



## 2019-nCoV Literature Situation Report (Lit Rep)

May 20, 2021

The scientific literature on COVID-19 is rapidly evolving and these articles were selected for review based on their relevance to Washington State decision making around COVID-19 response efforts. Included in these Lit Reps are some manuscripts that have been made available online as pre-prints but have not yet undergone peer review. Please be aware of this when reviewing articles included in the Lit Reps.

### Key Takeaways

- **SARS-CoV-2 infections among residents of nursing homes in the US decreased among both vaccinated and unvaccinated residents over time following vaccination clinics that administered mRNA COVID-19 vaccines. Cases occurred in 4.5% of vaccinated residents within 0-14 days after the first dose and declined to 0.3% of vaccinated residents 14 days after the second dose. A similar pattern was observed among unvaccinated residents, which the authors suggest indicates that high vaccination coverage, along with existing mitigation measures, conferred a degree of herd immunity among unvaccinated nursing home residents.** [More](#)
- **Having at least one SARS-CoV-2 infection occurring in childcare facilities in Washington, DC was relatively common (24% of facilities reporting infections from July to December, 2020), but epidemiologically linked cases within a particular facility that suggested an outbreak were much less frequent (only 6% of facilities). Facility outbreaks were associated with the presence of an asymptomatic infection, delays in seeking testing after the development of symptoms, and newer facilities (<3 years of operation).** [More](#)
- **Low levels of Vitamin D (<20 ng/mL) measured prior to the COVID-19 pandemic in 2019 were not associated with the development of detectable anti-SARS-CoV-2 IgG antibodies (OR=1.04, 95% CI=0.88-1.22) after adjustment for age, sex, and other confounders in a large cohort study (n=18,148). The lack of an association persisted in analyses with a higher cutoff of <30 ng/mL, with Vitamin D levels measured during the pandemic, and with propensity score analyses.** [More](#)

### Transmission

- 24% of 469 licensed childcare facilities in Washington, DC reported at least one SARS-CoV-2 infection from July to December 2020, but facility-associated outbreaks (defined as two or more linked cases within a facility) only occurred in 6% of facilities. Among the 316 total cases, 56% were among teachers or staff and 49% occurred during outbreaks. Facilities were at increased risk for an outbreak if they had been operating for <3 years (RR=3.3; 95%CI 1.4-7.8), if symptomatic persons sought testing  $\geq 3$  days after symptom onset (RR=2.0; 95%CI 1.0-4.0), or if persons with asymptomatic SARS-CoV-2 infections were at the facility (RR=2.1; 95%CI 1.1-4.0). 100% of facilities reported mandatory mask wearing by teachers and staff and more than 90% limited class sizes and sent symptomatic employees home immediately.

Kim et al. (May 21, 2021). Characteristics of COVID-19 Cases and Outbreaks at Child Care Facilities — District of Columbia, July–December 2020. *MMWR*.  
<https://doi.org/10.15585/mmwr.mm7020a3>

## Testing and Treatment

- The immunosuppressive monoclonal antibody treatment tocilizumab (TCZ) was associated with a 11% reduction in risk for all-cause 28- and 30-day mortality compared to placebo/control in a systematic review and meta-analysis of 8 randomized trials, which included 6,481 patients mostly with severe but non-critical COVID-19. TCZ was also associated with reduced risk of mechanical ventilation, ICU admission, and superinfection. However, no mortality benefit was demonstrated among the subgroup of critically ill patients or in trials where >80% of patients used steroids.

Avni et al. (May 19, 2021). Tocilizumab in the Treatment of COVID-19 - a Meta-Analysis. *QJM: An International Journal of Medicine*. <https://doi.org/10.1093/qjmed/hcab142>

## Vaccines and Immunity

- The incidence of SARS-CoV-2 infections among a sample of residents of nursing homes in the US who received an mRNA COVID-19 vaccine (n=18,242, 80% Pfizer-BioNTech vaccine) decreased from 4.5% within 0-14 days after the first dose to 1.4% within 15-28 days after the first dose. Cases occurring 14 or more days after the second dose among those who received it (n=14,669) was even lower at 0.3%. Incident cases among unvaccinated residents (n=3,990) also decreased from 4.3% within 0-14 days after the first vaccination clinic to 0.3% at >42 days after the clinic. The authors suggest that high vaccination coverage, along with existing mitigation measures, conferred a certain degree of herd immunity among unvaccinated residents.

White et al. (May 19, 2021). Incident SARS-CoV-2 Infection among mRNA-Vaccinated and Unvaccinated Nursing Home Residents. *New England Journal of Medicine*.  
<https://doi.org/10.1056/NEJMc2104849>

- [Pre-print, not peer-reviewed] A cross-sectional survey conducted among a representative US sample (n=2,895, 38% vaccinated) in March 2021 found that among those who were vaccine hesitant (n=522), major concerns were vaccine side-effects and efficacy (78%) and mistrust of the government or vaccines (38%). Among those with intent to initiate vaccination (n=1,326), most common barriers included struggles to secure vaccine appointments (39%) and distance from vaccination sites (9%). On average, participants prioritized ease and preferred single-dose vaccines and reduced waiting times at vaccination sites. Vaccine enforcement reduced overall vaccine acceptance, with a trend of increasing control aversion with increasing vaccine hesitancy, particularly among those who were young, African American, or Republican.

Eshun-Wilson et al. (May 19, 2021). Strategies That Make Vaccination Easy and Promote Autonomy Could Increase COVID-19 Vaccination in Those Who Remain Hesitant. Pre-print downloaded May 20 from <https://doi.org/10.1101/2021.05.19.21257355>

- Elevated levels of autoantibodies (AAbs) targeting extracellular and secreted proteins that modulate immune response were detected in a cohort of COVID-19 patients (n=194) but not in uninfected controls (n=30). *In vitro* analysis of the plasma concentrations of these targeted proteins indicate altered immunoreceptor signaling and peripheral immune cell composition, suggesting that the

AAbs can impair immune function and virologic control. *In vivo* experiments with mice infected with SARS-CoV-2 demonstrated that the AAbs can exacerbate disease severity.

Wang et al. (May 19, 2021). *Diverse Functional Autoantibodies in Patients with COVID-19*. *Nature*. <https://doi.org/10.1038/s41586-021-03631-y>

- An analysis of reported adverse events following vaccination with an mRNA COVID-19 vaccine indicates that the reported number of thrombocytopenia cases does not suggest a safety concern attributable to mRNA COVID-19 vaccines at this time. Fifteen cases of thrombocytopenia were identified among 18,841,309 doses of Pfizer-BioNTech vaccine and 13 cases among 16,260,102 doses of Moderna vaccine according to an analysis by the FDA of the Vaccine Adverse Event Reporting System (VAERS) up to February 4, 2021, corresponding to a reporting rate of 0.8 per million doses for both vaccines. By contrast, the annual incidence of immune thrombocytopenia, which is included in some of the observed cases, is 3.3 per 100,000 adults.

Welsh et al. (Apr 30, 2021). *Thrombocytopenia Including Immune Thrombocytopenia after Receipt of MRNA COVID-19 Vaccines Reported to the Vaccine Adverse Event Reporting System (VAERS)*. *Vaccine*. <https://doi.org/10.1016/j.vaccine.2021.04.054>

### Clinical Characteristics and Health Care Setting

- Low levels of Vitamin D (<20 ng/mL) was not associated with positivity for anti-SARS-CoV-2 IgG antibodies (OR=1.04, 95% CI=0.88-1.22), after adjustment for confounders in a large cohort study of US employees and spouses of Quest Diagnostics (n=18,148). Vitamin D levels were measured prior to the pandemic in 2019 and results were adjusted for age, sex, race/ethnicity, education, body mass index, blood pressure, smoking status, and geographical location. The lack of a significant association with antibody positivity persisted even with a higher cutoff of <30 ng/mL, analysis using Vitamin D levels measured during the pandemic, and with propensity score analyses.

Li et al. (May 19, 2021). *Assessment of the Association of Vitamin D Level With SARS-CoV-2 Seropositivity Among Working-Age Adults*. *JAMA Network Open*. <https://doi.org/10.1001/jamanetworkopen.2021.11634>

- In a single-center cohort study of patients hospitalized for acute COVID-19 (n=698), 15 patients were identified with multisystem inflammatory syndrome for adults (MIS-A). The 15 MIS-A patients had acute COVID-19 symptoms, and for MIS-A patients with prior admission for acute COVID-19 (n=3), the median interval between acute COVID-19 admission and MIS-A admission was 23 days. MIS-A patients had a median of 4 organ systems involved. While 5 MIS-A patients required intensive care treatment, no participants died. MIS-A patients were younger than acute COVID-19 patients (median age 45 years vs 57 years).

Davogustto et al. (May 19, 2021). *Characteristics Associated With Multisystem Inflammatory Syndrome Among Adults With SARS-CoV-2 Infection*. *JAMA Network Open*. <https://doi.org/10.1001/jamanetworkopen.2021.10323>

- Persistent COVID-19 symptoms 30 days and 60 days after symptom onset were present in 53% and 35% of participants, respectively, in a population-based survey in Michigan (n=593). Prevalence of 30-day and 60-day symptoms was 40% higher in hospitalized patients than in non-hospitalized patients, while those who reported very severe symptoms (vs mild) had a 2-fold higher prevalence of 30-day and 60-day symptoms.

Hirschtick et al. (May 19, 2021). Population-Based Estimates of Post-Acute Sequelae of SARS-CoV-2 Infection (PASC) Prevalence and Characteristics. *Clinical Infectious Diseases*.  
<https://doi.org/10.1093/cid/ciab408>

#### Other Resources and Commentaries

- [How COVID Is Changing the Study of Human Behaviour](#) – Nature (May)
- [Mutation Rate of SARS-CoV-2 and Emergence of Mutators during Experimental Evolution](#) – BioRxiv (May 19)
- [Heterogeneity in COVID-19 Patient Volume, Characteristics and Outcomes across US Department of Veterans Affairs Facilities: An Observational Cohort Study](#) – BMJ Open (Mar)
- [The Multisystem Inflammatory Syndrome in Adults With SARS-CoV-2 Infection-Another Piece of an Expanding Puzzle](#) – JAMA Network Open (May)
- [Covid-19 Vaccines: In the Rush for Regulatory Approval, Do We Need More Data](#) – BMJ (May 18)
- [Daily Briefing: Why It Took so Long to Grapple with Airborne COVID-19](#) – Nature (May)
- [Consumer Views on Using Digital Data for COVID-19 Control in the United States](#) – JAMA Network Open (May 19)
- [Data and Safety Monitoring of COVID-19 Vaccine Clinical Trials](#) – The Journal of Infectious Diseases (May)
- [Interventions Targeting Non-Symptomatic Cases Can Be Important to Prevent Local Outbreaks: SARS-CoV-2 as a Case Study](#) – Journal of the Royal Society, Interface (May)
- [Delivering Hospice Care During the COVID-19 Pandemic: Meeting Nursing Home Residents' Needs](#) – Journal of Hospice and Palliative Nursing : JHPN : The Official Journal of the Hospice and Palliative Nurses Association (May)
- [Reassessing the Association of Vitamin D Level With SARS-CoV-2 Seropositivity](#) – JAMA Network Open (May 19)
- [SARS-CoV-2 Vaccines: Anamnestic Response in Previously Infected Recipients](#) – Cell Research (May 18)
- [Equitable Allocation of COVID-19 Vaccines in the United States](#) – Nature Medicine (May)
- [Decline in COPD Admissions During the COVID-19 Pandemic Associated with Lower Burden of Community Respiratory Viral Infections](#) – MedRxiv (May 19)
- [Using a Systems-Focused Simulation to Rapidly Prepare for Large Volume COVID-19 Vaccination](#) – Simulation in Healthcare: The Journal of the Society for Simulation in Healthcare (Mar 18)
- [A Rapid, Accurate, Scalable, and Portable Testing System for COVID-19 Diagnosis](#) – Nature Communications (May)
- [Economic Impact Payment Human Mobility and the COVID-19 Mitigation in the United States](#) – MedRxiv (May 19)
- [Vaccination and Three Non-Pharmaceutical Interventions Determine the End of COVID-19 at 381 Metropolitan Statistical Areas in the US](#) – MedRxiv (May 20)

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