

2019-nCoV Literature Situation Report (Lit Rep)

March 29, 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

- **The Pfizer/BioNTech and Moderna vaccines were 90% effective at preventing SARS-CoV-2 infection after full immunization and 80% after partial immunization, according to interim estimates among healthcare personnel and essential workers in the US.** [More](#)
- **The percentage of US adults reporting symptoms of an anxiety or depressive disorder in the past seven days increased from 36.4% in August 2020 to 41.5% in February 2021, and the percentage of those reporting an unmet mental health care need increased from 9.2% to 11.7%.** [More](#)
- ▣ **Nursing home residents who received a single dose of the BNT162b2 (Pfizer-BioNTech) vaccine and subsequently developed SARS-CoV-2 infection had significantly lower nasopharyngeal viral load than unvaccinated residents.** [More](#)

Non-Pharmaceutical Interventions

- A study of shelter-in-place (SIP) policies during the first wave of the COVID-19 pandemic (February 24 – May 30, 2020) in the US did not find the SIP policies impacted disease spread or deaths, but did impact mobility and unemployment. The authors note that SIP policies may not have made meaningful impacts on behaviors beyond the extent to which people were already engaging in sheltering or distancing behaviors.

Berry et al. (Apr 13, 2021). Evaluating the Effects of Shelter-in-Place Policies during the COVID-19 Pandemic. Proceedings of the National Academy of Sciences.

<https://doi.org/10.1073/pnas.2019706118>

Transmission

- *[Pre-print, not peer-reviewed]* A study of SARS-CoV-2 infection in four schools (A-D) with either remote or onsite learning determined that infections in schools reflected regional infection rates rather than learning modality type (remote vs. onsite). School A (mostly low-income Hispanic students, remote instruction) had the highest frequency of infection (9/70, 12.9%) and IgG positivity (13/70, 18.6%), while School D (middle and upper-middle income, white students, with predominantly onsite instruction) had the lowest frequency of infection and IgG positivity (1/86, 1.2%). Compliance with mitigation measures (physical distancing, 87.4%; wearing face coverings, 91.3%) was high at all schools.

Cooper et al. (Mar 26, 2021). SARS-CoV-2 Acquisition and Immune Pathogenesis Among School-Aged Learners in Four K-12 Schools. Pre-print downloaded Mar 29 from <https://doi.org/10.1101/2021.03.20.21254035>

- [Pre-print, not peer-reviewed] Computational fluid dynamics (CFD) simulations from Boeing showed that in an airplane cabin (Boeing 737), 80% of particles from a coughing person were removed 5-12 times faster than from a similar indoor commercial space, which resulted in 7 times less particulate mass inhaled.

Davis et al. (Mar 26, 2021). Comparison of Cough Particle Exposure for Indoor Commercial and Aircraft Cabin Spaces. Pre-print downloaded Mar 29 from <https://doi.org/10.1101/2021.03.24.21254275>

- Among nursing home residents in Pennsylvania with asymptomatic COVID-19 diagnosed through twice-weekly surveillance testing (n=10), residents who received a single dose of the BNT162b2 (Pfizer-BioNTech) vaccine had significantly lower nasopharyngeal viral load (-2.4 mean log₁₀ lower) than unvaccinated residents. The authors note their results suggest a single dose may start to reduce transmission among nursing home residents.

McEllistrem et al. (Mar 26, 2021). Single Dose of a MRNA SARS-CoV-2 Vaccine Is Associated with Lower Nasopharyngeal Viral Load among Nursing Home Residents with Asymptomatic COVID-19. *Clinical Infectious Diseases*. <https://doi.org/10.1093/cid/ciab263>

Vaccines and Immunity

- [Pre-print, not peer-reviewed] Vaccination with either the Pfizer-BioNTech or Oxford-AstraZeneca vaccines led to detectable anti-spike antibodies in nearly all participants in a study of adult healthcare workers (HCWs) in the UK. 3570/3610 (98.9%) HCWs were seropositive >14 days post-first vaccination and prior to second vaccination, 2706/2720 (99.5%) after Pfizer-BioNTech and 864/890 (97.1%) following Oxford-AstraZeneca vaccines. HCWs who had previously been infected or were younger were more likely to test seropositive post-first vaccination, with no evidence of differences by sex or ethnicity, and all HCWs tested >14 days after the second vaccine were seropositive. Antibody responses post-second vaccination were similar to those after prior infection and one vaccine dose.

Eyre et al. (Mar 26, 2021). Quantitative SARS-CoV-2 Anti-Spike Responses to Pfizer-BioNTech and Oxford-AstraZeneca Vaccines by Previous Infection Status. Pre-print downloaded Mar 29 from <https://doi.org/10.1101/2021.03.21.21254061>

- [Pre-print, not peer-reviewed] US counties with high levels of uninsured individuals had significantly lower COVID-19 vaccination rates and tended to have the highest COVID-19 incidence rates in March 2021 relative to December 2020, according to an analysis of data from over 1,500 counties (228 million individuals). Counties with higher percentages of Black and Hispanic individuals also had significantly lower vaccination rates, and smaller declines in COVID-incidence rates.

Lindemer et al. (Mar 26, 2021). Counties with Lower Insurance Coverage Are Associated with Both Slower Vaccine Rollout and Higher COVID-19 Incidence across the United States. Pre-print downloaded Mar 29 from <https://doi.org/10.1101/2021.03.24.21254270>

- *[Pre-print, not peer-reviewed]* Patients receiving hemodialysis had significantly lower anti-SARS-CoV-2 antibody titers than healthy controls 21 days after vaccination with the Pfizer-BioNTech vaccine (171 U/ml versus 2500 U/ml, respectively), according to a prospective cohort study (n = 81 patients, 80 controls). There was no correlation between antibody responses to the Hepatitis B vaccine and the SARS-CoV-2 vaccine.
Simon et al. (Mar 26, 2021). Hemodialysis Patients Show a Highly Diminished Antibody Response after COVID-19 mRNA Vaccination Compared to Healthy Controls. Pre-print downloaded Mar 29 from <https://doi.org/10.1101/2021.03.26.21254259>
- The mRNA vaccines (Pfizer/BioNTech and Moderna) were 90% effective at preventing SARS-CoV-2 infection after full immunization (≥ 14 days after second dose) and 80% after partial immunization (≥ 14 days after first dose but before second dose), according to interim estimates among 3,950 healthcare personnel, first responders, and other essential and frontline workers in multiple locations across the US. Study participants completed weekly SARS-CoV-2 testing for 13 consecutive weeks, from December 14-18, 2020 to March 13, 2021.
Thompson et al. (Mar 29, 2021). Interim Estimates of Vaccine Effectiveness of BNT162b2 and mRNA-1273 COVID-19 Vaccines in Preventing SARS-CoV-2 Infection Among Health Care Personnel, First Responders, and Other Essential and Frontline Workers — Eight U.S. Locations, December 2020–March. MMWR. Morbidity and Mortality Weekly Report. <https://doi.org/10.15585/mmwr.mm7013e3>

Mental Health and Personal Impact

- The percentage of US adults reporting symptoms of an anxiety or depressive disorder in the past seven days increased from 36.4% in August 2020 to 41.5% in February 2021, and the percentage of those reporting an unmet mental health care need increased from 9.2% to 11.7%. Increases were largest among adults aged 18–29 years and those with less than a high school education (8.0 and 7.8 percentage points, respectively).
Vahratian et al. (Mar 26, 2021). Symptoms of Anxiety or Depressive Disorder and Use of Mental Health Care Among Adults During the COVID-19 Pandemic — United States, August 2020–February 2021. MMWR. Morbidity and Mortality Weekly Report. <https://doi.org/10.15585/mmwr.mm7013e2>

Modeling and Prediction

- A study using a stochastic model to compare manual and digital contact tracing methods found that even if the probability of tracing a contact was equal by each method, manual tracing robustly performed better than digital, after accounting for intrinsic delays and limited scalability associated with manual measures. The authors note that better performance of manual tracing is enhanced by heterogeneity in individual behavior; “superspreaders” not using digital contact tracing apps are invisible to digital contact tracing, while they can be easily traced manually due to their multiple contacts.
Mancastropa et al. (Dec 26, 2021). Stochastic Sampling Effects Favor Manual over Digital Contact Tracing. Nature Communications. <https://doi.org/10.1038/s41467-021-22082-7>
- A study developing a dynamic compartmental model of SARS-CoV-2 transmission in New York, Texas, Florida, and California showed that relaxing social distancing restrictions to pre-pandemic levels without changing current face mask use would lead to new outbreaks, resulting in 0.8–4

million infections and 15,000–240,000 deaths across these four states over the next 12 months. If face mask use were reduced by 50%, a vaccine with 50% effectiveness would require coverage of 55–94% to suppress the epidemic in these states. A vaccine with 80% effectiveness would only require 32–57% coverage to suppress the epidemic.

Shen et al. (Feb 27, 2021). Projected COVID-19 Epidemic in the United States in the Context of the Effectiveness of a Potential Vaccine and Implications for Social Distancing and Face Mask Use. Vaccine. <https://doi.org/10.1016/j.vaccine.2021.02.056>

Public Health Policy and Practice

- *[Pre-print, not peer-reviewed]* In the Greater Toronto Area, Canada, SARS-CoV-2 cases defined as variant of concern (VOC) emerged faster in groups with the lowest income (growth rate 43.8%, 34.6%, and 21.6% by income tertile from lowest to highest), and the most essential work (growth rate 18.4%, 30.8%, and 50.8% by essential work tertile from lowest to highest) from February 3 to March 10, 2021. VOC cases included the N501Y mutation present in multiple SARS-CoV-2 variants; 93% of samples sequenced were the B.1.1.7 variant. The study examined data from individuals with laboratory-confirmed infection (N=22,478) and census data for neighborhood attributes. The authors note these trends are consistent with the increased burden of non-VOC COVID-19 cases, suggesting shared risk factors.

Chagla et al. (Mar 26, 2021). Characterizing the Disproportionate Burden of SARS-CoV-2 Variants of Concern among Essential Workers in the Greater Toronto Area Canada. Pre-print downloaded Mar 29 from <https://doi.org/10.1101/2021.03.22.21254127>

- *[Pre-print, not peer-reviewed]* An analysis of 553,518 cases of SARS-CoV-2 (8,853 fatal) between September 1, 2020 and March 17, 2021 in the Brazilian state of Parana found higher COVID-19 case fatality rates (CFRs) among nearly all age groups that coincided with local identification of the SARS-CoV-2 P.1 variant. All age groups showed either a decline or stabilization of CFRs through January 2021, but an increase in CFRs for almost all age groups occurred in February 2021. The CFR among those aged 20-29 years tripled (0.04% to 0.13%), while the CFR approximately doubled for those aged 30-39, 40-49, and 50-59. Individuals between 20 and 29 years who were diagnosed in February 2021 had a higher risk of death compared to those diagnosed in January 2021 (RR = 3.15), while the risk of death among those aged 30-39, 40-49, 50-59 years was 1.93-, 2.10-, and 1.80-fold higher, respectively.

Oliveira et al. (Mar 26, 2021). Sudden Rise in COVID-19 Case Fatality among Young and Middle-Aged Adults in the South of Brazil after Identification of the Novel B.1.1.28.1 (P.1) SARS-CoV-2 Strain Analysis of Data from the State of Parana. Pre-print downloaded Mar 29 from <https://doi.org/10.1101/2021.03.24.21254046>

- Among residents of Cook County, Illinois during the COVID-19 pandemic, the years of potential life lost (YPLL) was 4.8 times greater in the most affected racial/ethnic group (YPLL: 2289/100,000 population among Hispanic individuals) than in the least affected group (YPLL: 480/100,000 population among Asian individuals). 8,283 Cook County residents died from COVID-19 between March and December 2020, with Black and Hispanic residents making up 4,150 (about 50%) of the deaths.

Lilly et al. (Mar 2021). Years of Potential Life Lost Secondary to COVID-19: Cook County, Illinois. Annals of Epidemiology. <https://doi.org/10.1016/j.annepidem.2021.03.005>

Other Resources and Commentaries

- [US Public Health Neglected: Flat Or Declining Spending Left States Ill Equipped To Respond To COVID-19](#) – Health Affairs (Mar 25)
- [Factors Associated with the Intention to Obtain a COVID-19 Vaccine among a Racially/Ethnically Diverse Sample of Women in the USA](#) – Translational Behavioral Medicine (Mar 26)
- [How COVID-19 Affects the Brain](#) – JAMA Psychiatry (Mar 26)
- [Phylogenetic Analyses of SARS-CoV-2 B.1.1.7 Lineage Suggest a Single Origin Followed by Multiple Exportation Events versus Convergent Evolution](#) – Clinical Infectious Diseases (Mar 27)
- [International Attitudes on COVID-19 Vaccination Repeat National Cross-Sectional Surveys across 15 Countries](#) – MedRxiv (Mar 27)
- [How Unequal Vaccine Distribution Promotes the Evolution of Vaccine Escape](#) – MedRxiv (Mar 28)
- [Animal Reservoirs and Hosts for Emerging Alphacoronaviruses and Betacoronaviruses](#) – Emerging Infectious Diseases (Mar 18)
- [Unsanitized and Unfair: How COVID-19 Bailout Funds Refuel Inequity in the U.S. Health Care System](#) – Journal of Health Politics, Policy and Law (Mar 19)
- [What It Will Take to Vaccinate the World against COVID-19](#) – Nature (Mar 25)
- [Infliximab Is Associated with Attenuated Immunogenicity to BNT162b2 and ChAdOx1 NCoV-19 SARS-CoV-2 Vaccines](#) – MedRxiv (Mar 28)
- [COVID-19 Vaccine Access and Attitudes among People Experiencing Homelessness from Pilot Mobile Phone Survey in Los Angeles CA](#) – MedRxiv (Mar 26)
- [The Impact of School Closure and Social Isolation on Children in Vulnerable Families during COVID-19: A Focus on Children’s Reactions](#) – European Child & Adolescent Psychiatry (Mar 26)
- [The Health Effects in the US of Quarantine Policies Based on Predicted Individual Risk of Severe COVID-19 Outcomes](#) – MedRxiv (Mar 26)
- [The Emerging Plasticity of SARS-CoV-2](#) – Science (Mar 26)
- [Superspreading of SARS-CoV-2 in the USA](#) – PLOS ONE (Mar 25)
- [State Policy and Mental Health Outcomes under COVID-19](#) – Journal of Health Politics, Policy and Law (Mar 19)

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