Washington State Department of Health

2019-nCoV Literature Situation Report (Lit Rep)
April 28, 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

- **Among adults age 65 and older, the Pfizer-BioNTech and Moderna vaccines were 94% effective against hospitalization for COVID-19 among fully vaccinated individuals, and 64% effective among partially-vaccinated individuals, according to data from US hospitals during January-March 2021.** More

- **SARS-CoV-2 infection rates were 58% lower 12-20 days after receiving the first dose of the Pfizer-BioNTech vaccine among users of the COVID Symptom Study app in the UK (n=627,383), and 39% lower 12-20 days after receiving the first dose of the Oxford-AstraZeneca vaccine. Users with prior SARS-CoV-2 infection reported more frequent systemic and local side-effects following vaccination than those without known past infection. More**

Testing and Treatment

- *[Pre-print, not peer-reviewed]* A pilot program offering SARS-CoV-2 rapid antigen tests (BinaxNOW) identified three outbreaks among staff and residents of 10 participating homeless shelters in San Francisco over a period of one month. Roughly half of 828 residents and 435 staff participated per testing event, with 2.2% of participants testing positive. The implementation science analysis concluded that the point-of-care testing program could be maintained with minimal external support after the end of the pilot phase.
  Aranda-Diaz et al. (Apr 27, 2021). Implementation of Rapid and Frequent SARS-CoV2 Antigen Testing and Response in Congregate Homeless Shelters. Pre-print downloaded Apr 28 from https://doi.org/10.1101/2021.04.20.21255787

- *[Pre-print, not peer-reviewed]* A SARS-CoV-2 rapid antigen test (Standard Q) only identified 2 of 7 PCR positive patients when used as a screening tool before hospital admission for asymptomatic patients (n=116) in Switzerland, corresponding to a sensitivity of 29%. The rapid test also delivered two false positives (specificity=98.2%). Nasopharyngeal swabs for both the rapid test and PCR test were sampled simultaneously from patients.
  Caruana et al. (Apr 27, 2021). The Dark Side of SARS-CoV-2 Rapid Antigen Testing Screening Asymptomatic Patients. Pre-print downloaded Apr 28 from https://doi.org/10.1101/2021.04.24.21256040

- *[Pre-print, not peer-reviewed]* In a 1:1 randomized open-label trial among ambulatory patients with mild-moderate COVID-19 in the UK (n=292), those randomized to receive the antibiotic azithromycin had no significance difference in death or hospitalization within 28 days compared to patients receiving standard care (OR=0.91, 95% CI: 0.43-1.92). Rates of respiratory failure, progression to pneumonia, all-cause mortality, and adverse events, including serious cardiovascular events, were not significantly different between groups.
  Hinks et al. (Apr 27, 2021). A Randomised Clinical Trial of Azithromycin versus Standard Care in Ambulatory COVID-19 - the ATOMIC2 Trial. Pre-print downloaded Apr 28 from https://doi.org/10.1101/2021.04.21.21255807

Vaccines and Immunity

- *[Pre-print, not peer-reviewed]* Longitudinal assessment of immune memory response found that SARS-CoV-2 antibodies exhibited an initial rapid decline from peak levels followed by a much slower decrease ("plateau-phase"). Among 254 recovered COVID-19 patients up to 8 months after symptom onset, anti-spike IgG antibodies were estimated to have an initial half-life of 126 days up to 120 days after symptom onset, then a half-life of 238 days after 120 days from symptom onset. The authors suggest that this pattern is consistent with the generation of longer-lived antibody producing plasma cells. A similar biphasic pattern was observed with neutralizing antibodies, as the estimated half-life before and after 120 days from symptom onset was 150 days and 254 days, respectively. Of the 67 patients with data between 180-263 days after symptom onset, 48 (72%) continued to generate neutralizing antibodies. Half-life estimates of both CD4+ and CD8+ memory T cells were approximated at 200 days. CD4+ and CD8+ T cells were observed to target different SARS-CoV-2 antigens, with CD8+ responses largely targeting the nucleocapsid protein and CD4+ response equally targeting several SARS-CoV-2 proteins.
  Cohen et al. (Apr 27, 2021). Longitudinal Analysis Shows Durable and Broad Immune Memory after SARS-CoV-2 Infection with Persisting Antibody Responses and Memory B and T Cells. Pre-print downloaded Apr 28 from https://doi.org/10.1101/2021.04.19.21255739

- A cohort study in Germany determined that antibody titers were significantly lower in adults over age 80 (n=83) vaccinated with the Pfizer-BioNTech vaccine compared to vaccinated individuals under age 60 (n = 93) after one and two doses of the Pfizer-BioNTech vaccine. Most participants in both groups produced IgG antibodies. The magnitude of increase of antibody levels after the second dose was higher in elderly participants, but the absolute mean titers remained lower than in the younger group. After the second vaccination, 31.3% of the older participants had no detectable neutralizing antibodies whereas only 2.2% of participants <60 had no detectable neutralizing antibodies.
  Müller et al. (Apr 27, 2021). Age-Dependent Immune Response to the Biontech/Pfizer BNT162b2 COVID-19 Vaccination. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciab381

- SARS-CoV-2 infection rates were lower in vaccinated persons, according to reports from the COVID Symptom Study app in the UK (n=627,383). Among Pfizer-BioNTech vaccine recipients, infections were lower by 58% 12-20 days and by 72% 45-59 days after the first dose compared to frequencies in unvaccinated users, and infection rates were also lower among Oxford-AstraZeneca vaccine recipients by 39% 12-20 days and 60% 21-44 days after the first dose. Individuals with prior SARS-CoV-2 infection reported experiencing systemic side-effects 1.6 times and 2.9 times more after the first dose of the Oxford-AstraZeneca and Pfizer-BioNTech

vaccines, respectively, than those without prior infection. Similarly, local side-effects were higher among individuals with prior infection. Systemic and local side-effects occurred at lower frequencies than reported in phase 3 trials.
Menni et al. (Apr 27, 2021). Vaccine Side-Effects and SARS-CoV-2 Infection after Vaccination in Users of the COVID Symptom Study App in the UK: A Prospective Observational Study. The Lancet Infectious Diseases. https://doi.org/10.1016/S1473-3099(21)00224-3

- Among patients with cancer, one dose of the Pfizer-BioNTech vaccine did not elicit a strong antibody response. In a prospective observational study, the proportion of positive anti-S IgG titers measured at 21 days after vaccination was 38% among patients with solid cancers (21/56 patients), 18% among patients with hematological cancer (8/44), and 94% (32/34) among individuals without cancer. Among participants who received a second dose 21 days later and for whom blood samples were available 2 weeks after the second dose, 95% (18/19) of patients with solid cancer, 60% (3/5) of patients with hematological cancers, and 100% of individuals without cancer were seropositive.
Monin et al. (Apr 27, 2021). Safety and Immunogenicity of One versus Two Doses of the COVID-19 Vaccine BNT162b2 for Patients with Cancer: Interim Analysis of a Prospective Observational Study. The Lancet Oncology. https://doi.org/10.1016/S1470-2045(21)00213-8

- There was no evidence for an association between facial paralysis and mRNA vaccines for SARS-CoV-2 compared to other vaccines, according to a study using World Health Organization data. Among 133,883 cases of adverse drug reactions reported with mRNA vaccines, 844 (0.6%) total facial paralysis-related events were identified, 749 of which were reported with the Pfizer-BioNTech vaccine, and 95 with the Moderna vaccine. The authors also identified 5734 (0.5%) and 2087 (0.7%) cases of facial paralysis among 1,265,182 cases of adverse drug reactions reported with other viral vaccines, and 314,980 cases reported with influenza vaccines, respectively. The authors concluded that if an association between mRNA vaccines and facial paralysis does exist, the risk is likely very low.
Renoud et al. (Apr 27, 2021). Association of Facial Paralysis With MRNA COVID-19 Vaccines. JAMA Internal Medicine. https://doi.org/10.1001/jamainternmed.2021.2219

- Among adults age 65 and older (n = 417), mRNA vaccines were 94% effective against hospitalization for COVID-19 among fully vaccinated individuals, and 64% effective among partially-vaccinated individuals, according to data from US hospitals during January-March 2021. In the study, Pfizer and Moderna vaccines were equally represented, and approximately half of participants were over the age of 75, which the authors argue provides evidence for the real-world effectiveness of these vaccines in older adults.
Tenforde et al. (Apr 28, 2021). Effectiveness of Pfizer-BioNTech and Moderna Vaccines Against COVID-19 Among Hospitalized Adults Aged =65 Years — United States, January–March 2021. MMWR. Morbidity and Mortality Weekly Report. https://doi.org/10.15585/mmwr.mm7018e1

Clinical Characteristics and Health Care Setting
- More than half (55.4%, n = 441) of patients who recovered from severe COVID-19 had persistent symptoms ("sequelae") at six months follow-up. The most common symptoms were fatigue (25.3%), sleep disorder (23.2%) and shortness of breath (20.4%). Compared to those who had been severely ill (defined as hypoxia without respiratory failure), individuals who had been

critically ill were more likely to have cough (20.5% vs 11.6%) and impaired memory (15.1% vs 8.0%). Women were also more likely to have multiple symptoms, fatigue, and sleep disorders in multivariate analyses.

Shang et al. (Apr 27, 2021). Half-year Follow-up of Patients Recovering from Severe COVID-19: Analysis of Symptoms and Their Risk Factors. Journal of Internal Medicine.
https://doi.org/10.1111/joim.13284

Public Health Policy and Practice

- A study using CDC data to examine COVID-19 mortality rates for non-Hispanic white and non-Hispanic Black populations across US states found that structural racism was associated with increased mortality in Black populations. Using a state-level index of structural racism and adjusting for age, each standard deviation increase in the racism index was associated with a 0.26 increase in the ratio of COVID-19 morality rates among Black compared to white populations. The authors note that crude death rate ratios may result in substantial underestimation of the true disparities in COVID-19 mortality, and that structural racism should be considered a root cause of the COVID-19 mortality disparity by race.
Siegel et al. (Apr 27, 2021). Actual Racial/Ethnic Disparities in COVID-19 Mortality for the Non-Hispanic Black Compared to Non-Hispanic White Population in 35 US States and Their Association with Structural Racism. Journal of Racial and Ethnic Health Disparities.
https://doi.org/10.1007/s40615-021-01028-1

Other Resources and Commentaries

- Comparisons of the Immunological Landscape between COVID-19, Influenza, and Respiratory Syncytial Virus Patients by Clustering Analysis – Computational and Structural Biotechnology Journal (Apr 23)
- Pharmacovigilance Analysis on Cerebrovascular Accidents and Coronavirus Disease 2019 Vaccines – MedRxiv (Apr 27)
- Brazil Health Regulator Rejects Russia's Sputnik Vaccine – Reuters (2021)
- Dual Impacts of Coronavirus Anxiety on Mental Health in 35 Societies – Scientific Reports (Dec 26)
- SARS-CoV-2 Sequence Characteristics of COVID-19 Persistence and Reinfection – Clinical Infectious Diseases (Apr 27)
- Being Fair to Participants in Placebo-Controlled COVID-19 Vaccine Trials – Nature Medicine (Apr 26)
- Transient Reductions in HIV Clinic Attendance and Food Security during the COVID-19 Pandemic for People Living with HIV in Four African Countries – Clinical Infectious Diseases (Apr 27)
- Five Approaches to the Suppression of SARS-CoV-2 without Intensive Social Distancing – Proceedings of the Royal Society B: Biological Sciences (Apr 28)
- Reasons for Admissions to US Children's Hospitals During the COVID-19 Pandemic – JAMA (Apr 27)
- It's Complicated Characterizing the Time-Varying Relationship between Cell Phone Mobility and COVID-19 Spread in the US – MedRxiv (Apr 27)
- Relative Mutant N501Y SARS-CoV-2 Spike Protein RBD Inhibition of Anti-Spike Protein IgG and ACE-2 Binding to Spike Protein Species – BioRxiv (Apr 27)

- [The Barrier to Vaccination Is Not Vaccine Hesitancy Patterns of COVID-19 Vaccine Acceptance over the Course of the Pandemic in 23 Countries](#) – MedRxiv (Apr 27)
- [Reliability of COVID-19 Data: An Evaluation and Reflection](#) – MedRxiv (Apr 27)
- [Indicators for Risk of Airborne Transmission in Shared Indoor Environments and Their Application to COVID-19 Outbreaks](#) – MedRxiv (Apr 27)
- [Predicting Engagement in Behaviors to Reduce the Spread of COVID-19: The Roles of the Health Belief Model and Political Party Affiliation](#) – Psychology, Health & Medicine (Apr 27)
- [Safety and Immunogenicity of COVID-19 Vaccination in Patients with Non-Alcoholic Fatty Liver Disease (CHESS2101): A Multicenter Study](#) – Journal of Hepatology (Apr 24)
- [Predicting Daily COVID-19 Case Rates from SARS-CoV-2 RNA Concentrations across a Diversity of Wastewater Catchments](#) – MedRxiv (Apr 27)

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