that in non-African Americans. If the beneficial effect of ACEi/ARB treatment on COVID-19 infection/outcomes is validated, this could have substantial impact on mitigating the clinical course of COVID -19 infection. The majority (>70%) of the present study population was not receiving ACEi/ARB. This retrospective study provides no method by which to identify a population to initiate ACEi/ARB treatment prospectively and says nothing about initiating ACEi/ARB treatment after COVID infection occurs. However, prospective studies based upon RAS markers may answer this question.

- 8. Update to living systematic review on prediction models for diagnosis and prognosis of covid-19.** *BMJ*. 2022 Aug 22;378:o2009. doi: 10.1136/bmj.o2009. <https://www.bmj.com/content/378/bmj.o2009>

The final version of this living systematic review is a comprehensive overview and critical appraisal of all models developed or validated during the first year of the pandemic. Following the ubiquity of polymerase chain reaction and antigen tests, the focus of the living review has been restricted to prognostic models. The update reports on 606 prognostic models and validations from 310 studies, of which 499 models and validations from 243 studies are newly included in the present update. Most models reported good to excellent ability to discriminate between high and low risk patients but were at high risk of bias due to methodological shortcomings.

### Survivorship & Rehabilitation

- 9. Neurological and psychiatric risk trajectories after SARS-CoV-2 infection: an analysis of 2-year retrospective cohort studies including 1 284 437 patients.** Taquet M, et al. *Lancet Psychiatry*. 2022 Aug 17:S2215-0366(22)00260-7. doi: 10.1016/S2215-0366(22)00260-7. [https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(22\)00260-7/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(22)00260-7/fulltext)

This analysis of 2-year retrospective cohort studies of individuals diagnosed with COVID-19 showed that the increased incidence of mood and anxiety disorders was transient, with no overall excess of these diagnoses compared with other respiratory infections. In contrast, the increased risk of psychotic disorder, cognitive deficit, dementia, and epilepsy or seizures persisted throughout. The differing trajectories suggest a different pathogenesis for these outcomes. Children have a more benign overall profile of psychiatric risk than do adults and older adults, but their sustained higher risk of some diagnoses is of concern. The fact that neurological and psychiatric outcomes were similar during the delta and omicron waves indicates that the burden on the health-care system might continue even with variants that are less severe in other respects. Our findings are relevant to understanding individual-level and population-level risks of neurological and psychiatric disorders after SARS-CoV-2 infection and can help inform our responses to them.

- 10. COVID-19 severity and risk of subsequent cardiovascular events.** Wiemken TL, et al. *Clin Infect Dis*. 2022 Aug 19:ciac661. doi: 10.1093/cid/ciac661. <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciac661/6671924>

COVID-19 patients hospitalized or requiring critical care had a significantly higher risk of experiencing and being hospitalized for post-COVID-19 CVE than patients with milder COVID-19 who were managed solely in the outpatient setting even after adjusting for differences between these groups. These findings underscore the continued importance of preventing SARS-CoV-2 infection from progressing to severe illness to reduce potential long-term cardiovascular complications.

## Therapeutics

- 11. Oral Nirmatrelvir and Ritonavir in Non-hospitalized Vaccinated Patients with Covid-19.** Ganatra S, et al. *Clin Infect Dis*. 2022 Aug 20:ciac673. doi: 10.1093/cid/ciac673. <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciac673/6672670>

Treatment with NMV-r in non-hospitalized vaccinated patients with Covid-19 was associated with a reduced likelihood of emergency room visits, hospitalization, or death. Complications and overall resource utilization were also decreased.

- 12. Nirmatrelvir Use and Severe Covid-19 Outcomes during the Omicron Surge.** Arbel R et al. *N Engl J Med*. 2022 Aug 24. doi: 10.1056/NEJMoa2204919. <https://www.nejm.org/doi/10.1056/NEJMoa2204919>

Among patients 65 years of age or older, the rates of hospitalization and death due to Covid-19 were significantly lower among those who received nirmatrelvir than among those who did not. No evidence of benefit was found in younger adults.

## Transmission / Infection Control

- 13. Onset and window of SARS-CoV-2 infectiousness and temporal correlation with symptom onset: a prospective, longitudinal, community cohort study.** Hakki S et al. *Lancet Respir Med*. 2022 Aug 18:S2213-2600(22)00226-0. doi: 10.1016/S2213-2600(22)00226-0. [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(22\)00226-0/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(22)00226-0/fulltext)

Less than a quarter of COVID-19 cases shed infectious virus before symptom onset; under a crude 5-day self-isolation period from symptom onset, two-thirds of cases released into the community would still be infectious, but with reduced infectious viral shedding. Our findings support a role for LFDs to safely accelerate deisolation but not for early diagnosis, unless used daily. These high-resolution, community-based data provide evidence to inform infection control guidance.

- 14. Incubation Period of COVID-19 Caused by Unique SARS-CoV-2 Strains: A Systematic Review and Meta-analysis.** Wu Y, Kang L, Guo Z, Liu J, Liu M, Liang W. *JAMA Netw Open*. 2022 Aug 1;5(8):e2228008. doi: 10.1001/jamanetworkopen.2022.28008. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2795489>

The findings of this study suggest that SARS-CoV-2 has evolved and mutated continuously throughout the COVID-19 pandemic, producing variants with different enhanced transmission and virulence.

Identifying the incubation period of different variants is a key factor in determining the isolation period.

## Vaccines / Immunology

**15. Risk for Myocardial Infarction, Stroke, and Pulmonary Embolism Following COVID-19 Vaccines in Adults Younger Than 75 Years in France.** Botton J, et al. *Ann Intern Med.* 2022 Aug 23. doi: 10.7326/M22-0988. <https://www.acpjournals.org/doi/10.7326/M22-0988>

In persons aged 18 to 74 years, adenoviral-based vaccines may be associated with increased incidence of MI and PE. No association between mRNA-based vaccines and the cardiovascular events studied was observed.

**16. COVID-19 Disease Severity in Persons Infected with Omicron BA.1 and BA.2 Sublineages and Association with Vaccination Status.** Butt AA, et al. *JAMA Intern Med.* 2022 Aug 22. doi: 10.1001/jamainternmed.2022.3351. <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2795326>

Infection with the SARS-CoV-2 Omicron variant is associated with less severe disease compared with the Delta variant. Two main Omicron sublineages—BA.1 and BA.2—have variable geographic distribution. In Qatar, BA.1 was initially predominant but was quickly replaced by BA.2 as the predominant sublineage. This study sought to determine and compare the severity of SARS-CoV-2 infection among persons infected with these sublineages.

**17. Risk of Myocarditis After Sequential Doses of COVID-19 Vaccine and SARS-CoV-2 Infection by Age and Sex.** Patone M et al. *Circulation.* 2022 Aug 22. doi: 10.1161/CIRCULATIONAHA.122.059970. <https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.122.059970>

Overall, the risk of myocarditis is greater after SARS-CoV-2 infection than after COVID-19 vaccination and remains modest after sequential doses including a booster dose of BNT162b2 mRNA vaccine. However, the risk of myocarditis after vaccination is higher in younger men, particularly after a second dose of the mRNA-1273 vaccine.

**18. Acute Arterial Ischemic Stroke Following COVID-19 Vaccination: A Systematic Review and Meta-analysis.** Stefanou MI et al. *Neurology.* 2022 Aug 24:10.1212/WNL.0000000000200996. doi: 10.1212/WNL.0000000000200996. <https://n.neurology.org/content/early/2022/08/24/WNL.0000000000200996>

The pooled proportion of AIS following COVID-19 vaccination is comparable to the prevalence of AIS in the general population and much lower than the AIS prevalence among SARS-CoV-2-infected patients. TTS is very uncommonly reported in patients with AIS following COVID-19 vaccination.

**19. Renin-Angiotensin System Inhibitors in Patients With COVID-19: A Meta-Analysis of Randomized Controlled Trials Led by the International Society of Hypertension.** Gnanenthiran SR et al. *J Am Heart Assoc.* 2022 Aug 24:e026143. doi: 10.1161/JAHA.122.026143. <https://www.ahajournals.org/doi/10.1161/JAHA.122.026143>

This meta-analysis of randomized controlled trials evaluating angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers versus control in patients with COVID-19 found no difference in all-cause mortality, a borderline decrease in myocardial infarction, and an increased risk of acute kidney injury with RASi. Our findings provide strong evidence that RASi can be used safely in patients with COVID-19.

**20. Antiviral and clinical activity of bamlanivimab in a randomized trial of non-hospitalized adults with COVID-19.** Chew KW et al. *Nat Commun.* 2022 Aug 22;13(1):4931. doi: 10.1038/s41467-022-32551-2. <https://www.nature.com/articles/s41467-022-32551-2>

Anti-SARS-CoV-2 monoclonal antibodies are mainstay COVID-19 therapeutics. Safety, antiviral, and clinical efficacy of bamlanivimab were evaluated in the randomized controlled trial ACTIV-2/A5401. Non-hospitalized adults were randomized 1:1 within 10 days of COVID-19 symptoms to bamlanivimab or blinded-placebo in two dose-cohorts (7000 mg, n = 94; 700 mg, n = 223). No differences in bamlanivimab vs placebo were observed in the primary outcomes: proportion with undetectable nasopharyngeal SARS-CoV-2 RNA at days 3, 7, 14, 21, and 28 (risk ratio = 0.82-1.05 for 7000 mg [p(overall) = 0.88] and 0.81-1.21 for 700 mg [p(overall) = 0.49]), time to symptom improvement (median 21 vs 18.5 days [p = 0.97], 7000 mg; 24 vs 20.5 days [p = 0.08], 700 mg), or grade 3+ adverse events. However, bamlanivimab was associated with lower day 3 nasopharyngeal viral levels and faster reductions in inflammatory markers and viral decay by modeling. This study provides evidence of faster reductions in nasopharyngeal SARS-CoV-2 RNA levels but not shorter symptom durations in non-hospitalized adults with early variants of SARS-CoV-2.

### Women & Children

**21. Clinical Features and Burden of Postacute Sequelae of SARS-CoV-2 Infection in Children and Adolescents.** Rao S et al. *JAMA Pediatr.* 2022 Aug 22. doi: 10.1001/jamapediatrics.2022.2800. <https://jamanetwork.com/journals/jamapediatrics/fullarticle/2795569>

In this large-scale, exploratory study, the burden of pediatric PASC that presented to health systems was low. Myocarditis was the most commonly diagnosed PASC-associated condition. Acute illness severity, young age, and comorbid complex chronic disease increased the risk of PASC.

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### FDA / CDC / NIH / WHO Updates

FDA - [Novavax COVID-19 Vaccine now authorized for 12-17-year-olds](#)

NIH – [Covid-19 Treatment Guidelines, Anti-SARS-CoV-2 Monoclonal Antibodies.](#)

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