2019-nCoV Literature Situation Report (Lit Rep)

August 14, 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

- **A nationally-representative study in England found broad acceptability and reliability of results from home-based self-testing for SARS-CoV-2 antibodies, but found some challenges with the usability of the evaluated kits.** More
- **French nursing homes in which staff voluntarily confined themselves to the facility had a markedly lower likelihood of COVID-19 cases and deaths among residents than facilities in which staff did not self-confine.** More
- **A national survey in the US found that 49% of parents would probably or definitely send their children to school if their school opened in the fall, while 31% probably or definitely would keep their children home. Lower income, unemployment, and job flexibility were all positively associated with plans to keep children home.** More
- **A study of close contacts of SARS-CoV-2 cases in China found an overall attack rate of 4%, with a higher rate in households than in healthcare settings or on public transportation. Secondary attack rate was positively associated with severity of the index case's disease.** More
- **A study of obstetrical patients in Boston found no evidence that the number of in-person healthcare visits was associated with risk of SARS-CoV-2 infection.** More

Non-Pharmaceutical Interventions

- Zens et al. report findings from the COVID-19 Symptom Tracker study, an app-based daily self-reporting study. Between April 8 and May 15, 22,327 individuals living in Germany installed the app, of which 11,829 (59%) completed the symptom questionnaire at least once. Of the 291 participants who received a SARS-CoV-2 PCR test, 22% were positive. Untested participants reported a mean of 0.8 symptoms compared to 5.6 symptoms among tested participants. Chills, fever, loss of smell, nausea, vomiting, and shortness of breath were the strongest predictors of SARS-CoV-2 infection. Diabetes and chronic heart disease were significant risk factors for positivity.

  Zens et al. (July 2020). App-Based Tracking of Self-Reported COVID-19 Symptoms. Journal of Medical Internet Research. https://doi.org/10.2196/21956

Schools

- A national survey in the US in early June (n=730 parents) found 31% of participants indicated they would probably or definitely keep their child home this fall if their school opened for in-person instruction, while 49% reported they would probably or definitely send their child to school. Lower income, being unemployed, and having a flexible job were associated with greater likelihood of planning to keep children home. Those who reported fear of COVID-19 or multi-system

inflammatory syndrome were more likely to plan to keep children home, while those who reported confidence in schools and challenges with homeschool were less likely to plan to keep children home. Race and ethnicity were not significantly associated with plans to keep children home.

Kroshus et al. (2020). Plans of US Parents Regarding School Attendance for Their Children in the Fall of 2020 A National Survey Editorial Supplemental Content. JAMA Pediatrics. https://doi.org/10.1001/jamapediatrics.2020.3864

Transmission

- French nursing homes in which staff voluntarily confined themselves to the facility (n=17 facilities corresponding to 794 staff and 1,250 residents) experienced COVID-19 cases in only 6% of facilities compared to 48% of facilities in which staff did not self-confine (n=9,513 facilities corresponding to 385,290 staff and 695,060 residents). Among residents in facilities with self-confinement only 0.4% had confirmed COVID-19 and none had possible COVID-19, compared with 4% and 5% among facilities without. Self-confinement of staff was associated with a 78% lower odds of death among residents. Incidence of confirmed or possible COVID-19 among staff was 1.6% with self-confinement versus 8% versus without.

  Belmin et al. (Aug 2020). Coronavirus Disease 2019 Outcomes in French Nursing Homes That Implemented Staff Confinement With Residents. JAMA Network Open. https://doi.org/10.1001/jamanetworkopen.2020.17533

- A study of SARS-CoV-2 infection among 3,410 close contacts of 391 confirmed SARS-CoV-2 cases in Guangzhou, China found a secondary attack rate of 4%. Close contact was defined as contact without effective protection starting 2 days before symptom onset or 2 days before testing for asymptomatic cases. Eight percent of index cases were asymptomatic, 16% had mild symptoms, 69% had moderate symptoms, and 9% had severe/critical illness. Secondary attack rates were highest in household settings (10%) and lower in healthcare settings (1%) and on public transportation (0.1%).
- Secondary attack rate was positively associated with index case severity, at 0.3% for asymptomatic index cases, 3% for mild cases, 6% for moderate cases, and 6% for severe or critical cases. Secondary attack rate was also far higher for index cases with a productive cough (14% versus 3%).

  Luo et al. (Aug 2020). Contact Settings and Risk for Transmission in 3410 Close Contacts of Patients With COVID-19 in Guangzhou, China: A Prospective Cohort Study. Annals of Internal Medicine. https://doi.org/10.7326/M20-2671

Geographic Spread

- US data from January 22-July 15 were analyzed to detect "hotspot" counties. No hotspots were identified prior to March 7, but 818 counties (corresponding to 80% of the US population) met hotspot criteria for one or more days between from March 8 to July 15. The number of hotspot counties peaked in early April, decreased, and then increased again in late June.

  Oster et al. (Aug 14, 2020). Trends in Number and Distribution of COVID-19 Hotspot Counties — United States, March 8–July 15, 2020. MMWR. https://doi.org/10.15585/mmwr.mm6933e2

Testing and Treatment

- A nationally-representative survey of adults in England assessed acceptability of two SARS-CoV-2 antibody home self-tests (n=10,600 and n=3,800), including pilot testing in 315 volunteers to optimize usability. Pilot testing revealed high levels of acceptability but limitations to usability, particularly use of included materials, clarity of instructions, and guidance on result interpretation.

In the main study, over 97% of participants completed their assigned tests, reporting improvements in clarity of instructions but remaining difficulties in use of the test kits. Over 90% obtained a valid result, and there was substantial concordance between participant and clinician-interpreted results.

Atchison et al. (Aug 2020). Usability and Acceptability of Home-Based Self-Testing for SARS-CoV-2 Antibodies for Population Surveillance. Clinical Infectious Diseases. https://pubmed.ncbi.nlm.nih.gov/32785665

Vaccines

- Mulligan et al. report safety, tolerability, and immunogenicity findings from an ongoing placebo-controlled observer-blinded dose escalation study among 45 healthy adults randomized to receive an anti-SARS-CoV-2 vaccine that targets the spike glycoprotein receptor-binding domain (two doses 21 days apart). Local reactions and systemic events were generally mild, dose-dependent, and transient. Exceptions included one report of severe pain for a high-dose participant, two reports of grade 3 fever, and one report of sleep disturbance. No serious adverse events were reported.
- IgG concentrations and neutralizing titers increased with dose level and after a second dose; however, the difference between medium- and high-dose after the first vaccination was not meaningful. As a result, a second high-dose vaccination was not administered. Neutralizing titers were 1.9 to 4.6 times that of a panel of COVID-19 convalescent human sera.

  Mulligan et al. (Aug 12, 2020). Phase 1/2 Study of COVID-19 RNA Vaccine BNT162b1 in Adults. Nature. https://doi.org/10.1038/s41586-020-2639-4

- Xia et al. report interim analyses of an ongoing randomized, double-blind, placebo-controlled phase 1 (n=96) and 2 (n=224) clinical trials of an inactivated whole-virus COVID-19 vaccine conducted in Henan Province, China. All participants who were randomized completed the trial up to 28 days post-vaccination. Frequency of adverse reactions increased with dose and the most common adverse reactions were injection site pain and fever, which were mild and self-limiting, with no serious adverse reactions noted. Immunogenicity was noted in all dose groups.

  Xia et al. (Aug 13, 2020). Effect of an Inactivated Vaccine Against SARS-CoV-2 on Safety and Immunogenicity Outcomes. JAMA. https://doi.org/10.1001/jama.2020.15543

Clinical Characteristics and Health Care Setting

- A nested case-control study among obstetrical patients delivering at four hospitals in Boston found that there was no meaningful difference between the number of in-person visits for case patients with SARS-CoV-2 versus controls (mean 3.3 visits versus 3.1). All patients in the study were tested for SARS-CoV-2 on admission. Cases were matched with up to 5 controls on gestational age, race/ethnicity, insurance type, and SARS-CoV-2 incidence in the patient's zip code of residence (n=2,968 deliveries). Results were adjusted for age, BMI, and essential worker occupation, with imputation for missing variables.

  Reale et al. (Aug 14, 2020). Association Between Number of In-Person Health Care Visits and SARS-CoV-2 Infection in Obstetrical Patients. JAMA. https://doi.org/10.1001/jama.2020.15242

- A review of patients with confirmed COVID-19 in Houston, Texas during the initial peak and resurgence of COVID-19 (up to July 7) found that during the resurgence, patients were younger, more likely to be Hispanic, more likely to reside in a zip code with lower median income, and less likely to have general and specific comorbidities, compared to patients in the initial peak. Patients during the resurgence were more likely to receive remdesivir and enoxaparin. The analysis included 774 patients from the initial peak and 2,130 from the resurgence period.

- ICU admission was significantly less common for patients during the resurgence (20% vs 38%), hospital stay was significantly shorter (4.8 versus 7.1 days), and in-hospital mortality was significantly lower (5% versus 12%). Morality among ICU-treated patients was unchanged.

  Vahidy et al. (Aug 2020). Characteristics and Outcomes of COVID-19 Patients During Initial Peak and Resurgence in the Houston Metropolitan Area. JAMA. https://doi.org/10.1001/jama.2020.15301

- A cross-sectional analysis of the COVID-19 Surveillance and Outcomes Registry, which captures data for a large healthcare system in the Houston area, reported a 7% test positivity. After adjustment for confounders, compared to non-Hispanic whites, test positivity was higher among non-Hispanic Black individuals (OR=2.2) and those of Hispanic ethnicity (OR=1.95). Using structural equation modeling, the authors demonstrated a significant indirect effect of race and ethnicity mediated by population density in zip code of residence.

  Vahidy et al. (Aug 11, 2020). Racial and Ethnic Disparities in SARS-CoV-2 Pandemic: Analysis of a COVID-19 Observational Registry for a Diverse US Metropolitan Population. BMJ Open. *https://doi.org/10.1136/bmjopen-2020-039849*

- A study of all adults registered with a general practice in England (n=61,414,470) found a 2.9-fold higher likelihood of in-hospital COVID-19 related death among those with for type 1 diabetes and 1.8-fold higher likelihood among those with type 2 diabetes compared to other patients, after adjustment for confounders. The unadjusted risk difference for COVID-19 related mortality was 111 per 100,000 for type 1 diabetes and 233 per 100,000 for type 2 diabetes.

  Barron et al. (Aug 2020). Associations of Type 1 and Type 2 Diabetes with COVID-19-Related Mortality in England: A Whole-Population Study. The Lancet Diabetes & Endocrinology. https://doi.org/10.1016/S2213-8587(20)30272-2

Mental Health and Personal Impact

- An analysis of patients at a Boston hospital found a 1.8-fold higher incidence of intimate partner violence during the early COVID-19 pandemic (March 11 to May 3, 2020) (n=26), compared to the same period over the past three years (n=42). The severity of abuse also increased. Abuse victims were more likely to be ethnically white (65% during 2020 versus 26% during the reference period).

  Gosangi et al. (Aug 2020). Exacerbation of Physical Intimate Partner Violence during COVID-19 Lockdown. Radiology. https://doi.org/10.1148/radiol.2020202866

Modeling and Prediction

- *[preprint, not peer-reviewed]* Kraay et al. used a transmission modeling approach to simulate fomite transmission of SARS-CoV-2 (via contaminated surfaces) under a variety of settings, surface types and cleaning frequencies. Unknown parameter values were derived from other pathogens with similar properties to SARS-CoV-2. Fomite R_0 ranged from 2 in low risk venues (offices) to 20 in high-risk settings (daycares) and was higher than that of both influenza and rhinovirus. The model indicates that hourly cleaning and disinfection alone could bring the fomite R_0 below 1 in some office settings, but not in daycares or schools. Cloth and other porous surfaces were unlikely to sustain transmission, suggesting cleaning and disinfection focus on non-porous surfaces.

  Kraay et al. (Aug 13, 2020). Risk of Fomite-Mediated Transmission of SARS-CoV-2 in Child Daycares Schools and Offices a Modeling Study. Preprint downloaded August 14 from https://doi.org/10.1101/2020.08.10.20171629

Other Resources and Commentaries

- Ten Key Points about COVID-19 in Children: The Shadows on the Wall – Pediatric Pulmonology (Aug 13)
- Incentivized Public Service Response to COVID-19 in Rural and Marginalized Urban Communities – American Journal of Public Health (Sept)
- Addressing the Disproportionate Impacts of the COVID-19 Pandemic on Sexual and Gender Minority Populations in the United States: Actions Toward Equity – LGBT Health (Aug 13)
- A Need for Open Public Data Standards and Sharing in Light of COVID-19 – The Lancet Infectious Diseases (Aug 10)
- Patient-Reported Outcomes: Central to the Management of COVID-19 – The Lancet (Aug 10)
- Covid-19 and the Mandate to Redefine Preventive Care – The New England Journal of Medicine (Aug 12)
- Treatment of COVID-19 with Convalescent Plasma: Lessons from Past Coronavirus Outbreaks – Clinical Microbiology and Infection (Aug 11)
- COVID-19 Disparities and the Black Community: A Health Equity-Informed Rapid Response Is Needed – American Journal of Public Health (Aug 12)
- What's Next for the US Health Care System After COVID-19? – American Journal of Public Health (Aug 12)
- Invited Editorial: Despite COVID-19, Influenza Must Not Be Relegated to "Only the Sniffles" – Vaccines (Aug 7)
- NCCHC Survey Yields Insights Into COVID-19 in U.S. Correctional Facilities – Journal of Correctional Health Care (Aug 13)
- Researchers Strive to Recruit Hard-Hit Minorities Into COVID-19 Vaccine Trials – JAMA (Aug 13)
- 13 States Make Contact Tracing Data Public. Here's What They're Learning – NPR (Aug 14)
- Covid-19 Misinformation Sparks Threats and Violence against Doctors in Latin America – BMJ (Aug 11)
- Impact of Policy on Children Returning to School in the Era of COVID-19 – JAMA Pediatrics (Aug 14)

Report prepared by the UW MetaCenter 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