2019-nCoV Literature Situation Report (Lit Rep)

April 29, 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

- **SARS-CoV-2 secondary attack rates were 6% in households were the index case received either the Oxford-AstraZeneca or Pfizer-BioNTech vaccines prior to infection compared to 10% in households with unvaccinated index cases. Contacts of vaccinated index cases had 38-49% lower odds of infection compared to matched contacts of unvaccinated index cases. Only 7% of the index cases had received two vaccine doses by the time of their infection.** More
- **17 patients in two clusters of SARS-CoV-2 infections in Maryland were identified with the B.1.351 variant in January 2021, with none of the cases linked to travel. Symptomatic infection occurred in two partially vaccinated patients and in one patient with confirmed prior infection more than 3 months earlier, suggesting possible reinfection.** More
- **During a SARS-CoV-2 outbreak among employees of a fruit grower in Okanogan County in Washington State (May to August 2020), cumulative incidence was higher in those living in the community (12%) than those living in temporary congregate housing (4%). Cumulative incidence was higher among employees packing and sorting fruits indoors (28%) than employees working in small groups indoors or working outdoors (6-10%).** More
- **Among 122 pregnant women who had received a least the first dose of a COVID-19 mRNA vaccine by the time of delivery, anti-SARS-CoV-2 IgG antibodies were detected in 44% of cord blood samples collected from single dose recipients, compared to 99% of samples from fully vaccinated women. Maternal IgG levels were linearly associated with cord blood IgG levels and placental transfer ratios correlated with the number of weeks since receipt of the second dose.** More

Non-Pharmaceutical Interventions

- Based on mobility data, public compliance with physical distancing mandates implemented in March 2020 was found to be initially high in 5 US states that accounted for half of all COVID-19 cases during the first wave of the pandemic. However, compliance began to decrease by mid-April 2020. Greater compliance, indicated by a higher social distancing index and lower daily encounter-density change, showed negative correlations with the daily reproduction number and daily growth rate of cases.

  Liu et al. (Apr 28, 2021). Public Compliance With Social Distancing Measures and SARS-CoV-2 Spread. Public Health Reports. https://doi.org/10.1177/00333549211011254

- A review of COVID-19 cases and outbreaks in the Alaska fishing industry found that entry quarantine and testing might have reduced introduction of the virus to seafood processing facilities and vessels. A CDC field review found that among 132 non-outbreak associated cases of SARS-CoV-2 infection in

seafood processing industry workers in Alaska from March to October 2020, 81 (61%) occurred during entry quarantine at an onshore facility. 72 (89%) of these cases were part of 12 clusters comprising up to 23 cases (median=3 cases).

- Of the 13 distinct outbreaks identified in onshore facilities or vessels, 6 outbreaks (median = 6 cases) appeared to have originated in an entry quarantine group and then spread, causing an additional 69 cases. The other 7 outbreaks of unknown origin were responsible for 470 other cases. As a result of these outbreaks, Alaskan officials revised requirements for risk mitigation in the fishing industry in November 2020, including restricting quarantine groups to ≤10 persons.

  Porter et al. (Apr 30, 2021). COVID-19 Among Workers in the Seafood Processing Industry: Implications for Prevention Measures — Alaska, March–October 2020. MMWR. https://doi.org/10.15585/mmwr.mm7017a4

Transmission

- A contact tracing investigation in January 2021 initiated after a Maryland resident was confirmed to have SARS-CoV-2 infection with the B.1.351 variant, first described in South Africa, identified two clusters comprised of 17 total patients not linked to travel. Sequencing of samples from the index case and three other patients from both clusters confirmed B.1.351 infection. Symptomatic infection occurred in two partially vaccinated patients, including the index case, and in one patient with confirmed prior infection 5 months ago (possible reinfection). Two patients were hospitalized and one died.

  Feder et al. (Apr 30, 2021). Linked Clusters of SARS-CoV-2 Variant B.1.351 — Maryland, January–February 2021. MMWR. https://doi.org/10.15585/mmwr.mm7017a5

- *[Pre-print, not peer-reviewed]* Vaccinated individuals who became infected with SARS-CoV-2 had a lower rate of secondary household transmission compared to unvaccinated index individuals. Among over 550,000 residential households in the UK between January to March 2021, the overall SARS-CoV-2 secondary attack rate was 5.7% in household where the index case had received at least one dose of the Oxford-AstraZeneca and 6.3% in households where the index case had received the Pfizer-BioNTech vaccine more than 21 days before testing positive. By contrast, the overall secondary attack rate in households with unvaccinated index cases was 10%.
- In a case-control analysis, contacts of index cases vaccinated with the Oxford-AstraZeneca vaccine had 38% lower odds of SARS-CoV-2 infection compared to matched contacts of unvaccinated index cases. Similarly, contacts of index cases vaccinated with the Pfizer-BioNTech vaccine had 49% lower odds of infection. *[EDITORIAL NOTE: Only 7% of the vaccinated index cases had received two vaccine doses by the time of their infection, and thus the risk of secondary transmission infection may be even lower in those who have had two doses. In addition, misclassification of household transmission may also occur as all cases within 2-14 days of the index case were classified as household transmission.*

  Harris et al. (Apr 28, 2021). Impact of Vaccination on Household Transmission of SARS-COV-2 in England. Pre-print downloaded Apr 29 from https://khub.net/documents/135939561/390853656/Impact+of+vaccination+on+household+transmission+of+SARS-COV-2+in+England.pdf/35bf4bb1-6ade-d3eb-a39e-9c9b25a8122a

- *[Pre-print, not peer-reviewed]* A SARS-CoV-2 transmission model that accounts for a lower probability of symptomatic infection among children (21%) than adults (70%) found that only roughly 4% of in-school child-to-child transmission would be detectable with symptom-based contact tracing, even if all symptomatic cases are detected. The authors suggest that low in-school detection rates do not necessarily indicate lack of in-school transmission, nor rule out the possibility that schools can amplify community transmission of SARS-CoV-2.

  Johnson et al. (Apr 28, 2021). Detecting In-School Transmission of SARS-CoV-2 from Case Ratios and Documented Clusters. Pre-print downloaded Apr 29 from https://doi.org/10.1101/2021.04.26.21256136

- Investigation of a large SARS-CoV-2 outbreak among employees of a fruit grower in Okanogan County in Washington State between May and August 2020 found that cumulative incidence of SARS-CoV-2 infection was higher among employees living in the community than those living in congregate temporary housing (12% vs 4%). Cumulative incidence was highest among employees packing and sorting fruit indoors (28%) and lowest among those working in small groups indoors or working outdoors, including forklift operators (10%), warehouse employees (7%), and office employees (6%). Point prevalence was 1% among all employees at a one-time screening event in August.

  Miller et al. (Apr 30, 2021). COVID-19 Outbreak Among Farmworkers — Okanogan County, Washington, May–August 2020. MMWR. https://doi.org/10.15585/mmwr.mm7017a3

Testing and Treatment

- In a comparison study of longitudinally collected samples for SARS-CoV-2 PCR testing among nursing home residents within 15 days of their first positive SARS-CoV-2 RT-PCRS result (n=17), saliva swabs (SA) and oropharyngeal swabs (OR) were PCR-positive for up to 48 days. Anterior nasal swabs (AN) were only positive for up to 33 days, but had the highest percentage of PCR-positive results (81%, 21/26) when collected within 10 days. Out of 11 samples that had viable virus by viral culture, 9 were AN samples collected within 19 days and 2 were OP samples collected within 5 days.

  Gable et al. (Apr 28, 2021). A Comparison of Less Invasive SARS-CoV-2 Diagnostic Specimens in Nursing Home Residents — Arkansas, June–August 2020. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciab310

- Complications requiring emergency department treatment from nasopharyngeal swab sampling for SARS-CoV-2 PCR tests occurred in 1.24 per 100,000 tests during a 7-month period in Helsinki University Hospital, Finland. Out of over 640,000 PCR tests performed, 8 complication-related visits were identified in patients presenting to the emergency department (4 nasal bleeds, of which half were potentially life threatening, and 4 broken swabs). All complications seem to have involved an incorrect sampling technique.

  Koskinen et al. (Apr 29, 2021). Complications of COVID-19 Nasopharyngeal Swab Test. JAMA Otolaryngology–Head & Neck Surgery. https://doi.org/10.1001/jamaoto.2021.0715

Vaccines and Immunity

- Among maternal blood samples from SARS-CoV-2 positive patients obtained after delivery (n=32), higher median anti-RBD IgG titers were significantly associated with symptomatic (vs. asymptomatic) infection but not with having a PCR-positive test more than 14 days earlier (vs. PCR-

positive test within 14 days). Paired cord blood samples also obtained after delivery show that median cord/maternal anti-RBD IgG antibody ratio was 0.81. Neutralizing antibodies were detected in 94% of maternal blood samples, but only in 25% of cord blood samples. The authors note the efficiency of transplacental antibody transfer was lower than expected.

Joseph et al. (Apr 28, 2021). Maternal Antibody Response, Neutralizing Potency, and Placental Antibody Transfer After Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) Infection. Obstetrics & Gynecology. https://doi.org/10.1097/AOG.0000000000004440

- Among 122 pregnant women who delivered on or after 35 weeks gestation and received a COVID-19 mRNA vaccine by the time of delivery (n= 55 first dose, n=67 both doses), anti-SARS-CoV-2 IgG antibodies were detected in maternal blood as early as 5 days and in cord blood as early as 16 days after the first dose. An IgG response was detected in 106 women at birth, of whom 19 also produced an IgM response. In contrast, antibody responses were not detected among 16 women who were within 4 weeks of the first vaccine dose. 44% (24 of 45) of cord blood samples from single dose recipients had detectable IgG compared to 99% (65 of 67) of samples from fully vaccinated women. Maternal IgG levels were linearly associated with cord blood IgG levels and placental transfer ratios correlated with the number of weeks since receipt of the second dose. The authors state these findings suggest timing between vaccination and birth may be important to consider for vaccination strategies for pregnant women.

  Prabhu et al. (Apr 28, 2021). Antibody Response to Coronavirus Disease 2019 (COVID-19) Messenger RNA Vaccination in Pregnant Women and Transplacental Passage Into Cord Blood. Obstetrics & Gynecology. https://doi.org/10.1097/AOG.0000000000004438

- 5 cases of prothrombotic immune thrombocytopenia were identified in Germany at 5 to 11 days after receiving the first dose of the Oxford-AstraZeneca vaccine. Clinical manifestations included cerebral venous sinus thrombosis, splanchnic vein thrombosis, arterial cerebral thromboembolism, and thrombotic microangiopathy. Anti-PF4/polyanion antibodies were detected in all patients. After anticoagulation alone or in combination with eculizumab or intravenous immunoglobulin, thromboembolic events resolved in three patients but persisted in two patients.

  Tiede et al. (Apr 28, 2021). Prothrombotic Immune Thrombocytopenia after COVID-19 Vaccine. Blood. https://doi.org/10.1182/blood.2021011958

Modeling and Prediction

- A SARS-CoV-2 transmission model calibrated to a university population with 50% asymptomatic infections suggests that temporal viral load dynamics, which account for viral loads below detectable levels prior to symptom onset, could result in false negative rates of 17-48%. The authors suggest that models that do not account for the effect of this undetectable period on test performance may be recommending less testing than is necessary to stop transmission.

  Jarvis and Kelley. (Apr 28, 2021). Temporal Dynamics of Viral Load and False Negative Rate Influence the Levels of Testing Necessary to Combat COVID-19 Spread. Scientific Reports. https://doi.org/10.1038/s41598-021-88498-9

Public Health Policy and Practice

- SARS-CoV-2 infection in pregnancy (from conception to 1 week after birth) was significantly associated with a 1.4-fold higher risk of any neonatal respiratory disorder after matching for

maternal characteristics in a nationwide cohort study in Sweden (n=88,159 infants). Admission for neonatal care, respiratory distress syndrome, and hyperbilirubinemia were also associated with maternal SARS-CoV-2 test positivity. In contrast, neonatal mortality, breastfeeding rates at discharge, and length of stay in neonatal care were not associated with maternal positivity. 1.6% of infants (n=2,323) were delivered by SARS-CoV-2 positive mothers, of which 21 (0.9%) tested positive.

Norman et al. (Apr 29, 2021). Association of Maternal SARS-CoV-2 Infection in Pregnancy With Neonatal Outcomes. JAMA. https://doi.org/10.1001/jama.2021.5775

Other Resources and Commentaries

- Common Themes in Early State Policy Responses to Substance Use Disorder Treatment during COVID-19 – The American Journal of Drug and Alcohol Abuse (Apr 28)
- Black Adolescent Experiences with COVID-19 and Mental Health Services Utilization – Journal of Racial and Ethnic Health Disparities (Apr 28)
- Vaccination plus Decarceration — Stopping Covid-19 in Jails and Prisons – New England Journal of Medicine (Apr 29)
- Documentation of Do-Not-Attempt-Cardiopulmonary-Resuscitation Orders amid the COVID-19 Pandemic – Age and Ageing (Apr 28)
- Understanding Risk for Newborns Born to SARS-CoV-2–Positive Mothers – JAMA (Apr 29)
- Covid-19: US Will Send 60 Million AstraZeneca Doses Abroad as Domestic Demand Falls – BMJ (Apr 28)
- Associations between Body-Mass Index and COVID-19 Severity in 6·9 Million People in England: A Prospective, Community-Based, Cohort Study – The Lancet Diabetes & Endocrinology (Apr 28)
- Beyond the First Dose — Covid-19 Vaccine Follow-through and Continued Protective Measures – New England Journal of Medicine (Apr 28)
- Trust in Health Information Sources and Its Associations with COVID-19 Disruptions to Social Relationships and Health Services among People Living with HIV – BMC Public Health (Apr 28)
- Choices in a Crisis — Individual Preferences among SARS-CoV-2 Vaccines – New England Journal of Medicine (Apr 29)
- Farmer and Farm Worker Illnesses and Deaths from COVID-19 and Impacts on Agricultural Output – PLOS ONE (Apr 28)
- What Neurological and Psychiatric Effects Does COVID-19 Have on Its Survivors – BMC Medicine (Apr 29)
- Pharmacological Predictors of Morbidity and Mortality in COVID-19 – The Journal of Clinical Pharmacology (Apr 28)
- Antihypertensive Medications and COVID-19 Diagnosis and Mortality: Population-based Case-Control Analysis in the United Kingdom – British Journal of Clinical Pharmacology (Apr 27)

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