2019-nCoV Literature Situation Report (Lit Rep)

April 7, 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

- **Antibody activity elicited by the Moderna vaccine remained high 6 months after the second dose in all participants in the initial phase 1 trial.** More
- **Among 20 women who had received the Pfizer vaccine during pregnancy, both women and their infants had detectable anti S- and anti-RBD-specific IgG antibodies at birth. This suggests that vaccination may provide maternal and neonatal protection.** More
- **A phylogenetic analysis of publicly available whole genome SARS-CoV-2 sequences found a minimum of 287 separate introductions of SARS-CoV-2 into Washington State both from within and outside of the US.** More
- **In a large cohort study of patients with COVID-19, Black and Hispanic patients had a higher risk of mortality than white patients, despite similar risk of hospitalization.** More

Non-Pharmaceutical Interventions

- *[Pre-print, not peer-reviewed]* The non-pharmaceutical interventions (NPIs) that had the greatest contributions to the decay ratio of SARS-CoV-2 infections in the first wave were restrictions on gatherings (27.8% contribution), use of face masks (16.8%), and school closures (10.1%), while in the second wave face masks (30%), restrictions on gatherings (17.5%), and international travel restrictions (9.2%) were most impactful. The study examined the effect of NPIs across 133 countries using publicly available data on SARS-CoV-2 infections and implementation of NPIs through March 25, 2021. The study also found that vaccinations have gradually contributed to reduced SARS-CoV-2 transmission, from 0.71% and 0.86% within 15 days and 30 days since Day 12 after vaccination, to 1.23% as of March 25th.
  Ge et al. (Apr 6, 2021). Effects of Worldwide Interventions and Vaccination on COVID-19 between Waves and Countries. Pre-print downloaded Apr 7 from https://doi.org/10.1101/2021.03.31.21254702

Transmission

- *[Pre-print, not peer-reviewed]* An infection probability model of SARS-CoV-2 infection risk in US universities found that in-person lectures can likely be held safely in large lecture halls that allow for social distancing (infection probability <1%), while classes in smaller rooms may not be safe.

In addition, while in-person dining may pose higher risk, meals for pick up were determined to be safe as long as universities enforced mask wearing and filtration efficacy, social distancing, and the number of students in each pick-up window of time. The authors also developed a web-based tool to quantify risk in other university settings.
Ambatipudi et al. (Apr 6, 2021). Risk Quantification for SARS-CoV-2 Infection through Airborne Transmission in University Settings. Pre-print downloaded Apr 7 from https://doi.org/10.1101/2021.03.31.21254731

- *[Pre-print, not peer-reviewed]* A cohort study of lactating individuals found that while SARS-CoV-2 RNA could be found in the breastmilk of some people with recent infection, there was no evidence that it contained infectious virus or that breastfeeding posed a risk of infection to infants. Breast milk samples from 110 individuals (65 confirmed positive, 36 with symptoms but without tests, and 9 with symptoms but a negative test) were tested by RT-PCR (285 samples) and/or viral culture (160 samples). While viral RNA was present in the milk of 7 of 110 (6%) individuals with either a confirmed infection or symptomatic illness, and in 6 of 65 (9%) of individuals with a positive test, live virus was not detected in any culture.
Krogstad et al. (Apr 7, 2021). No Evidence of Infectious SARS-CoV-2 in Human Milk Analysis of a Cohort of 110 Lactating Women. Pre-print downloaded Apr 7 from https://doi.org/10.1101/2021.04.05.21254897

- *[Pre-print, not peer-reviewed]* A phylogenetic analysis of 11,422 publicly available whole genome SARS-CoV-2 sequences found a minimum of 287 separate introductions of SARS-CoV-2 into Washington State in samples collected through September 2020. The majority of introductions into Washington came from a source within the US (61%, range 55-65%) while 39% (range 35-45%) likely came from outside the US.
Tordoff et al. (Apr 7, 2021). Phylogenetic Estimates of SARS-CoV-2 Introductions into Washington State. Pre-print downloaded Apr 7 from https://doi.org/10.1101/2021.04.05.21254924

Testing and Treatment

- An observational analysis of hospitalized US patients who were retested for SARS-CoV-2 due to high clinician concern for a potential false-negative found that 7/160 (4.4%) patients with an initial negative nasopharyngeal PCR test had a subsequent positive test within 48 hours. The authors conclude that routine retesting for SARS-CoV-2 is not indicated and should only be considered when clinical suspicion is high.
Sangal et al. (Apr 7, 2021). Real World Assessment of SARS-CoV-2 Nasopharyngeal Swab Testing in a High Burden COVID-19 Region. Infection Control & Hospital Epidemiology. https://doi.org/10.1017/ice.2021.153

- *[Pre-print, not peer-reviewed]* A case-control study that collected twice-daily self-collected samples from household contacts of individuals recently diagnosed with a SARS-CoV-2 infection found that SARS-CoV-2 RNA was first detectable in saliva samples and subsequently detectable in samples from nasal swabs. The study found that high-sensitivity tests that use saliva can detect SARS-CoV-2 infection 1.5 to 4.5 days before than low-sensitivity tests that use nasal swabs. While early in the infection low-sensitivity tests that use nasal swabs miss SARS-CoV-2-positive individuals with very high and potentially infectious viral loads in saliva.

Savela et al. (Apr 7, 2021). SARS-CoV-2 Is Detectable Using Sensitive RNA Saliva Testing Days before Viral Load Reaches Detection Range of Low-Sensitivity Nasal Swab Tests. Pre-print downloaded Apr 7 from https://doi.org/10.1101/2021.04.02.21254771

Vaccines and Immunity

- IgG responses measured 14 days after the first and second dose of the Pfizer-BioNTech vaccine among convalescent individuals (n = 12) and age- and sex-matched individuals with no prior infection (n = 54) showed that convalescent individuals showed higher absolute anti-S1/S2 IgG levels (220 ± 42 vs. 37 ± 3 AU/ml) compared to naïve vaccinees at 14 days after the first dose. IgG levels of convalescent individuals 14 days after the first dose were similar to those of individuals without prior infection after the second dose. 2% of naïve vaccine recipients and 75% of convalescent individuals showed IgG levels higher than 80 AU/ml after the first dose of vaccine, which the authors note has been shown to predict neutralizing antibody titers.
  Azzi et al. (Mar 2021). Anti-SARS-CoV-2 RBD IgG Responses in Convalescent versus Naïve BNT162b2 Vaccine Recipients. Vaccine. https://doi.org/10.1016/j.vaccine.2021.03.086

- Neutralizing antibody activity elicited by the Moderna vaccine remained high 6 months after the second dose in all 33 adults in an ongoing phase 1 trial, as measured by 3 different serologic assays. Binding antibody half-life estimates after day 43 for all the participants were 52 days when calculated via an exponential decay model (assumes a steady decay rate), and 109 days via a power-law model at day 119 (assumes decay rates decrease over time). Neutralizing antibody half-life estimates in the two models were 69 days and 173 days for pseudovirus neutralization, and 68 days and 202 days for live-virus neutralization.
  Doria-Rose et al. (Apr 6, 2021). Antibody Persistence through 6 Months after the Second Dose of MRNA-1273 Vaccine for Covid-19. New England Journal of Medicine.
  https://doi.org/10.1056/NEJMc2103916

- *[Pre-print, not peer-reviewed]* A study conducted in December 2020-January 2021, among 34,470 US users of a COVID-19-focused smartphone-based app found that 83% of respondents were accepting of the vaccine. Among users who expressed vaccine hesitancy, the majority were undecided about accepting vaccination. Vaccine hesitancy was significantly higher among females, younger people, minority and low-income communities, healthcare and essential workers, rural residents, geographical regions with higher COVID-19 burden, those who did not use protective measures, and those who did not receive COVID-19 tests.
  McCabe et al. (Apr 7, 2021). Unraveling Attributes of COVID-19 Vaccine Hesitancy in the U.S. A Large Nationwide Study. Pre-print downloaded Apr 7 from
  https://doi.org/10.1101/2021.04.05.21254918

- In a study of women who received the Pfizer (SARS-CoV-2 BNT162b2) vaccine, all 20 women and infants had detectable anti S- and anti-RBD-specific IgG. Anti-S and anti-RBD-specific IgG antibody levels in maternal sera were positively correlated to their respective concentrations in cord blood (correlation rho= 0.72; P<0.001 and correlation rho= 0.72; P <0.001, respectively) suggesting that vaccination may provide maternal and neonatal protection.
  Rottenstreich et al. (Apr 3, 2021). Efficient Maternofetal Transplacental Transfer of Anti-SARS-CoV-2 Spike Antibodies after Antenatal SARS-CoV-2 BNT162b2 MRNA Vaccination. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciab266

Clinical Characteristics and Health Care Setting

- *[Pre-print, not peer-reviewed]* Among adults hospitalized with COVID-19 (n = 21,528), after adjusting for age, sex, race, and insurance, HIV was not associated with in-hospital mortality (aOR = 1.13). HIV was also not associated with major adverse cardiac events (aOR = 0.99), severity of illness (aOR = 0.96), or length of stay (aOR = 1.03). Of the study population, 36 people living with HIV (16.4%) had in-hospital mortality compared with 3,290 (15.4%) without HIV (risk difference = 0.9%). Data were analyzed from the American Heart Association's COVID-19 Cardiovascular Disease registry.
  Durstenfeld et al. (Apr 7, 2021). Association of HIV with COVID-19 Outcomes Among Hospitalized Adults. Pre-print downloaded Apr 7 from https://doi.org/10.1101/2021.04.05.21254938

- A cohort study of 87 US health systems from December 1, 2019 to September 30, 2020 found that nearly half (41%) of patients presenting to the ED with COVID-19 were hospitalized. The study found that the risk of in-hospital mortality was higher in Black (RR=1.18) and Hispanic patients (RR=1.28) compared to white patients, while the risks of hospitalization were similar in Black (RR=0.94) and Hispanic patients (RR=0.99).
  Wiley et al. (Apr 2, 2021). Racial and Ethnic Differences and Clinical Outcomes of COVID-19 Patients Presenting to the Emergency Department. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciab290

Mental Health and Personal Impact

- Prevalence of anxiety and depression rose between April 23 and November 23, 2020 to levels six times higher than 2019 levels (50% and 44%, respectively), according to a weekly cross-sectional surveys of US adults (n = 1,483,378). Use of prescription medications, counseling services, and unmet mental health needs also rose significantly. The prevalence of probable mental health disorders was highest among respondents who were younger, had less education, were single, female, or Black or Hispanic.
  Coley and Baum. (Apr 5, 2021). Trends in Mental Health Symptoms, Service Use, and Unmet Need for Services among U.S. Adults through the First 9 Months of the COVID-19 Pandemic. Translational Behavioral Medicine. https://doi.org/10.1093/tbm/ibab030

Other Resources and Commentaries

- Secondary Bacterial Pneumonias and Bloodstream Infections in Patients Hospitalized with COVID-19 – Annals of the American Thoracic Society (Apr 6)
- Quelling Public Fears about Guillain-Barre Syndrome and COVID-19 Vaccination – Neurology (Apr 6)
- National Study of Youth Opinions on Vaccination for COVID-19 in the U.S – Journal of Adolescent Health (Apr)
- In Search of the Best Way to Identify Those Who Would Benefit Most From COVID-19 Vaccination—Who Goes First – JAMA Network Open (Apr 6)
- COVID-19 Vaccines in Tribal Communities Save Lives, Preserve Culture – American Journal of Health-System Pharmacy (Apr 3)
- Development of COVIDVax Model to Estimate the Risk of SARS-CoV-2-Related Death Among 7.6 Million US Veterans for Use in Vaccination Prioritization – JAMA Network Open (Apr)
- Detection of SARS-CoV-2 Antibodies Formed in Response to the BNT162b2 and MRNA-1237 MRNA Vaccine by Commercial Antibody Tests – MedRxiv (Apr 6)

- Diagnostic Accuracy Estimates for COVID-19 RT-PCR and Lateral Flow Immunoassay Tests with Bayesian Latent Class Models – American Journal of Epidemiology (Mar)
- Statins Are Associated with Improved 28-Day Mortality in Patients Hospitalized with SARS-CoV-2 Infection – MedRxiv (Apr 6)
- Global Short-Term Forecasting of COVID-19 Cases – Scientific Reports (Dec 6)
- Homebound by COVID19: The Benefits and Consequences of Non-Pharmaceutical Intervention Strategies – BMC Public Health (Dec 6)
- Antibody Response to SARS-CoV-2 MRNA Vaccines in Pregnant Women and Their Neonates – BioRxiv (Apr 6)
- Dementia as a Mortality Predictor among Older Adults with COVID-19: A Systematic Review and Meta-Analysis of Observational Study – Geriatric Nursing (Mar)
- Sex and Gender Differences in COVID Testing Hospital Admission Presentation and Drivers of Severe Outcomes in the DC/Maryland Region – MedRxiv (Apr 7)
- Timing Is Everything the Relationship between COVID Outcomes and the Date at Which Mask Mandates Are Relaxed – MedRxiv (Apr 6)
- 6-Month Neurological and Psychiatric Outcomes in 236 379 Survivors of COVID-19: A Retrospective Cohort Study Using Electronic Health Records – The Lancet Psychiatry (Apr 7)
- Racial Disparities in the SOFA Score Among Patients Hospitalized with COVID-19 – MedRxiv (Apr 6)
- Susceptibility of Circulating SARS-CoV-2 Variants to Neutralization – New England Journal of Medicine (Apr 6)

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