2019-nCoV Literature Situation Report (Lit Rep)

November 18, 2020

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

- **Final results of the candidate SARS-COV-2 vaccine produced by Pfizer, reported in a press release and not yet peer reviewed, indicate an efficacy of 95% to prevent COVID-19 disease, with evidence that it prevents severe disease.** More
- **Seropositivity against SARS-CoV-2 was found in 45% of children in households with a parent who is a healthcare worker and who had confirmed COVID-19. Secondary cases appeared to cluster in certain households, with 95% seropositivity among children in households with at least one secondary transmission.** More
- **Residents in Italy who received influenza vaccination had lower risk of SARS-CoV-2 infection and patients ≥65 years-old who were vaccinated close to the time of the COVID-19 outbreak had lower risk of hospitalization and death.** More
- **A two dose regimen of an inactivated vaccine candidate to prevent COVID-19 produced by Sinovac ("CoronaVac") was safe and immunogenic in early phase clinical testing.** More

Transmission

- Seropositivity against SARS-CoV-2 was found in 45% of children in households with a parent who is a healthcare worker and who had confirmed COVID-19. Secondary cases appeared to cluster in certain households, with 95% seropositivity among children in households with at least one secondary transmission. In a cohort study of 44 children from 21 households with a parent who is a healthcare worker with COVID-19 from five cities in in the UK, 45% (20 of 44) of children were seropositive for SARS-CoV-2 IgG. There was evidence of clustering of the secondary transmissions in certain households, with a 95% secondary attack proportion (20 of 21) among the children in the 9 households with at least 1 secondary case compare to no evidence of transmission among the 23 children in the 12 households without a secondary case.

  Ladhani et al. (Nov 17, 2020). Secondary Attack Rate and Family Clustering of SARS-CoV-2 Infection in Children of Healthcare Workers with Confirmed COVID-19. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa1737

Testing and Treatment

- Self-collection of swabs was feasible and frequently detected respiratory viruses in a community study, including early detection of circulating SARS-CoV2. Self-collection of nasal swabs (n=678) from households in Seattle (n=303) prior to the COVID-19 pandemic and during the early pandemic period

(November 2019 to April 2020) found that 35% of swabs tested positive for one or more non-influenza respiratory viruses. Four cases of SARS-CoV-2 were detected in 3 households. Collection and processing of the swabs did not require direct contact between participants and study personnel. The authors conclude that this study demonstrates the feasibility of home-based, longitudinal monitoring of respiratory viral illness in households, which may be an important component of surveillance for respiratory viral infections during the COVID-19 pandemic.

Emanuels et al. (Nov 17, 2020). Remote Household Observation for Non-Influenza Respiratory Viral Illness. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa1719

- Both commercial spike and nucleocapsid serologic tests have approximately equivalent sensitivity for clinical diagnosis after PCR-confirmed SARS-CoV-2 infection. A study of 137 samples from 96 patients evaluating three commercial anti-SARS-CoV-2 antibody assays for the detection of COVID-19 reactive antibodies reported equivalent sensitivities (range 70.4%-85.2%) within 14 days from symptom onset to PCR-confirmed diagnosis. At 28 days following symptom onset, the sensitivity increased in all assays (range 97.5-100%). The three assays were EUROIMMUN anti-SARS-CoV-2 nucleocapsid (IgG) ELISA, Elecsys anti-SARS-CoV-2 nucleocapsid (total antibodies) assay, and LIAISON anti-SARS-CoV-2 spike proteins S1 and S2 (IgG) assay.

  Favresse et al. (Nov 17, 2020). Clinical Performances of Three Fully Automated Anti-SARS-CoV-2 Immunoassays Targeting the Nucleocapsid or Spike Proteins. Journal of Medical Virology. https://doi.org/10.1002/jmv.26669

- *[Preprint, not peer-reviewed]* Administration of a single oral dose of vitamin D3 supplementation to hospitalized patients with severe COVID-19 did not show significant effect in reducing hospital length of stay (7 days vs. 7 days, p=0.4), mortality (7% vs. 5%, p=0.6), ICU admission (16% vs. 21%; p=0.3), or mechanical ventilation requirement (7% vs 14%; p=0.1) in a multicenter, double-blind, randomized, placebo-controlled trial conducted in two centers in Brazil (n=232).

  Murai et al. (Nov 17, 2020). Effect of Vitamin D3 Supplementation vs Placebo on Hospital Length of Stay in Patients with Severe COVID-19 A Multicenter Double-Blind Randomized Controlled Trial. Pre-print downloaded Nov 18 from https://doi.org/10.1101/2020.11.16.20232397

Vaccines and Immunity

- *[Press release, not peer-reviewed]* A pre-specified analysis of the Pfrizer mRNA vaccine suggested that the vaccine was 95% efficacious and prevented severe disease, according to a company press-release. 162 cases out of 170 cases of COVID-19 disease occurred in the placebo arm, with 9 out of 10 severe cases occurring in the placebo arm. Similar efficacy was observed in participants above the age of 65.

  [Press release, not peer-reviewed]
  https://www.nytimes.com/2020/11/18/health/pfizer-covid-vaccine.html

- Influenza vaccination was associated with lower risk of COVID-19 diagnosis and hospitalization. Among 17,608 residents in Italy who tested for SARS-CoV-2 (28% positive), influenza vaccination (IV) was associated with lower risk of COVID-19 diagnosis (OR=0.9) in the overall cohort, and was associated with lower risk of COVID-19-related hospitalization (HR=0.7) and death (HR=0.7) in patients age ≥65 vaccinated close to the time of SARS-CoV-2 outbreak.

  Ragni et al. (Nov 12, 2020). Association between Exposure to Influenza Vaccination and COVID-19 Diagnosis and Outcomes. Vaccines. https://doi.org/10.3390/vaccines8040675

- An inactivated vaccine produced by Sinovac was safe and immunogenic in early phase clinical testing. In a randomized, double-blind, placebo-controlled, phase 1/2 clinical trial (n=743), healthy

adults who received two doses of a b-proprionolactione inactivated SARS-CoV2 vaccine ("CoronaVac") demonstrated high rates of seroconversion. In phase 1 (n=143), the seroconversion rate after day 28 was 83% (3 ucg "low" dose) and 79% (6 ucg "high" dose) vs. 4% (placebo). In phase 2 (n=600), the seroconversion rate was 97% (low dose) and 100% (high dose) vs. 0% (placebo) after two doses. Both the low and high dose were well tolerated, with similar incidences of systemic adverse reactions when compared to placebo. Neutralizing titers were higher after two doses in the high dose group.

Zhang et al. (Nov 18, 2020). Safety, Tolerability, and Immunogenicity of an Inactivated SARS-CoV-2 Vaccine in Healthy Adults Aged 18-59 Years: A Randomised, Double-Blind, Placebo-Controlled, Phase 1/2 Clinical Trial. The Lancet Infectious Diseases. https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30843-4/fulltext

Clinical Characteristics and Health Care Setting

- In the early phase of the COVID-19 pandemic, non-ICU healthcare workers had higher rates of SARS-CoV2 when compared to the general population. A cross-sectional study conducted in a university and two affiliated university hospitals in New Jersey found that healthcare workers had a higher rate of SARS-CoV-2 seropositivity when compared to non-healthcare workers (40/546 [7.3%] vs. 1/283 [0.4%]). Among healthcare workers, nurses had a higher likelihood evidence of infection compared physicians and those who reported recently caring for 5 or more patients with suspected or confirmed COVID-19 (vs. caring for less patients) had a higher likelihood of infection. ICU workers had lower rates than those working in other units (2% vs. 5-10%).

  Barrett et al. (Nov 16, 2020). Prevalence of SARS-CoV-2 Infection in Previously Undiagnosed Health Care Workers in New Jersey, at the Onset of the U.S. COVID-19 Pandemic. BMC Infectious Diseases. https://doi.org/10.1186/s12879-020-05587-2

- A meta-analysis of pediatric multisystem inflammation syndrome (PMIS) documented three common types of PMIS clinical presentation: persistent fever and gastrointestinal symptoms, cardiogenic shock, and Kawasaki disease-like syndrome. In 7 studies including 182 patients, only 9% of patients presented with respiratory symptoms and only 37% were positive for SARS-CoV2 by PCR, while 81% were positive for antibodies against SARS-CoV-2.

  Zou et al. (Nov 9, 2020). Characteristics of Pediatric Multi-System Inflammatory Syndrome (PMIS) Associated with COVID-19: A Meta-Analysis and Insights into Pathogenesis. International Journal of Infectious Diseases. https://doi.org/10.1016/j.ijid.2020.11.145

Public Health Policy and Practice

- Most families caring for adults with developmental disability adopted remote communication technologies to engage with their relatives. An online anonymous survey of 108 family caregivers of adults with developmental disabilities conducted during a "lockdown" (April-May 2020) was compared to responses from the month prior to lockdown. Face-to-face contact decreased from 91% to 32% and video call use increased from 28% to 64% (both $p<0.01$). While 79% of participants who used video calls rated it as helpful, they also reported that video interactions were limited in providing multifaceted social support.

  Araten-Bergman and Shpigelman. (Nov 9, 2020). Staying Connected during COVID-19: Family Engagement with Adults with Developmental Disabilities in Supported Accommodation. Research in Developmental Disabilities. https://doi.org/10.1016/j.ridd.2020.103812

- When the threat of SARS-CoV2 is presented with more active language, participants report a greater degree of anger, arguing with sources, and disbelief ("negative cognition"), whereas perception of susceptibility to SARS-CoV2 infection and severity of COVID-19 disease were unchanged. In an online

study with 207 participants recruited from Amazon MTurk, when SARS-CoV-2 was presented in a more active manner ("the virus is more likely to prey on people in the coming days") participants reported higher psychological reactance than when conveyed in a more human-centered fashion ("more people are likely to contract the virus in the coming days"). The authors acknowledge that the study cohort (mostly white, middle-class males) may not be representative of the general population and may be subject to social desirability bias.

Ma and Miller. (Nov 16, 2020). The Effects of Agency Assignment and Reference Point on Responses to COVID-19 Messages. Health Communication. https://doi.org/10.1080/10410236.2020.1848066

- In California, the lockdown in response to the COVID-19 pandemic was not associated with changes in the overall rate of pre-term birth (<37 weeks), although there was an increase in the rate of birth at less than 32 weeks. During a 4-month period following the state-wide COVID-19 lockdown in California in March, 2020, there was no significant change in the rate of birth at less than 37 weeks gestation) compared to the same 4-month period aggregated over 2016-2019 (74% vs. 73%, OR=1.0, p=0.4). The rate of preterm birth at 28-32 weeks gestation showed an 11% increase (11% vs. 6%, OR=1.1, p=0.004), mostly observed among women who identify as Hispanic or Latinx population.

  Main et al. (Oct 22, 2020). Singleton Preterm Birth Rates for Racial and Ethnic Groups during the Coronavirus Disease 2019 Pandemic in California. American Journal of Obstetrics and Gynecology. https://doi.org/10.1016/j.ajog.2020.10.033

- In a large cohort of patients hospitalized for COVID-19 in the US (n=7,868) during January-July 2020, the overall mortality was 18%, with 53% of all deaths occurring in Black and Hispanic patients. Black patients also had the highest rates of mechanical ventilation (23%) and renal replacement therapy (7%). In-hospital mortality and major cardiovascular or cerebrovascular adverse events did not differ by race/ethnicity after adjusting for sociodemographic and clinical characteristics.

  Rodriguez et al. (Nov 17, 2020). Racial and Ethnic Differences in Presentation and Outcomes for Patients Hospitalized with COVID-19: Findings from the American Heart Association's COVID-19 Cardiovascular Disease Registry. Circulation. https://doi.org/10.1161/CIRCULATIONAHA.120.052278

Other Resources and Commentaries

- Covid Counties Is an Interactive Real Time Tracker of the COVID19 Pandemic at the Level of US Counties – Scientific Data (Nov 16)
- Expecting the Unexpected with COVID-19 Vaccines – The Lancet Infectious Diseases (Nov 18)
- COVID Vaccine Excitement Builds as Moderna Reports Third Positive Result – Nature (Nov 16)
- Inadequate Minority Representation within SARS-CoV-2 Vaccine Trials – The American Journal of Tropical Medicine and Hygiene (Nov 11)
- Association Between Proportion of Workday Treating COVID-19 and Depression, Anxiety, and PTSD Outcomes in U.S. Physicians – Journal of Occupational and Environmental Medicine (Nov 16)
- Cytokine Storm May Not Be the Chief Culprit for the Deterioration of COVID-19 – Viral Immunology (Nov 17)
- The Role of Manufacturers in the Implementation of Global Traceability Standards in the Supply Chain to Combat Vaccine Counterfeiting and Enhance Safety Monitoring – Vaccine (Nov 13)
- Clinical, Regional, and Genetic Characteristics of Covid-19 Patients from UK Biobank – PLOS ONE (Nov 17)
- Partnership to Make 120 Million COVID-19 Rapid Tests Available – JAMA (Nov 17)
- What Is Driving the Decline in People's Willingness to Take the COVID-19 Vaccine in the United States? – JAMA Health Forum (Nov 18)

- Global Seasonality of Human Coronaviruses: A Systematic Review – Open Forum Infectious Diseases (Nov 1)
- Covid-19: North Dakota and Belgium Have Let Infected Health Staff Work on Wards – BMJ (Nov 16)
- Wearing a Mask Can Protect Against Coronavirus Disease 2019 for the Wearer as Well as Others, The CDC Says – JAMA Health Forum (Nov 17)
- Food Products as Potential Carriers of SARS-CoV-2 – Food Control (Nov 11)

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