



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

April 26, 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

- ② **The Pfizer-BioNTech vaccine showed 70% effectiveness against SARS-CoV-2 infection 21 days after the first dose and 85% seven days after the second dose among hospital staff in the UK.** [More](#)
- ② **Cerebral venous sinus thrombosis, which occurs when a blood clot prevents blood from properly flowing out of the brain, was not significantly associated with the Pfizer-BioNTech, Moderna, or Johnson & Johnson COVID-19 vaccines in an analysis of vaccinations in the Mayo Clinic hospital system through March 15, 2021.** [More](#)
- **A low frequency of SARS-CoV-2 re-infection (0.7%) was identified in a large cohort of patients who received serial tests in the US between December 1, 2019 and November 13, 2020. Asthma (OR = 1.9) and nicotine or tobacco use (OR = 2.7) were associated with greater odds of re-infection.** [More](#)

### Vaccines and Immunity

- *[Pre-print, not peer-reviewed]* Among individuals who were breastfeeding and received an mRNA SARS-CoV-2 vaccine (n = 180, 71% Pfizer-BioNTech, 29% Moderna), >85% reported experiencing side effects following either dose. Those who received the Moderna vaccine were significantly more likely to report systemic side effects after the second dose like fever, chills, and vomiting, in addition to localized injection site reactions. Some participants also reported a reduction in milk supply, which in all cases returned to normal within 72 hours. Few events were reported for children after the second dose, and all were non-serious, including irritability (10% for both vaccines), poor sleep (8% for both vaccines), and drowsiness (0% for Pfizer vs. 6% for Moderna). *Bertrand et al. (Apr 25, 2021). Maternal and Child Outcomes Reported by Breastfeeding Women Following MRNA COVID-19 Vaccination. Pre-print downloaded Apr 26 from <https://doi.org/10.1101/2021.04.21.21255841>*
- Cellular assays evaluating antibody-dependent cellular cytotoxicity (ADCC) combined with assessments of antibody titers and neutralization activity indicated that asymptomatic infection with SARS-CoV-2 induces a polyfunctional antibody response. In this study, antibody responses were slightly lower among asymptomatic than symptomatic individuals, but did not differ in neutralization activity or the ability to trigger ADCC and complement deposition. *Dufloo et al. (Apr 2021). Asymptomatic and Symptomatic SARS-CoV-2 Infections Elicit Polyfunctional Antibodies. Cell Reports. Medicine. <https://www.sciencedirect.com/science/article/pii/S2666379121001038h>*



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- [Pre-print, not peer-reviewed]* A population-based study in Israel found that the level of protection against reinfection conferred by prior infection with SARS-CoV-2 within the last 6 months was similar to that elicited by the Pfizer-BioNTech vaccine among people who had no prior infection. Vaccine effectiveness against severe disease was 66% for individuals followed from the day of the first dose until 6 days after the second dose. Overall vaccine efficacy was 94% for those followed from a week after the second dose and beyond.

Goldberg et al. (Apr 24, 2021). *Protection of Previous SARS-CoV-2 Infection Is Similar to That of BNT162b2 Vaccine Protection A Three-Month Nationwide Experience from Israel*. Pre-print downloaded Apr 26 from <https://www.medrxiv.org/content/10.1101/2021.04.20.21255670v1>
- The Pfizer-BioNTech vaccine showed 70% effectiveness against SARS-CoV-2 infection 21 days after the first dose, and 85% effectiveness 7 days after two doses among staff working in publicly-funded hospitals in the UK. Participants were followed for two months, for a total of 1,106,905 person-days. During follow-up, 977 new infections occurred among unvaccinated individuals (14 per 10,000 person-days), compared to 71 infections 21 or more days after dose 1 in the vaccinated group (8 per 10,000 person-days) and 9 infections one week after the second dose (4 per 10,000 person-days). Among unvaccinated individuals who were infected, 543 (56%) had typical COVID-19 symptoms and 140 (14%) were asymptomatic within 14 days of testing positive, compared with infections in the vaccinated cohort, where 29 (36%) individuals had typical COVID-19 symptoms and 15 (19%) were asymptomatic.

Hall et al. (Apr 26, 2021). *COVID-19 Vaccine Coverage in Health-Care Workers in England and Effectiveness of BNT162b2 MRNA Vaccine against Infection (SIREN): A Prospective, Multicentre, Cohort Study*. *The Lancet*. [https://doi.org/10.1016/S0140-6736\(21\)00790-X](https://doi.org/10.1016/S0140-6736(21)00790-X)
- Among healthcare workers at a hospital in the UK, increased coverage (8.3% to 82.5%) of at least one dose of the Pfizer-BioNTech vaccination was associated with significant reductions in symptomatic and asymptomatic cases of SARS-CoV-2. There was a significant negative correlation between cumulative vaccination and PCR positive cases ( $R = -0.91$ ), along with a marked negative correlation between symptomatic PCR testing rates and vaccine coverage ( $R = -0.90$ ). The number of staff self-isolating due to SARS-CoV-2 dropped from 325 on January 11<sup>th</sup> to 91 by February 23<sup>rd</sup> (72% decrease). The proportion of positive tests from asymptomatic screening was maintained over the study period.

Lillie et al. (Apr 24, 2021). *First Dose of BNT162b2 MRNA Vaccine in a Health Care Worker Cohort Is Associated with Reduced Symptomatic and Asymptomatic SARS-CoV-2 Infection*. *Clinical Infectious Diseases*. <https://doi.org/10.1093/cid/ciab351>
- The SARS-CoV-2 B.1.1.7 variant was 45% more transmissible than the original strain in Israel, and was identified in more than 90% of positive tests by February 4<sup>th</sup>, according to an analysis of nearly 300,000 RT-PCR samples collected between December 6, 2020 and February 10, 2021. The authors note that surveillance programs and prioritized vaccination, which initially focused on the elderly population, quickly prevented B.1.1.7-associated infections among this group. The study found a sharp decline in cases when ~50% of older adults were two weeks post-receipt of their first dose, at a time when the B.1.1.7 variant gained transmission dominance among those aged 0-59.

Munitz et al. (Apr 2021). BNT162b2 Vaccination Effectively Prevents the Rapid Rise of SARS-CoV-2 Variant B.1.1.7 in High Risk Populations in Israel. *Cell Reports Medicine*.

<https://doi.org/10.1016/j.xcrm.2021.100264>

- [Pre-print, not peer-reviewed] Cerebral venous sinus thrombosis (CVST), which occurs when a blood clot prevents blood from properly flowing out of the brain, was rare and not significantly associated with COVID-19 vaccines in a study conducted among individuals who received the Pfizer-BioNTech (n = 94,818 doses), Moderna (n = 36,350 doses) and Johnson & Johnson vaccines (n = 1,745 doses), as well as those who received one of 10 FDA-approved non-COVID-19 vaccines (n = 771,805 doses) at the Mayo Clinic hospital system between January 1, 2017 and March 15, 2021. 3 cases of CVST were observed within the 30 days following Pfizer-BioNTech vaccination (2 females, 1 male; ages 79, 80, 84), including one individual with a prior history of thrombosis and another with trauma in the past 30 days. No cases of CVST were observed among the patients receiving Moderna or Johnson & Johnson vaccines.

Pawlowski et al. (Apr 23, 2021). *Cerebral Venous Sinus Thrombosis (CVST) Is Not Significantly Linked to COVID-19 Vaccines or Non-COVID Vaccines in a Large Multi-State US Health System*. Pre-print downloaded Apr 26 from <https://doi.org/10.1101/2021.04.20.21255806>

- A low frequency of SARS-CoV-2 re-infection (0.7%) was identified in a large cohort of patients (n = 9,119) who received serial tests at 62 health care facilities in the United States between December 1, 2019 and November 13, 2020. Re-infection was defined as two positive tests separated by an interval of more than 90 days along with confirmed resolution with two or more consecutive negative tests after the first positive test. Asthma (OR = 1.9) and nicotine or tobacco use (OR = 2.7) were associated with greater odds of re-infection. Re-infection appeared milder than initial infection in most cases. There were two deaths (3.2%) associated with re-infection.

Qureshi et al. (Apr 25, 2021). *Re-Infection with SARS-CoV-2 in Patients Undergoing Serial Laboratory Testing*. *Clinical Infectious Diseases*. <https://doi.org/10.1093/cid/ciab345>

- Between December 8, 2020, and February 22, 2021, receipt of the first dose of the Pfizer-BioNTech vaccine in Scotland was associated with a vaccine effectiveness of 91% for reduced COVID-19 hospital admission at 28–34 days post-vaccination, and 88% for the Oxford-AstraZeneca vaccine. Over the study period, a total of 1,331,993 individuals who had not previously tested positive for SARS-CoV-2 were vaccinated. Vaccine efficacy against hospital admission due to COVID-19 was similar (83%) when restricting the analysis to those aged 80 years and older.

Vasileiou et al. (Apr 26, 2021). *Interim Findings from First-Dose Mass COVID-19 Vaccination Roll-out and COVID-19 Hospital Admissions in Scotland: A National Prospective Cohort Study*. *The Lancet*. [https://doi.org/10.1016/S0140-6736\(21\)00677-2](https://doi.org/10.1016/S0140-6736(21)00677-2)

## Modeling and Prediction

- A modeling study determined that, in the absence of SARS-CoV-2 vaccines available to children, identifying 10-20% of “silent” or asymptomatic infections among children within 3 days after infection would reduce attack rates below 5% if only adults were vaccinated. Using an age-structured disease transmission model parameterized with census data, the study also found that if silent infections among children remained undetected, achieving the same attack rate

would require a high vaccination coverage ( $\geq 81\%$ ) of this age group in addition to vaccination of adults, which the authors deemed unrealistic.

Moghadas et al. (Apr 2021). *Simulated Identification of Silent COVID-19 Infections Among Children and Estimated Future Infection Rates With Vaccination*. *JAMA Network Open*.

<https://doi.org/10.1001/jamanetworkopen.2021.7097>

- A model calibrated to King County, Washington that includes the increased transmissibility of the B.1.1.7 variant, and local policy changes regarding openings and restrictions, found a new subsequent wave of infections was permitted in all scenarios. However, the new wave had fewer deaths expected compared to the prior wave due to vaccination of people at high risk for mortality. In addition, the authors suggest that vaccination is highly important in King County because the restrictions implemented during the prior wave led to a lower seroprevalence entering the vaccination phase of the epidemic. The model predicted that B.1.1.7 would become dominant between April and June of 2021.

Reeves et al. (Apr 2021). *Rapid Vaccination and Early Partial Lockdown Minimizes 4th Waves from Emerging Highly Contagious SARS-CoV-2 Variants*. *Med*.

<https://doi.org/10.1016/j.medj.2021.04.012>

## Public Health Policy and Practice

- A study comparing person-based contact tracing for SARS-CoV-2 among people experiencing homelessness (PEH) compared to the general population in Utah between March and May 2020 found that PEH were more likely to be lost to follow-up at the end of isolation (14%), provided fewer contacts per case (0.31), and their contacts were more often unreachable (13% vs. 7%). The authors suggest that contract tracing among PEH should employ location-based approaches, which focus on asking a person with COVID-19 where they have been, along with a person-based approach when possible.

Fields et al. (Apr 2021). *Assessment of Contact Tracing for COVID-19 among People Experiencing Homelessness, Salt Lake County Health Department, March-May 2020*. *Annals of Epidemiology*.

<https://doi.org/10.1016/j.annepidem.2021.04.002>

- Five of 255 neonates (2.2%) born to women who tested positive for SARS-CoV-2 within 2 weeks before and 72 hours after delivery also tested positive for SARS-CoV-2 (88% of newborns were tested). A positive neonatal test was associated with higher maternal social vulnerability (aOR = 5.0). Adverse outcomes during hospitalization were associated with preterm delivery and with worsening maternal COVID-19 symptoms. Data were obtained from a multicenter cohort study in hospitals in Massachusetts between March 1 and July 31, 2020.

Angelidou et al. (Apr 23, 2021). *Association of Maternal Perinatal SARS-CoV-2 Infection With Neonatal Outcomes During the COVID-19 Pandemic in Massachusetts*. *JAMA Network Open*.

<https://doi.org/10.1001/jamanetworkopen.2021.7523>

## Other Resources and Commentaries

- [Are Countries' Precautionary Actions against COVID-19 Effective? An Assessment Study of 175 Countries Worldwide](#) – Saudi Pharmaceutical Journal (Apr)
- [COVID-19 Protective Measures Prevent the Spread of Respiratory and Intestinal Infectious Diseases but Not Sexually Transmitted and Bloodborne Diseases](#) – Journal of Infection (Apr)

- [Red Media, Blue Media, Trump Briefings, and COVID-19: Examining How Information Sources Predict Risk Preventive Behaviors via Threat and Efficacy](#) – Health Communication (Apr)
- [Transmission Characteristics of SARS-CoV-2 Variants of Concern Rapid Scoping Review](#) – MedRxiv (Apr 25)
- [The Emergence of New Strains of SARS-CoV-2. What Does It Mean for COVID-19 Vaccines](#) – Expert Review of Vaccines (Apr 25)
- [Computational Investigation Reveals That the Mutant Strains of SARS-CoV2 Are Highly Infectious than Wildtype](#) – BioRxiv (Apr 23)
- [Population Immunity and Vaccine Protection against Infection](#) – The Lancet (Apr 26)
- [Household Transmission of SARS-CoV-2 from Humans to Dogs in Washington and Idaho Burden and Risk Factors](#) – BioRxiv (Apr 26)
- [Comparing Mental Health Trajectories of Four Different Types of Key Workers with Non-Key Workers A 12-Month Follow-up Observational Study of 21874 Adults in England during the COVID-19 Pandemic](#) – MedRxiv (Apr 23)
- [A Systematic Review and Meta-Analysis of Discharged COVID-19 Patients Retesting Positive for RT-PCR](#) – EClinicalMedicine (Apr)
- [Resurgence of SARS-CoV-2: Detection by Community Viral Surveillance](#) – Science (New York, N.Y.) (Apr)
- [Cardiac Corrected QT Interval Changes Among Patients Treated for COVID-19 Infection During the Early Phase of the Pandemic](#) – JAMA Network Open (Apr)
- [The Importance of a Timely Second Dose of the 2021 COVID-19 mRNA Vaccine Depends on the Protection Afforded by a First Dose and Subsequent Risk of Anaphylaxis](#) – The Journal of Allergy and Clinical Immunology: In Practice (Apr)
- [Trans-Ancestry Analysis Reveals Genetic and Nongenetic Associations with COVID-19 Susceptibility and Severity](#) – Nature Genetics (Apr 22)
- [Intra-Household and Close-Contact SARS-CoV-2 Transmission Among Children – a Systematic Review](#) – Frontiers in Pediatrics (Apr 9)
- [Low Secondary Transmission Rates of SARS-CoV-2 Infection among Contacts of Construction Laborers at Open Air Environment](#) – GERMS (Mar 15)
- [Correlates of Neutralization Against SARS-CoV-2 Variants of Concern by Early Pandemic Sera](#) – Journal of Virology (Apr)
- [Association between County-Level Social Capital and the Burden of COVID-19 Cases and Deaths in the United States](#) – Annals of Epidemiology (Apr)

*Report prepared by the UW Alliance for Pandemic Preparedness and Global Health Security and the START Center in collaboration with and on behalf of WA DOH COVID-19 Incident Management Team*