2019-nCoV Literature Situation Report (Lit Rep)

October 22, 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

- **Only 1 to 6 cases of hospital-acquired SARS-CoV-2 infection at UW Medicine were reported from April 2 to May 14, corresponding to a relatively low incidence of 0.8 to 5 cases per 10,000 patient days.** More
- **A SARS-CoV-2 super-spreader event within Major League Baseball had an attack rate of 14.4% (21 out of 146 people exposed to the index case), but no evidence of secondary transmission during field play.** More
- **A correctional facility officer who did not meet the operational definition of close contact (being within 6 feet of infectious persons for 15 minutes or more) became infected with SARS-CoV-2 after multiple brief encounters with a cumulative exposure duration of 17 minutes from 6 infected inmates.** More
- **A randomized placebo-controlled trial (n=243) found that tocilizumab was not effective in preventing intubation or death among moderately ill and hospitalized patients with COVID-19.** More

Non-Pharmaceutical Interventions

- Pasteurization was shown to successfully inactivate SARS-CoV-2 in human breast milk. Conzelmann et al. spiked five different virus isolates from Germany, France, and the Netherlands into five individual milk samples. Incubating the milk samples at room temperature for 30 minutes resulted in a 40.9-92.8% drop in viral titers, and after pasteurization no further residual infectivity was detected in any of the samples.

  Conzelmann et al. (Oct 21, 2020). Pasteurization Inactivates SARS-CoV-2 Spiked Breast Milk. Pediatrics. https://doi.org/10.1542/peds.2020-031690

Transmission

- A population analysis of 189 care homes in Scotland between March and August found 69 (37%) had a confirmed COVID-19 outbreak, of which almost all (96%) were care homes for older people. The size of care homes for older people was strongly associated with an outbreak (OR per 20-bed increase 3.35, 95% CI 1·99–5.63). 907 confirmed cases and 432 COVID-19-related deaths were recorded during the study period, with a quarter of both cases and deaths occurring in only 3% of

the care homes. 74 excess deaths were reported among care homes experiencing an outbreak compared to 10 excess deaths in care homes that did not.

Burton et al. (Oct 20, 2020). Evolution and Effects of COVID-19 Outbreaks in Care Homes: A Population Analysis in 189 Care Homes in One Geographical Region of the UK. The Lancet Healthy Longevity. https://doi.org/10.1016/S2666-7568(20)30012-X

- An airborne SARS-CoV-2 transmission infection risk model for 12 New York City nail salons found the average transmission risk when not wearing face masks was 25% vs 7% when masks were worn. Utilizing previous estimates of outdoor airflow rates, increased outdoor airflow rates in the model strongly correlated with decreased risk, suggesting that businesses should employ multiple layers of infection control measures (e.g. social distancing, face masks, and outdoor airflow).

  Harrichandra et al. (Oct 21, 2020). An Estimation of Airborne SARS-CoV-2 Infection Transmission Risk in New York City Nail Salons. Toxicology and Industrial Health. https://doi.org/10.1177/0748233720964650

- An outbreak investigation of players and employees from three Major League Baseball teams did not find any secondary transmission from cases on the index team during field play over 11 hours and 8 minutes with 2 opposing teams. The outbreak had a 14.4% total attack rate (21 of 146 total exposed) from the index patient from Team A. A genomic analysis of 18 of 20 residual samples revealed the cases were consistent with a super-spreader event. Interactions outside of game play were the likely source of transmission within the affected team. Among 19 of 21 persons diagnosed with COVID-19, symptoms developed an average of 2.3 days after testing positive.

  Murray et al. (Oct 23, 2020). Mitigating a COVID-19 Outbreak Among Major League Baseball Players — United States, 2020. MMWR. Morbidity and Mortality Weekly Report. https://www.cdc.gov/mmwr/volumes/69/wr/mm6942a4.htm?s_cid=mm6942a4_x

- A correctional facility officer in Vermont contracted SARS-CoV-2 after multiple brief encounters with 6 SARS-CoV-2 positive incarcerated or detained persons (IDPs) for a cumulative duration of 17 minutes. However, he did not meet the operational definition of a "close contact" in contact tracing investigations, which is being within 6 feet of infectious persons for 15 minutes or more. The officer wore a microfiber cloth mask, gown, and eye protection during all interactions with IDPs, while the IDPs only wore PPE during some interactions.

  Pringle et al. (Oct 21, 2020). COVID-19 in a Correctional Facility Employee Following Multiple Brief Exposures to Persons with COVID-19 — Vermont, July–August 2020. MMWR. Morbidity and Mortality Weekly Report. https://doi.org/10.15585/mmwr.mm6943e1

Testing and Treatment

- Results from a randomized placebo-controlled trial in Iran (n=59) suggest that administration of intravenous immunoglobin (IVIG) could reduce in-hospital mortality rates due to severe COVID-19. Mortality was 20% in the IVIG group (6 of 30) vs 48.3% (14 of 29) in the placebo group. Multivariate analysis showed that IVIG was associated with a reduced in-hospital mortality rate (adjusted OR = 0.003, 95% CI = 0.001-0.815).

Gharebaghi et al. (Oct 21, 2020). The Use of Intravenous Immunoglobulin Gamma for the Treatment of Severe Coronavirus Disease 2019: A Randomized Placebo-Controlled Double-Blind Clinical Trial. BMC Infectious Diseases. https://doi.org/10.1186/s12879-020-05507-4

- A randomized, placebo-controlled trial (n=243) demonstrated that tocilizumab (TCZ) was not effective in preventing intubation or death among moderately ill and hospitalized COVID-19 patients. At 28 days, the primary outcome of intubation or death was observed in 17 patients (10.6%) in the TCZ group and 10 patients (12.5%) in the placebo group (HR = 0.83, 95% CI = 0.38-1.81). Similar percentages of patients in the two groups received remdesivir, hydroxychloroquine, or glucocorticoids. Fewer serious infections were observed in the TCZ group (8.1% vs 17.3%, p=0.03).

  Stone et al. (Oct 21, 2020). Efficacy of Tocilizumab in Patients Hospitalized with Covid-19. New England Journal of Medicine. https://doi.org/10.1056/NEJMoa2028836

- Odds of mortality were reduced in half among participants taking angiotensin-converting enzyme inhibitors or angiotensin receptor blockers (95% CI = 0.3-0.7) in a retrospective cohort study (n=2,553) after adjusting for underlying conditions, length of stay, age, gender, and ICU admission. A notable confounder was the higher mortality frequency in patients with a history of underlying disease (22.4% vs 12.7%).

  Yahyavi et al. (Oct 21, 2020). Angiotensin Enzyme Inhibitors and Angiotensin Receptor Blockers as Protective Factors in COVID-19 Mortality: A Retrospective Cohort Study. Internal and Emergency Medicine. https://doi.org/10.1007/s11739-020-02523-9

Clinical Characteristics and Health Care Setting

- Eight cases of possible incident SARS-CoV-2 were observed during hospitalization or within 14 days post-discharge among 2,992 patients who tested negative on admission to UW Medicine (Washington) hospitals between April 2 and May 14. Further review determined 1 to 6 cases as potential hospital-acquired infections, corresponding to a relatively low incidence of 0.8 to 5 cases per 10,000 patient-days.

  Long et al. (Sept 14, 2020). Incidence of Health Care–Associated COVID-19 During Universal Testing of Medical and Surgical Admissions in a Large US Health System. Open Forum Infectious Diseases. https://doi.org/10.1093/ofid/ofaa435

Mental Health and Personal Impact

- In-depth interviews from US immigrant survivors of intimate partner violence (IPV) identified stress due to social and economic disruption and increased frequency and severity of IPV. Service providers who participated in in-depth interviews suggest adapting strategies such as strengthening virtual platforms, conducting safe telephone check-ins and text messages, and providing safe virtual and tailored safety planning.

  Sabri et al. (Oct 21, 2020). Effect of COVID-19 Pandemic on Women's Health and Safety: A Study of Immigrant Survivors of Intimate Partner Violence. Health Care for Women International. https://doi.org/10.1080/07399332.2020.1833012

Modeling and Prediction

- In incorporating household effects in epidemiologic modeling frameworks, Huber et al. show that R_0 depends on household size linearly for small households and as a square root of size for larger households. *[EDITORIAL NOTE: A pre-print of this manuscript was summarized in the Lit Rep on July 13, 2020.]*

  Huber et al. (Oct 21, 2020). A Minimal Model for Household Effects in Epidemics. Physical Biology. https://doi.org/10.1088/1478-3975/abb209

- Gray et al. suggest that tests for SARS-CoV-2 with poor sensitivity and specificity could be potentially worse than not implementing tests at all in a model-based analysis. The model scenarios include no lockdown, immunity passports, and incremental relaxation. Tests, even if highly sensitive, are not sufficient to prevent widespread infection in the no lockdown scenario. Antibody testing, even with high sensitivity, is potentially risky in low-prevalence settings in the immunity passport scenario if it is poorly targeted. Tests must be paired with other strategies, such as effective contact tracing, in the relaxation scenario.

  Gray et al. (Oct 21, 2020). Is "No Test Is Better than a Bad Test"? Impact of Diagnostic Uncertainty in Mass Testing on the Spread of COVID-19. PLOS ONE. https://doi.org/10.1371/journal.pone.0240775

Public Health Policy and Practice

- A comparative analysis of the COVID-19 case-fatality rates (CFR) of seven countries suggests that age structure of cases could account for the wide variation of CFRs among countries. The crude country-level CFRs ranged from 0.82% (Israel) to 14.2% (Italy), resulting in a highest to lowest crude CFR ratio of 17.3. Meanwhile, the ratio of lowest to highest age-adjusted ratio is 2.57.

  Green et al. (Oct 21, 2020). The Confounded Crude Case-Fatality Rates (CFR) for COVID-19 Hide More than They Reveal—a Comparison of Age-Specific and Age-Adjusted CFRs between Seven Countries. PLOS ONE. https://doi.org/10.1371/journal.pone.0241031

- Cross-sectional surveys of 20,558 adults in the UK administered before and after the COVID-19 lockdown (April 2019-February 2020 and April 2020, respectively) found that the lockdown was not associated with significant changes in smoking prevalence, but was associated with increases in quit attempts, quit success, and cessation among past-year smokers. The lockdown was also associated with increased high-risk drinking, but also with increased alcohol reduction attempts by high-risk drinkers. However, use of evidence-based support for alcohol reduction among high-risk drinkers decreased.

  Jackson et al. (Oct 21, 2020). Association of the Covid-19 Lockdown with Smoking, Drinking, and Attempts to Quit in England: An Analysis of 2019-2020 Data. Addiction. https://doi.org/10.1111/add.15295

Other Resources and Commentaries

- Why Decoding the Immune Response to COVID Matters for Vaccines – Nature (Oct 22)
- The False Promise of Herd Immunity for COVID-19 – Nature (Oct 21)
- Harnessing Collaborative Care to Meet Mental Health Demands in the Era of COVID-19 – JAMA Psychiatry (Oct 21)

- Will Covid-19 Vaccines Save Lives? Current Trials Aren't Designed to Tell Us – BMJ (Oct 21)
- Covid-19 Vaccine Trial Protocols Released – BMJ (Oct 21)
- A Perspective on Re-Detectable Positive SARS-CoV-2 Nucleic Acid Results in Recovered COVID-19 Patients – Disaster Medicine and Public Health Preparedness (Oct 22)
- Population-Based Prevalence Surveys during the COVID-19 Pandemic a Systematic Review – MedRxiv (Oct 22)
- Understanding COVID-19 Vaccine Efficacy – Science (Oct 21)
- Opinion: A Risk–Benefit Framework for Human Research during the COVID-19 Pandemic – Proceedings of the National Academy of Sciences (Oct 21)
- The Bumpy Road to Achieve Herd Immunity in COVID-19 – Journal of Immunoassay and Immunochemistry (Oct 21)
- Family Violence against Children in the Wake of COVID-19 Pandemic: A Review of Current Perspectives and Risk Factors – Child and Adolescent Psychiatry and Mental Health (Oct 20)
- The Missing Piece — SARS-CoV-2 Testing and School Reopening – New England Journal of Medicine (Oct 21)
- Audio Interview: Tocilizumab and Covid-19 – New England Journal of Medicine (Oct 22)
- The Challenges of Expanding Rapid Tests to Curb COVID-19 – JAMA (Oct 21)
- Covid-19 Vaccine Trials and Incarcerated People — The Ethics of Inclusion – New England Journal of Medicine (Oct 21)
- Assessing and Managing the Risks of COVID-19 in the Workplace: Applying Industrial Hygiene (IH)/Occupational and Environmental Health and Safety (OEHS) Frameworks – Toxicology and Industrial Health (Oct 21)

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