Washington State Department of Health

2019-nCoV Literature Situation Report (Lit Rep)
June 2, 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

➢ **A large-scale national survey in the United Kingdom conducted in April 2021 (n=17,611) found vaccine passports could increase hesitancy among those not fully vaccinated, particularly among males, those having a higher degree a vaccine implementation of vaccine, and individuals with lower baseline intent to initiate vaccination (including Black or Black British respondents, younger age groups, and non-English speakers). [More](#)**

➢ **Adverse events following the first dose of the Moderna vaccine were more likely among individuals with a history of COVID-19 infection in a self-reported survey of healthcare workers in England (n=974). [More](#)**

➢ **In a study of 47 women undergoing in vitro fertilization before and after receiving the Pfizer-BioNTech vaccine in Israel, no significant differences in cycle outcomes or embyro parameters were observed before or after receipt of the vaccine, suggesting that vaccination has no negative effect on fertility outcomes using assisted reproductive technology. [More](#)**

Geographic Spread

• *[Pre-print, not peer-reviewed]* Analysis of over 1 million SARS-CoV-2 genomes identified 115 non-synonymous mutations estimated to be present in >3% of global COVID-19 cases. COVID-19 cases were identified from 714 country-month combinations from 98 countries. High frequency mutations were defined as frequency changes occurring between a >15% increase and <5% decrease over 2 months, including the D614G mutation; medium frequency mutations were those present in 10% of cases in at least one given month, including the N501Y mutation present in the B.1.1.7 and B.1.351 variants. Levels of high-frequency mutations were found to correlate with international travel patterns.

> *Arevalo et al. (June 1, 2021). Analysis of SARS-CoV-2 Mutations Reveals Three Types of Temporal Dynamics and One Is Correlated with International Travels. Pre-print downloaded Jun 2 from* https://doi.org/10.1101/2021.06.01.446571

Vaccines and Immunity

• Sera collected from individuals with SARS-CoV-2 infection prior to April 2020 (n=18) neutralized pseudoviruses with the mutated spike proteins of variants of concern, including B.1.1.7, B.1.351, and B.1.1.248, with only a minor loss in neutralizing activity. Similarly, neutralizing activity among

individuals fully vaccinated with the Pfizer-BioNTech vaccine (n=5) were only reduced up to 3-fold by spike proteins possessing the E484K mutation. By contrast, neutralizing activity of the REGN10933 monoclonal antibody was abolished by B.1.351 and B.1.1.248, reducing the Regeneron monoclonal antibody cocktail neutralizing activity by 9- to 15-fold. The individuals were infected at time points prior to the emergence of variants of concern.

> *Tada et al. (June 1, 2021). Convalescent-Phase Sera and Vaccine-Elicited Antibodies Largely Maintain Neutralizing Titer against Global SARS-CoV-2 Variant Spikes. MBio. From* https://pubmed.ncbi.nlm.nih.gov/34060334/

- *[Pre-print, not peer-reviewed]* An open-label phase 1 trial in Korea for the recombinant COVID-19 DNA vaccine candidates GX-19 and GX-19N (Genexine, Inc.) (n=61) found that geometric mean titers (GMTs) of anti-SARS-CoV-2 antibodies elicited by vaccination were lower than convalescent sera (although higher than pre-vaccination sera). GX-19N-elicited T-cell responses were stronger than GX-19 and were similar in magnitude to T-cell responses from convalescent individuals. Additionally, GX-19N induced spike and nucleocapsid-specific responses containing epitopes also identified in SARS-CoV-2 variants of concern. Solicited adverse events were reported in 52% of participants, all but one of which were mild.

  > *Ahn et al. (June 1, 2021). Safety and Immunogenicity of a Recombinant DNA COVID-19 Vaccine Containing the Coding Regions of the Spike and Nucleocapsid Proteins Preliminary Results from an Open-Label Phase 1 Trial in Healthy Adults Aged 19-55 Years. Pre-print downloaded Jun 2 from* https://doi.org/10.1101/2021.05.26.21257700

- *[Pre-print, not peer-reviewed]* Anti-SARS-CoV-2 antibody binding and neutralizing activity in sera of both convalescent individuals who had recovered from infection that occurred prior to the spread of variants of concern (VOC) (n=69) and recipients of the Pfizer-BioNTech vaccine (n=50) were reduced against the B.1.1.7, B.1.351, and P.1 VOC, according to a cohort study. The largest reductions in neutralization were up to 4- to 7-fold by the B.1351 variant. While hospitalized COVID-19 patients and vaccinated individuals produced sufficient neutralizing activity against all variants, nearly 4 in 10 non-hospitalized patients did not neutralize B.1.351. Binding activity of monoclonal antibody treatments targeting the receptor binding domain were substantially reduced against B.1.351, but not against B.1.1.7.

  > *Caniels et al. (June 1, 2021). Emerging SARS-CoV-2 Variants of Concern Evade Humoral Immune Responses from Infection and Vaccination. Pre-print downloaded Jun 2 from* https://doi.org/10.1101/2021.05.26.21257441

- History of COVID-19 infection was associated with greater odds of reporting at least one moderate-to-severe adverse event symptom following the first dose of the Moderna vaccine (56% vs 47%, OR=1.5), according to an analysis of data from a self-reported electronic survey of healthcare workers in England (n=974; 27% with PCR- or serology-confirmed infection). After adjusting for age and sex, prior infection was significantly associated with higher numbers of symptoms and symptom severity. Number of symptoms and symptom duration was similar among those who reported having Long-COVID (n=30); no individual symptom was significantly associated with this condition.

  > *Raw et al. (May 29, 2021). Previous COVID-19 Infection, but Not Long-COVID, Is Associated with Increased Adverse Events Following BNT162b2/Pfizer Vaccination. Journal of Infection.* https://doi.org/10.1016/j.jinf.2021.05.035

- *[Pre-print, not peer-reviewed]* A study of 47 women undergoing in vitro fertilization (IVF) in Israel found no significant differences in IVF cycle outcomes in all participants prior to and after receiving the Pfizer-BioNTech vaccine, suggesting that vaccination has no negative effect on fertility using assisted reproductive technology. No significant differences were observed in the number of oocytes received, number of mature oocytes, and fertilization rate when comparing individual woman before and after vaccination (each participant served as their own control). In addition, no significant differences in embryo parameters were observed. In a subset of participants (n=15), there were no significant differences in the number or percentage of clinical pregnancies. To account for effects of sperm on fertilization, only patients undergoing intracytoplasmic sperm injection, a process where a single sperm is injected into a mature egg, were considered.

    Safrai et al. (June 1, 2021). Stopping the Misinformation BNT16b2 COVID-19 Vaccine Has No Negative Effect on Women's Fertility. Pre-print downloaded Jun 2 from https://doi.org/10.1101/2021.05.30.21258079

Mental Health and Personal Impact

- A study using smartwatch data and self-reported questionnaires before and during the second COVID-19 lockdown in Israel found that participant mood, sport duration, social encounters, resting heart rate and number of steps all decreased prior to lockdown, whereas sleep duration increased (n=169). Greater declines in mood and number of steps were observed in younger participants aged 20-40 years compared to those aged 60-80 years, while women reported greater increases in stress and reductions in social encounters than men.

    Oved et al. (June 2, 2021). Differential Effects of COVID-19 Lockdowns on Well-Being: Interaction between Age, Gender and Chronotype. Journal of The Royal Society Interface. https://doi.org/10.1098/rsif.2021.0078

Modeling and Prediction

- *[Pre-print, not peer-reviewed]* The COVID-19 transmission model Covasim, with updated methods accounting for trajectories in immune response, SARS-CoV-2 variants, and vaccine roll-out, found that neutralizing antibodies (NAbs) correlated strongly with infection blocking. The model suggests Nabs elicited by natural infection may provide more protection than the same level of Nabs elicited by vaccines; however, vaccines typically elicited higher neutralization levels. The number of SARS-CoV-2 infections, symptomatic cases, and severe cases declined rapidly with increasing vaccination coverage, but transmission may persist if the B.1.351 variant is already circulating even under high levels of coverage given its capacity to escape neutralization.

    Cohen et al. (June 1, 2021). Mechanistic Modeling of SARS-CoV-2 Immune Memory Variants and Vaccines. Pre-print downloaded Jun 2 from https://doi.org/10.1101/2021.05.31.21258018

Public Health Policy and Practice

- *[Pre-print, not peer-reviewed]* Introduction of vaccine passports could increase vaccination hesitancy among those who have not yet had two doses of a COVID-19 vaccine, according to a large-scale national survey in the United Kingdom conducted in April 2021 (n=17,611). After adjusting for baseline vaccination intent, negative impacts of vaccine passports were reported to be more substantial if passports were required for domestic travel, particularly among males and those with at least an undergraduate degree. Change in intent to vaccinate if passports were introduced was

strongly associated with baseline intent. If passports were implemented, change in vaccination inclination would be lower among Black or Black British respondents, younger age groups, and non-English speakers.

> *Figueiredo et al. (June 1, 2021). The Potential Impact of Vaccine Passports on Inclination to Accept COVID-19 Vaccinations in the United Kingdom Evidence from a Large Cross-Sectional Survey and Modelling Study. Pre-print downloaded Jun 2 from* https://doi.org/10.1101/2021.05.31.21258122

- The average years of potential life lost due to the COVID-19 pandemic was 12.72 and 15.13 years in New York State and New York City, respectively, according to an analysis of state and local health department data from February 2020 to March 2021 and Social Security administrative data on life expectancies. Corresponding economic burden due to years of life lost based on the value of a statistical life year ($240,676) was $120- and $90-billion for New York State and New York City, respectively. Economic burden was highest in Queens and Brooklyn.

> *Lui et al. (June 1, 2021). Economic Burden of Lives Lost Due to COVID-19 in New York State. Journal of Comparative Effectiveness Research.* https://doi.org/10.2217/cer-2021-0086

- *[Pre-print, not peer-reviewed]* In-person care at facilities managed by the Veterans Health Administration (VA) declined from 63% of all visits prior to the COVID-19 pandemic to just 33% during the pandemic, according to an analysis of all encounters paid for or provided by the VA between January 2019 and February 2021. However, total visits of all types (in-person and virtual) only declined by 3.5% (from 4.9 to 4.2 million) as VA encounters shifted largely to virtual care. Similarly, the VA shifted to purchasing care from non-VA providers, with community provided visits exceeded pre-pandemic levels by 26% (increase from 2.3 to 2.9 million).

> *Rose et al. (June 1, 2021). The COVID-19 Pandemic Shifted the Veterans Affairs System toward Being a Payer and Virtual Care Provider Is It Sustainable. Pre-print downloaded Jun 2 from* https://doi.org/10.1101/2021.05.31.21258031

- Hospitalization rates for heart attack declined up to 41% during the COVID-19 surge in Spring 2020 (2.82 to 1.66 cases per 100,000 person-weeks) but subsequently returned to 2019 rates, according to an analysis of weekly hospitalization rates of persons presenting to Kaiser Permanente Northern California (KPNC) between January 2020 to January 2021. Heart attack was defined as an acute ST-elevation myocardial infarction in combination with cardiac biomarkers. Weekly rates of stroke alerts (hospitalization for stroke in combination with a pre-defined pathway of immediate neurologic consultation and neuroimaging) followed a similar pattern of decline during the spring. Despite larger increases in COVID-19 hospitalizations during the same time, no significant declines in heart attack hospitalization rates were observed during the COVID-19 surges in the summer and winter of 2020-2021.

> *Solomon et al. (June 2, 2021). Changes in Patterns of Hospital Visits for Acute Myocardial Infarction or Ischemic Stroke During COVID-19 Surges. JAMA.* https://doi.org/10.1001/jama.2021.8414

Other Resources and Commentaries

- [The Combined Effect of Vaccination and Nonpharmaceutical Public Health Interventions—Ending the COVID-19 Pandemic](#) – JAMA Network Open (June 1)

- [Africa's Need for More COVID-19 Clinical Trials](#) – The Lancet (May)
- [After COVID-19 Successes, Researchers Push to Develop MRNA Vaccines for Other Diseases](#) – Nature Medicine (May 31)
- [COVID-19 Pandemic: A Review of the Global Lockdown and Its Far-Reaching Effects](#) – Science Progress (2021)
- [Equitable Access to Liver Transplant: Bridging the Gaps in the Social Determinants of Health](#) – Hepatology (June)
- [Cambodia Ends Controversial COVID-19 Restrictions](#) – The Lancet (May)

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

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