2019-nCoV Literature Situation Report (Lit Rep)

May 19, 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

- **COVID-19 vaccination coverage among US adults aged 18-64 years was lower in rural (39%) than urban (46%) counties as of April 10, 2021 according to CDC data. Among 46 health jurisdictions where urban-rural comparisons could be assessed, only 5 had higher coverage in rural counties and another 5 had similar coverage (within 1%). Disparities persisted across age and sex. More**
- **The frequency of adverse maternal or neonatal outcomes was the same (5%) among pregnant women who received a COVID-19 vaccine during pregnancy and those who were unvaccinated (n=2,002). SARS-CoV-2 infection was significantly less common in vaccinated pregnant patients (1% vs 11%). More**
- **1 or 2 doses of the Pfizer-BioNTech vaccine or 1 dose of the Oxford-AstraZeneca vaccine were associated with an additional 44%-69% reduction in risk of death following COVID-19 in analysis of 48,096 cases among adults aged ≥70 years with at least 28 days of follow-up in England. Reductions in risk were largely similar by age group. More**

Transmission

- A SARS-CoV-2 superspreading event in a fitness center in Hong Kong that resulted in 102 cases likely occurred due to lack of mask wearing during exercise and poor ventilation. The outbreak was detected following investigation of a fitness trainer who worked at the facility who tested positive in a voluntary screening program. 45% of cases were asymptomatic, which is notably higher than that of all confirmed cases in Hong Kong (30%). Viral sequencing of respiratory samples from 59 of the cases found that all samples genetically clustered together, confirming that the event was caused by a single virus introduction. None of the cases had received a COVID-19 vaccine prior to the outbreak. The authors note their findings highlight the risk of transmission in confined spaces with poor ventilation when masks are not worn.

  Chu et al. (May 18, 2021). SARS-CoV-2 Superspread in Fitness Center, Hong Kong, China, March 2021. Emerging Infectious Diseases. https://wwwnc.cdc.gov/eid/article/27/8/21-0833_article

Testing and Treatment

- *[Pre-print, not peer-reviewed]* The anti-inflammatory drug colchicine was not associated with reductions in 28-day mortality, duration of hospital stay, or risk of progression to invasive mechanical ventilation (IVM) or death among adults hospitalized with COVID-19 in an analysis of the

RECOVERY trial (a randomized, placebo-controlled open-label trial). In both the treatment (n=5610) and control (n=5730) groups, 28-day mortality was 28%, median duration of hospital stay was 10 days, and 25% of patients progressed to IVM or death among those not on IVM at baseline. Results were consistent across pre-specified patient subgroups of pat.

Horby et al. (May 18, 2021). Colchicine in Patients Admitted to Hospital with COVID-19 (RECOVERY) a Randomised Controlled Open-Label Platform Trial. Pre-print downloaded May 19 from https://doi.org/10.1101/2021.05.18.21257267

- In a comparison of 6 rapid antigen tests against RT-PCR for SARS-CoV-2 detection in 4,981 participants, AQ-TOP and Genechecker had the highest sensitivity (98% and 95%) and positive predictive value (96% and 95%), followed by the sensitivity of Abbott ID NOW (95%) and Cobas Liat (95%). The performance of the Atila iAMP COVID-19 test was consistently poor, with the lowest sensitivity (44%) and highest proportion of invalid reports (36%).

  Mahmoud et al. (May 17, 2021). Evaluation of Six Different Rapid Methods for Nucleic Acid Detection of SARS-COV-2 Virus. Journal of Medical Virology. https://doi.org/10.1002/jmv.27090

Vaccines and Immunity

- *[Pre-print, not peer-reviewed]* Even in the small percentage of vaccine recipients who develop symptomatic disease, vaccination with either the Pfizer-BionNTech vaccine or the Oxford-AztraZeneca vaccine conferred additional protection against death, according to analysis of data from England. Among adults aged ≥70 years with COVID-19, those vaccinated with 1 dose of the Pfizer-BioNTech vaccine, 1 dose of Oxford-AstraZeneca vaccine, and 2 doses of the Pfizer-BioNTech vaccine had a 44%, 55%, and 69% reduced risk of death, respectively, compared to unvaccinated adults according to an analysis of 48,096 cases with at least 28 days of follow-up. The protection from death conferred by vaccines is additional to conferred protection against COVID-19. Reductions in risk were similar by age group; however, care home residents had a smaller reduction in risk of death after 1 dose of the Pfizer-BioNTech vaccine compared to non-care home residents (13% vs 52%), but a larger reduction in risk of death after 1 dose of the Oxford-AstraZeneca vaccine (63% vs 48%).

  Bernal et al. (May 18, 2021). Effectiveness of BNT162b2 MRNA Vaccine and ChAdOx1 Adenovirus Vector Vaccine on Mortality Following COVID-19. Pre-print downloaded May 19 from https://doi.org/10.1101/2021.05.14.21257218

- Vaccine efficacy of 7 COVID-19 vaccines correlated well with reported vaccine-elicited neutralization titers (r=0.9), according to an analysis of phase 3 vaccine trial data. Using data from the trials and neutralization data from cohorts of convalescent patients, the authors estimated that levels of vaccine-elicited anti-SARS-CoV-2 neutralizing antibodies required for 50% protection against detectable SARS-CoV-2 infection was 20% of the mean convalescent neutralization level among patients with previous infection. Neutralization levels required for 50% protection against severe disease was only 3% of the mean convalescent level. Using modeling to estimate decay of the neutralization titer over the first 250 days after immunization, the authors predict that while vaccine-elicited neutralization levels may decline significantly over time, protection against severe disease may still largely be retained.

Khoury et al. (May 17, 2021). Neutralizing Antibody Levels Are Highly Predictive of Immune Protection from Symptomatic SARS-CoV-2 Infection. Nature Medicine. https://doi.org/10.1038/s41591-021-01377-8

- Vaccination for COVID-19 among US adults aged 18-64 years was lower in rural (39%) than urban (46%) counties as of April 10, 2021 according to administrative data reported to the CDC. Disparities persisted across age and sex. Among 46 health jurisdictions where urban-rural comparisons could be assessed, only 5 had higher coverage in rural counties and another 5 had similar coverage (within 1%).

  Murthy et al. (May 18, 2021). Disparities in COVID-19 Vaccination Coverage Between Urban and Rural Counties — United States, December 14, 2020–April 10, 2021. MMWR. Morbidity and Mortality Weekly Report. https://doi.org/10.15585/mmwr.mm7020e3

- *[Pre-print, not peer-reviewed]* The prevalence of adverse maternal or neonatal outcomes was the same among pregnant women who received a COVID-19 vaccine during pregnancy and unvaccinated pregnant women (5%). Findings are based on an analysis of a delivery cohort (n=2,002) created by matching a delivery database from the Mayo Clinic with a comprehensive vaccine registry. SARS-CoV-2 infection was less common in patients vaccinated during pregnancy (n=140) than in unvaccinated patients (1% vs 11%). Tobacco or other substance use, Hispanic ethnicity, and higher gravidity were associated with a lower likelihood of vaccination.

  Theiler et al. (May 18, 2021). Pregnancy and Birth Outcomes after SARS-CoV-2 Vaccination in Pregnancy. Pre-print downloaded May 19 from https://doi.org/10.1101/2021.05.17.21257337

Geographic Spread

- *[Pre-print, not peer-reviewed]* Genomic surveillance of SARS-CoV-2 cases identified an expanding US-specific sub-lineage of the B.1.1.7 variant. This sub-lineage is characterized with sequential acquisition of a membrane protein mutation, V20L, in November 2020 and a spike mutation, D178H, in early February 2021. The proportion of B.1.1.7 isolates in the US belonging to this sub-lineage increased from 0.15% in February to 1.8% in April 2021. The sub-lineage comprises 37% of B.1.1.7 isolates in Washington State to date and has also been detected in 30 other states. Phylogenetic analysis suggests the sub-lineage may have originated from either California or Washington, while structural analysis suggests the D178H mutation may affect neutralization capacity of antibodies targeting the N terminal domain.

  Shen et al. (May 18, 2021). Rapidly Emerging SARS-CoV-2 B.1.1.7 Sub-Lineage in the United States of America with Spike Protein D178H and Membrane Protein V70L Mutations. Pre-print downloaded May 19 from https://doi.org/10.1101/2021.05.14.21257247

Modeling and Prediction

- A SARS-CoV-2 transmission model fitted to prevalence data on anti-SARS-CoV-2 antibodies (n>15,000) collected in April 2021 from New York and matched with census data found that the burden of infection largely fell on minority populations until the herd immunity threshold was reached.

  Ma et al. (May 18, 2021). Modeling the Impact of Racial and Ethnic Disparities on COVID-19 Epidemic Dynamics. ELife. https://doi.org/10.7554/eLife.66601

Public Health Policy and Practice

- Telemedicine visits comprised 20% of total outpatient visits early in the COVID-19 pandemic (from March 18 to July 14, 2020), according to an analysis of deidentified medical claims data. Across 2,800 US counties with at least 100 Medicare Advantage enrollees, less telemedicine use (below the median) was observed in counties with a lower median income, lower population density, less broadband availability (below the median), and less pre-pandemic telemedicine use. Less telemedicine use was also associated with fewer COVID-19 cases per capita during the first 30 days of the pandemic, but this association did not persist through July 2020.

  Patel et al. (May 18, 2021). Community Factors Associated With Telemedicine Use During the COVID-19 Pandemic. JAMA Network Open. https://doi.org/10.1001/jamanetworkopen.2021.10330

Other Resources and Commentaries

- A Trial Emulation Approach for Policy Evaluations with Group-Level Longitudinal Data – Epidemiology (May 13)
- Translating Inspiration from COVID-19 Vaccine Trials to Innovations in Clinical Cancer Research – Cancer Cell (May 7)
- The Covid-19 Vaccine Patent Waiver: A Crucial Step towards a "People's Vaccine. – BMJ (May 17)
- HIV Vaccines beyond COVID-19: Merits of Trust – Journal of the International AIDS Society (May)
- Evaluating Clinical Characteristics Studies Produced Early in the Covid-19 Pandemic: A Systematic Review – PLOS ONE (May 18)
- #ESHREjc Report: Does SARS-CoV-2 Affect Male Fertility – Human Reproduction (May 17)
- The Density Paradox: Are Densely-Populated Regions More Vulnerable to Covid-19 – The International Journal of Health Planning and Management (May)
- Can Integrated Post-Exposure Vaccination against SARS-COV2 Mitigate Severe Disease – The Lancet Regional Health – Europe (June 1)
- Rapid Tests for Quantification of Infectiousness Are Urgently Required in Patients with COVID-19 – The Lancet. Microbe (May)
- Converging Public Health Crises: Substance Use during the Coronavirus Disease 2019 Pandemic – Current Opinion in Psychiatry (May)
- COVID Vaccines Can Block Variant Hitting Asia, Lab Study Finds – Nature (May 17)
- Vaccine-Escape and Fast-Growing Mutations in the United Kingdom, the United States, Singapore, Spain, India, and Other COVID-19-Devastated Countries – Genomics (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