



2019-nCoV Literature Situation Report (Lit Rep)

April 22, 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 SARS-CoV-2 breakthrough infections (infection ≥ 14 days after the second vaccine dose) were detected in a cohort of 417 university employees in New York City. Both were previously healthy without known risk factors. Viral genome sequencing revealed variants of likely clinical importance. [More](#)
- The single-dose Johnson & Johnson vaccine protects against moderate to severe-critical COVID-19 with 67% efficacy at disease onset ≥ 14 days after administration and 66% at ≥ 28 days. Among participants in South Africa where 94.5% of cases had the B.1351 variant, vaccine efficacy was 52% at onset ≥ 14 days and 64% at onset ≥ 28 days against moderate to severe-critical COVID-19. [More](#)
- Women who reported completing pregnancy after receiving a COVID-19 vaccine reported adverse pregnancy and neonatal outcomes in similar proportions to prior studies conducted before the COVID-19 pandemic. [More](#)
- In an analysis of databases from the US Department of Veterans Affairs, COVID-19 patients who survived beyond the first 30 days of illness had a 1.6-fold increased risk of death compared to those who did not have COVID-19 and were not hospitalized, and a 1.5-fold increased risk of death compared to those hospitalized for influenza. [More](#)

Non-Pharmaceutical Interventions

- 99% of SARS-CoV-2 infections identified by testing campaigns were asymptomatic among employees of a US manufacturing company that remained open during the COVID-19 pandemic. A total of 105 positive PCR results were identified among 586 employees across three sites from March to August 2020. Employee positivity rates were consistent with community prevalence. In addition to testing campaigns, the company also followed distancing, masking, hand hygiene and ventilation mitigation measures, and implemented expanded sick leave.

Haigh and Gandhi. (Feb 22, 2021). COVID-19 Mitigation With Appropriate Safety Measures in an Essential Workplace: Lessons for Opening Work Settings in the United States During COVID-19. Open Forum Infectious Diseases. <https://doi.org/10.1093/ofid/ofab086>

Transmission

- COVID-19 outbreaks occurred in 5 correctional facilities in Idaho with work-release programs between July and November 2020, leading to 382 outbreak-related cases. 64% of cases were



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identified through mass testing, with only 14% identified as symptomatic cases. Mitigation strategies at the correctional facilities included mandatory mask wearing and mass testing. Two outbreaks were linked to work at food processing plants.

Dunne et al. (Apr 23, 2021). COVID-19 Outbreaks in Correctional Facilities with Work-Release Programs — Idaho, July–November 2020. MMWR. Morbidity and Mortality Weekly Report.

<https://doi.org/10.15585/mmwr.mm7016a3>

- Within a cohort of National Basketball Association (NBA) players, staff, and vendors (n=3,648) who maintained a closed environment in Florida from June to October 2020, 36 individuals (1%) had persistently positive PCR results after recovering from SARS-CoV-2 infection. There were no transmission events associated with these persistently positive individuals, who were monitored for an average of 51 days, during which there were at least 1,480 person-days of direct exposure activities in indoor environments without masks. Antibodies were detected in 33 individuals (92%), and all remained asymptomatic following the initial persistent positive PCR result.

Mack et al. (Apr 22, 2021). SARS-CoV-2 Transmission Risk Among National Basketball Association Players, Staff, and Vendors Exposed to Individuals With Positive Test Results After COVID-19 Recovery During the 2020 Regular and Postseason. JAMA Internal Medicine.

<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2779287>

Geographic Spread

- *[Pre-print, not peer-reviewed]* A SARS-CoV-2 B.1.1.7 sequence from Pennsylvania detected in March 2021 was found to have the E484K spike substitution, a mutation shown to confer resistance to neutralizing antibodies. Only 60 isolates with the B.1.1.7+E484K sequence profile have been detected in the US, and only 253 reported globally. Comparative genomic *analysis* of 235 high coverage genomes suggests at least 7 independent acquisitions of the E484K substitution by the B.1.1.7 lineage.

Ahmed et al. (Apr 21, 2021). Comparative Analysis of Emerging B.1.1.7+E484K SARS-CoV-2 Isolates from Pennsylvania. Pre-print downloaded Apr 22 from

<https://www.biorxiv.org/content/10.1101/2021.04.21.440801v1.full.pdf>

Testing and Treatment

- *[Pre-print, not peer-reviewed]* An international interlaboratory trial observed 100% concordance in using "direct" RT-PCR across the 10 included laboratories (3 in US, including the University of Washington Virology Lab [UWVL]). "Direct" or "extraction-less" RT-PCR is an inexpensive alternative to conventional RT-qPCR that does not require a resource intensive RNA extraction step. The assay was found to have 99.6% sensitivity and 100% specificity across participating laboratories in discerning 5 negative and 25 positive samples prepared by the UWVL. There was high intralaboratory correlation for cycle threshold (Ct value), including samples with low concentrations of virus (high Ct values).

Mills et al. (Apr 16, 2021). An International, Interlaboratory Ring Trial Confirms the Feasibility of an Open-Source, Extraction-Less "Direct" RT-QPCR Method for Reliable Detection of SARS-CoV-2 RNA in Clinical Samples. Pre-print downloaded Apr 22 from

<https://pubmed.ncbi.nlm.nih.gov/33880478/>

- 0.8% of passengers arriving to Alaska from June to November 14, 2020 tested positive for SARS-CoV-2 (951 of 126,000 tests). Passengers tested on arrival made up roughly a third of all air travelers arriving in Alaska during the study period, as other travelers opted to be tested within 72 hours before arrival or to self-quarantine without testing after arrival. Airport testing positivity largely remained <1% and peaked at 2.6% during October to November. Testing on arrival positivity rates were consistently lower than overall state positivity rates.

Ohlsen et al. (Apr 23, 2021). Airport Traveler Testing Program for SARS-CoV-2 — Alaska, June–November 2020. MMWR. Morbidity and Mortality Weekly Report.

<https://doi.org/10.15585/mmwr.mm7016a2>

Vaccines and Immunity

- *[Pre-print, not peer-reviewed]* The Pfizer-BioNTech vaccine was 86% effective in preventing infection >7 days after the second dose in a cohort study (n=806,000) in Sweden from December 2020 to February 2021. Effectiveness was only 42% >14 days after a single dose. The vaccinated population largely consisted of healthcare workers. SARS-CoV-2 incidence among unvaccinated individuals with a prior positive PCR test was considerably lower than among those without a prior positive test (28 vs. 294 cases per 100,000 person-weeks), suggesting that prior SARS-CoV-2 infection is 91% effective in preventing subsequent infection.

Bjork et al. (Apr 21, 2021). Effectiveness of the BNT162b2 Vaccine in Preventing COVID-19 in the Working Age Population - First Results from a Cohort Study in Southern Sweden. Pre-print downloaded Apr 22 from <https://www.medrxiv.org/content/10.1101/2021.04.20.21254636v1>

- 2 SARS-CoV-2 breakthrough infections (infection \geq 14 days after the second vaccine dose) were detected in a cohort of 417 employees at the Rockefeller University in New York City. Clinical symptoms of COVID-19 developed 19 days after Patient 1 (51-year-old woman) received their second dose of the Moderna vaccine, and 36 days after Patient 2 (65-year old woman) received their second dose of the Pfizer-BioNTech vaccine. Both patients were healthy and had typical clinical responses to the second dose. Viral genome sequences from both patients show that neither was infected with wild-type SARS-CoV-2. Specifically, the sequence from Patient 1 contained spike mutations including E484K, which is known to confer resistance to neutralizing antibodies. The sequences did not precisely fit any known clade.

Hacisuleyman et al. (Apr 21, 2021). Vaccine Breakthrough Infections with SARS-CoV-2 Variants. New England Journal of Medicine. <https://doi.org/10.1056/NEJMoa2105000>

- *[Pre-print, not peer-reviewed]* 89% of 186 dialysis patients developed anti-SARS-CoV-2 spike antibodies following two doses of mRNA vaccines (Pfizer-BioNTech and Moderna). Among patients without prior SARS-CoV-2 infection (n=148), the seropositivity rate was 86%. A majority (70%) of seropositive patients had maximum titers for anti-spike IgG antibodies at least 14 days after the second dose. No significant differences were observed between the two vaccines.

Lacson et al. (Apr 13, 2021). Immunogenicity of SARS-CoV-2 Vaccine in Dialysis. Pre-print downloaded Apr 22 from <https://doi.org/10.1101/2021.04.08.21254779>

- The SARS-CoV-2 single-dose adenovirus vector vaccine Ad26.COV2.S (Johnson & Johnson) protected against moderate to severe-critical COVID-19 \geq 14 days after administration with 66.9% efficacy (95% CI: 59-73.4%) in a randomized, double-blind placebo-controlled phase 3 trial. 116

cases occurred among those receiving the vaccine (n=19,691) vs 348 cases in the placebo group (n=19,691). Efficacy ≥ 28 days after administration was 66.1% (66 vs 193 cases; 95% CI: 55-74.8%). Vaccine efficacy against severe-critical COVID-19 was 76.7% at onset ≥ 14 days and 85.4% at onset ≥ 28 days.

- Among participants in South Africa where 94.5% (86 of 91) of cases had the B.1351 variant, vaccine efficacy was 52% at onset ≥ 14 days and 64% at onset ≥ 28 days against moderate to severe-critical COVID-19. Efficacy against severe-critical COVID-19 was 73.1% at onset ≥ 14 days and 81.7% at onset ≥ 28 days.
- While serious adverse events were balanced across the vaccine and placebo groups, imbalance towards the vaccine group were observed for thromboembolic events (11 vs. 3 cases), seizure (4 vs 1 cases), and tinnitus (6 vs 0 cases). The authors could not determine a causal relationship with the vaccine.

Sadoff et al. (Apr 21, 2021). Safety and Efficacy of Single-Dose Ad26.COV2.S Vaccine against Covid-19. New England Journal of Medicine. <https://doi.org/10.1056/NEJMoa2101544>

- Among women in the V-safe pregnancy registry who reported completing pregnancy after receiving COVID-19 mRNA vaccines (Pfizer-BioNTech or Moderna) from December to February 201 (n=827), adverse pregnancy and neonatal outcomes occurred in similar proportions as previously studies of pregnant women conducted before the COVID-19 pandemic. 14% resulted in pregnancy loss, 86% resulted in live birth (most among those vaccinated during their third trimester). Preterm birth occurred in 9.4% and small size for gestational age in 3.2%. No neonatal deaths were reported.

Shimabukuro et al. (Apr 21, 2021). Preliminary Findings of mRNA Covid-19 Vaccine Safety in Pregnant Persons. New England Journal of Medicine. <https://doi.org/10.1056/NEJMoa2104983>

Clinical Characteristics and Health Care Setting

- COVID-19 patients who survived beyond the first 30 days of illness (n>73,000) had a 1.6-fold increased risk of death compared those who did not have COVID-19 and were not hospitalized (n>4.9 million), according to analysis of databases from the Department of Veterans Affairs. The cohort study also examined 6-month incident sequelae and found that COVID-19 survivors had 33.2-fold excess health burden spanning multiple organ systems including pulmonary, neurocognitive, and gastrointestinal disorders. The authors also compared patients hospitalized with COVID-19 to those hospitalized with seasonal influenza and determined that COVID-19 survivors had increased risk of death (HR=1.5; 1.3-1.8) and a higher burden of health care disorders spanning multiple organ systems.

Al-Aly et al. (Apr 22, 2021). High-Dimensional Characterization of Post-Acute Sequelae of COVID-19. Nature. <https://doi.org/10.1038/s41586-021-03553-9>

- In an international cohort study, pregnant women with COVID-19 (n=706) were at increased risk for preeclampsia/eclampsia, severe infections, ICU admissions, preterm birth, severe neonatal morbidity and severe perinatal morbidity and mortality compared to those without a COVID-19 diagnosis (n=1,424). Asymptomatic SARS-CoV-2 infection was only associated with increased risk for maternal morbidity and preeclampsia. 13% of neonates delivered from PCR-positive women also tested positive. Cesarean delivery, but not breastfeeding, was significantly associated with neonatal test positivity. Infants who tested positive for SARS-CoV-2 had considerably higher risk of requiring neonatal intensive care (RR=6, 3.3-10.9).

Villar et al. (Apr 22, 2021). Maternal and Neonatal Morbidity and Mortality Among Pregnant Women With and Without COVID-19 Infection: The INTERCOVID Multinational Cohort Study. *JAMA Pediatrics*. <https://doi.org/10.1001/jamapediatrics.2021.1050>

Mental Health and Personal Impact

- A retrospective analysis determined that the rate of abusive head trauma (AHT) had decreased substantially among children during the pandemic. AHT was used as a surrogate for child abuse, as the authors hypothesized that it would be more difficult for caregivers to forgo care than for non-life-threatening abuse. Mean monthly hospital admissions for AHT across 49 US hospitals were lower from March to September 2020 compared to the same period in 2017-2019. Of the 750 AHT-related admissions from March to September in 2017-2020, only 127 (16%) occurred in 2020.

Maassel et al. (Apr 20, 2021). Hospital Admissions for Abusive Head Trauma at Children's Hospitals During COVID-19. *Pediatrics*. <https://doi.org/10.1542/peds.2021-050361>

Modeling and Prediction

- *[Pre-print, not peer-reviewed]* A transmission model with vaccination parameters calibrated to the state of Colorado suggests that complete relaxation of non-pharmaceutical interventions (NPIs) within the next year when vaccination uptake is $\leq 70\%$ still risks exceeding hospitalization thresholds. The model also suggests that decisions to relax NPIs should account for regional heterogeneity in transmission and travel, and that premature relaxation of NPIs restricted to low-density regions could still exceed hospitalization thresholds.

Bianchin et al. (Apr 21, 2021). When Can We Safely Return to Normal A Novel Method for Identifying Safe Levels of NPIs in the Context of COVID-19 Vaccinations. Pre-print downloaded Apr 22 from <https://doi.org/10.1101/2021.04.20.21255350>

Other Resources and Commentaries

- [Mounting Evidence of Impaired Viral Control in Severe COVID-19](#) – The Lancet Microbe (Apr 15)
- [Ocular Manifestations of Hospitalized COVID-19 Patients in a Tertiary Care Academic Medical Center in the United States: A Cross-Sectional Study](#) – Clinical Ophthalmology (Jan 8)
- [Rethinking Vaccine Hesitancy among Minority Groups](#) – The Lancet (Apr)
- [Are Older People with Disabilities Neglected in the COVID-19 Pandemic](#) – The Lancet Public Health (Apr 21)
- [Navigating Attacks Against Health Care Workers in the COVID-19 Era](#) – JAMA (Apr 21)
- [Ivermectin against COVID-19: The Unprecedented Consequences in Latin America](#) – One Health (Apr 16)
- [Community-Academic Partnerships to Reduce COVID-19 Vaccine Hesitancy in Minoritized Communities](#) – EClinicalMedicine (Apr 15)
- [Covid-19: Spike in Cases in Chile Is Blamed on People Mixing after First Vaccine Shot](#) – BMJ (Apr 20)
- [Prediction of COVID-19 Cases during Tokyo's Olympic and Paralympic Games](#) – MedRxiv (Apr 21)
- [One Year of Pandemic Learning Response: Benefits of Massive Online Delivery of the World Health Organization's Technical Guidance](#) – JMIR Public Health and Surveillance (Apr 21)

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