

## 2019-nCoV Literature Situation Report (Lit Rep)

February 4, 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 B.1.1.7 (UK) SARS-CoV-2 variant may increase the risk of death by 30%, based on an analysis of SARS-CoV-2 community test results in the UK that identified B.1.1.7-associated infections using S gene target PCR failure.** [More](#)
- **An iterative modeling study simulating the SARS-CoV-2 outbreak on the Diamond Princess cruise ship suggests that short- and long-range airborne transmission likely contributed to over half of transmissions, with fomites playing a smaller role.** [More](#)
- **A mathematical model calibrated to King County, Washington suggests that rapid vaccination (8,000 people per day) and more case-sensitive partial lockdowns are the two most influential factors that would lower COVID-19 adverse outcomes, considering a more contagious variant may become the dominant strain by summer 2021.** [More](#)

### Transmission

- An iterative modeling study simulating the SARS-CoV-2 outbreak on the Diamond Princess cruise ship suggests that airborne transmission via larger respiratory droplets and smaller aerosols likely accounted for over half of disease transmission. From 132 out of over 20,000 model iterations that fit the epidemiological progression of the outbreak within acceptability criteria, the mean estimates of contribution to transmission aboard the ship was 35% for short-range (i.e., droplets and aerosols within 3 meters), 35% for long-range (i.e., aerosols outside of close-range contact), and 30% for fomite transmission modes. The mean estimates of contribution for larger respiratory droplets and smaller aerosols were 41% and 59%, respectively. *[EDITORIAL NOTE: this article was summarized as a pre-print in this report on July 16, 2020]*  
*Azimi et al. (Jan 7, 2021). Mechanistic Transmission Modeling of COVID-19 on the Diamond Princess Cruise Ship Demonstrates the Importance of Aerosol Transmission. Proceedings of the National Academy of Sciences. <https://doi.org/10.1073/pnas.2015482118>*
- *[Pre-print, not peer reviewed]* In cohort study in England (n=633), seroprevalence for antibodies against SARS-CoV-2 was higher among healthcare workers (HCWs) than the general population (18% vs 7%). Longitudinal analysis showed that seroprevalence for all immunoglobins declined over time, from overall positivity of 17% to 7% within 3 months. Seroprevalence was similar between household contacts of HCW (n=178 contacts of 137 HCW) and the general population, but individuals who were living with a seropositive HCW were 7-times as likely to be seropositive themselves compared to those living with a non-seropositive HCW. Accounting for waning

seropositivity, the study estimates that the proportion of those living with a seropositive HCW who were themselves seropositive could have been as high as 44% at the height of the first wave.

*Craxford et al. (Feb 3, 2021). SARS-CoV-2 Transmission from the Healthcare Setting into the Home a Prospective Longitudinal Cohort Study. Pre-print downloaded Feb 4 from <https://doi.org/10.1101/2021.02.01.21250950>*

## Testing and Treatment

- The DETECTR assay (a combination of RT-LAMP and RT-Cas12-RNP) was found to have similar sensitivity but superior specificity to detect SARS-CoV-2 when compared to qRT-PCR on 378 patient samples derived from routine testing. Since the DETECTR assay is not as susceptible to false negatives from N-gene mutations and not as resource intensive to perform, the authors suggest the assay could complement qRT-PCR to increase testing capacity and improve specificity.

*Brandsma et al. (Oct 10, 2020). Rapid, Sensitive, and Specific Severe Acute Respiratory Syndrome Coronavirus 2 Detection: A Multicenter Comparison Between Standard Quantitative Reverse-Transcriptase Polymerase Chain Reaction and CRISPR-Based DETECTR. The Journal of Infectious Diseases. <https://doi.org/10.1093/infdis/jiaa641>*

## Vaccines and Immunity

- Neutralizing antibody titers against SARS-CoV-2 declined by an average of 4-fold after 4 months post-symptom onset in a cohort of 32 individuals recovering from SARS-CoV-2 infection. The authors conclude that the dynamics of the antibody response to SARS-CoV-2 in the first several months after infection are consistent with what would be expected based on knowledge of other acute viral infections.

*Crawford et al. (Sept 30, 2020). Dynamics of Neutralizing Antibody Titers in the Months After Severe Acute Respiratory Syndrome Coronavirus 2 Infection. The Journal of Infectious Diseases. <https://doi.org/10.1093/infdis/jiaa618>*

- An age-stratified mathematical model parameterized with a population with an age distribution based on Washington State suggests that vaccines that are at least 50% effective in preventing SARS-CoV-2 infection could be sufficient to substantially reduce infections and deaths and mitigate the pandemic, assuming roughly 70% vaccination coverage. For low vaccine effectiveness, vaccine allocation to high-risk and older age groups first would optimally minimize deaths, regardless of vaccination coverage. In contrast, vaccines with higher effectiveness would optimally minimize deaths if allocated to high-transmission age groups. [EDITORIAL NOTE: this article was summarized as a pre-print in this report on August 17, 2020]

*Matrajt et al. (Feb 3, 2020). Vaccine Optimization for COVID-19: Who to Vaccinate First? Science Advances. <https://doi.org/10.1126/sciadv.abf1374>*

- [Pre-print, not peer reviewed] The SARS-CoV-2 B.1.1.7 variant (first identified in the UK) was shown to reduce neutralizing activity of monoclonal antibodies (mAbs) targeting subdominant epitopes in the SARS-CoV-2 spike protein. In particular, the B.1.1.7 (UK) variant reduced neutralizing activity of mAbs specific to the N-terminal domain (NTD) by up to 16-fold. NTD-specific mAbs consisted of roughly a third of mAbs isolated from three convalescent donors and only 29% of NTD-specific mAbs showed neutralizing activity. In contrast, only small reductions in neutralization by mAbs specific to the dominant epitope receptor-binding domain (RBD) were observed.

Muir et al. (Feb 3, 2021). *Impact of the B.1.1.7 Variant on Neutralizing Monoclonal Antibodies Recognizing Diverse Epitopes on SARS-CoV-2 Spike*. Pre-print downloaded Feb 4 from <https://doi.org/10.1101/2021.02.03.429355>

- [Pre-print, not peer reviewed] An immuno-epidemiological model suggests that a one-dose vaccination strategy would likely decrease SARS-CoV-2 infections, but only in the short term. Long-term outcomes, as well as likelihood of viral evolution driven by partial immunity, are mainly driven by relative immune robustness of one versus two doses.

Saad-Roy et al. (Feb 3, 2021). *Epidemiological and Evolutionary Considerations of SARS-CoV-2 Vaccine Dosing Regimes*. Pre-print downloaded Feb 4 from <https://doi.org/10.1101/2021.02.01.21250944>

- In a randomized, double-blind, placebo-controlled phase 1/2 trial of the inactivated SARS-CoV-2 vaccine CoronaVac conducted among healthy, seronegative adults aged  $\geq 60$  years (n=421), all adverse reactions were mild or moderate, with injection site pain as the most frequently reported reaction (9%). Seroconversion after two doses was reported in at least 90% of all dosage groups and none in the placebo groups.

Wu et al. (Feb 3, 2021). *Safety, Tolerability, and Immunogenicity of an Inactivated SARS-CoV-2 Vaccine (CoronaVac) in Healthy Adults Aged 60 Years and Older: A Randomised, Double-Blind, Placebo-Controlled, Phase 1/2 Clinical Trial*. *The Lancet Infectious Diseases*. [https://www.thelancet.com/article/S1473-3099\(20\)30843-4/fulltext](https://www.thelancet.com/article/S1473-3099(20)30843-4/fulltext)

### Clinical Characteristics and Health Care Setting

- [Pre-print, not peer reviewed] The SARS-CoV-2 B.1.1.7 variant (first identified in the UK) was estimated to increase the risk of death by 30%, based on an analysis of a database of SARS-CoV-2 community test results in the UK. This dataset represents approximately 47% of all SARS-CoV-2 community tests and 7% of COVID-19 deaths in England from September 1, 2020 to January 22, 2021. The authors identified B.1.1.7-associated infections using S gene target PCR failure.

Davies et al. (Feb 3, 2021). *Increased Hazard of Death in Community-Tested Cases of SARS-CoV-2 Variant of Concern 20201201*. Pre-print downloaded Feb 4 from <https://doi.org/10.1101/2021.02.01.21250959>

- COVID-19 related outcomes were worse among persons living with diagnosed HIV than those without HIV in New York State between March to June 2020, according to population-level comparisons using matched data from HIV surveillance, COVID-19 laboratory-confirmed diagnoses, and hospitalization databases. Though persons living with and without diagnosed HIV had similar COVID-19 diagnosis rates, among persons diagnosed with COVID-19, those living with diagnosed HIV were 1.5-times as likely to be hospitalized and 1.3-times as likely to die. Among persons living with diagnosed HIV (n=2,988), individuals who identified as Black and Hispanic were 1.6- and 2.1-times as likely to receive a COVID-19 diagnosis than white individuals, but risk of hospitalization and death were similar once diagnosed. Relative to HIV stage 1, hospitalization risk increased by 1.3-fold and 1.7-fold with disease progression to stage 2 and stage 3.

Tesoriero et al. (Feb 1, 2021). *COVID-19 Outcomes Among Persons Living With or Without Diagnosed HIV Infection in New York State*. *JAMA Network Open*. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2775827>

## Modeling and Prediction

- A mathematical model calibrated to King County, Washington (but generalizable across states) suggests that across all scenarios of varying vaccine efficacy, rapid vaccination (roughly 8,000 people per day) and lower case thresholds for triggering and relaxing partial lockdown are the two most critical variables that predict lower total numbers of COVID-19 infections, hospitalizations, and deaths. Across all scenarios, a more contagious variant will likely dominate by early summer, with longer delays in resurgence in regions with relatively higher current seroprevalence.

*Reeves et al. (Feb 3, 2021). Rapid Vaccination and Early Reactive Partial Lockdown Will Minimize Deaths from Emerging Highly Contagious SARS-CoV-2 Variants. Pre-print downloaded Feb 4 from <https://doi.org/10.1101/2021.02.02.21250985>*

## Public Health Policy and Practice

- The median proportion of US emergency department (ED) visits that were related to mental health conditions, suicide attempts, all drug and opioid overdoses, and suspected child abuse and neglect (SCAN) were significantly higher from mid-March to October 2020 compared to the same period in 2019, based on a cross-sectional study of nearly 190 million visits using data from the CDC's National Syndromic Surveillance Program. In contrast, the proportion of visits due to intimate partner violence (IPV) was similar in the 2019 and 2020 time periods. Median visit counts for suicide attempts, all drug and opioid overdoses, IPV, and SCAN were significantly higher in the 2020 than 2019 time periods.

*Holland et al. (Feb 3, 2021). Trends in US Emergency Department Visits for Mental Health, Overdose, and Violence Outcomes Before and During the COVID-19 Pandemic. JAMA Psychiatry. <https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2775991>*

## Other Resources and Commentaries

- [Scientists' Opinion Attitudes and Consensus towards Immunity Passports](#) – MedRxiv (Feb 3)
- [Why Aren't Covid-19 Vaccines Being Manufactured in Standard Prefilled Syringes?](#) – BMJ (Feb 3)
- [Development and Deployment of COVID-19 Vaccines for Those Most Vulnerable](#) – Science Translational Medicine (Feb 3)
- [Necessity of 2 Doses of the Pfizer and Moderna COVID-19 Vaccines](#) – JAMA (Feb 3)
- [Covid-19: Four in 10 People with Evidence of Past Infection Had No Classic Symptoms, Study Finds](#) – BMJ (Feb 3)
- [The COVID-19 Athlete Passport: A Tool for Managing Athlete COVID-19 Status Surrounding the Tokyo 2020 Olympic Games](#) – The Physician and Sportsmedicine (Feb 3)
- [The Impact of the SARS-CoV-2 Pandemic on HIV and Bacterial Sexually Transmitted Infection Testing and Diagnosis in Oregon](#) – Sexually Transmitted Diseases (Feb 1)
- [SARS-CoV-2 Infects and Replicates in Cells of the Human Endocrine and Exocrine Pancreas](#) – Nature Metabolism (Feb 3)
- [Audio Interview: Covid-19 and the States - A Conversation with Ralph Northam](#) – The New England Journal of Medicine (Feb 4)
- [The Strategies to Support the COVID-19 Vaccination with Evidence-Based Communication and Tackling Misinformation](#) – Vaccines (Feb 1)
- [HIV Pre-Exposure Prophylaxis in the Time of COVID-19: How a Robust and Responsive HIV PrEP Intervention Can Avert Loss of HIV Prevention Coverage during a Global Pandemic](#) – Journal of Acquired Immune Deficiency Syndromes (1999) (Jan 29)

- [Pragmatic Recommendations for Tracheostomy, Discharge, and Rehabilitation Measures in Hospitalized Patients Recovering From Severe COVID-19 in Low- and Middle-Income Countries](#) – The American Journal of Tropical Medicine and Hygiene (Jan 13)
- [Critical Considerations for COVID-19 Vaccination of Refugees, Immigrants, and Migrants](#) – The American Journal of Tropical Medicine and Hygiene (Jan 13)
- [From Paternalism to Engagement: Bioethics Needs a Paradigm Shift to Address Racial Injustice During COVID-19](#) – The American Journal of Bioethics (Feb 1)
- [Covid-19: New Data on Oxford AstraZeneca Vaccine Backs 12 Week Dosing Interval](#) – BMJ (Clinical Research Ed.) (Feb 3)
- [Radar Continuously Tracking and Filtering SARS-CoV-2 Mutations for Molecular Surveillance](#) – BioRxiv (Feb 3)

*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*