2019-nCoV Literature Situation Report (Lit Rep)

August 17, 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

- **Utah reported 1,389 COVID-19 cases associated with 210 workplace-related outbreaks during March 6–June 5, 2020, which occurred most commonly in the areas of manufacturing (20%), construction (15%), and wholesale trade (14%). Hispanic and nonwhite workers accounted for a large disproportional number of workplace outbreak-associated COVID-19 cases.** More
- **No excess mortality was identified among children in England based on death registration data through May 3, 2020, and surveillance data indicated that the SARS-CoV-2 test positivity rate was markedly lower in children than in adults (4% versus 19%-35%).** More
- **A modeling study focused on King County in Washington State predicts that returning only elementary schools to in-person instruction on an A/B 2-day a week schedule would result in a cumulative risk of COVID infection in students, staff and teachers of below 1.2%.** More
- **Among 76 COVID-19 hotspot counties in the US, there was disproportionately high incidence of COVID-19 cases among underrepresented racial/ethnic groups.** More

Transmission

- During March 6–June 5, 2020, Utah reported 1,389 COVID-19 cases associated with 210 workplace-related outbreaks, defined as the occurrence of two or more laboratory-confirmed cases occurring within the same 14-day period among coworkers in a common workplace (median cases per outbreak=4; range=2–79) involving 15 industry sectors, most frequently in manufacturing (20%), construction (15%), and wholesale trade (14%). In total, 970 (73%) of persons with workplace outbreak-associated COVID-19 were identified as Hispanic or nonwhite, although these ethnic/racial groups represent <24% of Utah's workforce in the 15 affected industry sectors. The authors conclude that mitigation strategies should be culturally and linguistically responsive to racial/ethnic minority workers disproportionately affected by COVID-19.

  Bui et al. (Aug 17, 2020). Racial and Ethnic Disparities Among COVID-19 Cases in Workplace Outbreaks by Industry Sector — Utah, March 6–June 5, 2020. MMWR. https://doi.org/10.15585/mmwr.mm6933e3

- Moore et al. calculated the disparities in COVID-19 cases among underrepresented racial/ethnic groups in 76 counties in 22 US states identified as hotspots during June 5–18, 2020.
- They report that 76 (96%) analyzed hotspot counties had disparities in cases identified among underrepresented racial/ethnic groups during February–June 2020: 59 (75%) counties had disparities among Hispanic residents; 22 (28%) among black residents; 3 (4%) among American

Indian/Alaska Native (AI/AN) residents; 4 (5%) among Asian residents; and 19 (24%) among Native Hawaiian/other Pacific Islander (NPHI) residents.

Moore et al. (Aug 14, 2020). Disparities in Incidence of COVID-19 Among Underrepresented Racial/Ethnic Groups in Counties Identified as Hotspots During June 5–18, 2020 — 22 States, February–June 2020. MMWR. https://doi.org/10.15585/mmwr.mm6933e1

Testing and Treatment

- Ladhani et al. analyzed public health surveillance data including 540,305 people tested for SARS-CoV-2 in England through May 3, 2020 and found that 1408/35,200 (4%) tests were positive among children younger than 16, compared to 19%-35% positive among adult age groups. Children accounted for 1.1% of SARS-CoV-2 positive cases. These included 8 deaths among children, three of whom had multiple co-morbidities and an additional four in whom SARS-CoV-2 was determined to be an indirect contributor to death from another cause. There was no evidence of excess mortality in children during this period.

  Ladhani et al. (Aug 12, 2020). COVID-19 in Children: Analysis of the First Pandemic Peak in England. Archives of Disease in Childhood. https://doi.org/10.1136/archdischild-2020-320042

- Based on 210 patients with laboratory-confirmed COVID-19 in ICUs in New Jersey, receiving the drug tocilizumab was associated with a 40% reduction in mortality (aHR=0.6, 95%CI 0.5-0.9) compared with 420 propensity score-matched patients who did not receive tocilizumab.

  Biran et al. (Aug 14, 2020). Tocilizumab among Patients with COVID-19 in the Intensive Care Unit: A Multicentre Observational Study. The Lancet Rheumatology. https://doi.org/10.1016/S2665-9913(20)30277-0

Immunity

- *[Preprint, not peer-reviewed]* Miyara et al. analyzed the sera of 76 healthy French donors drawn in 2015 to test the hypothesis that past infections or immunizations related to the common alpha- and beta-coronavirus could lead to cross-protection against SARS-CoV-2. They reported 6 serological samples (8%) were reactive to SARS-CoV-2 antigens. Additionally, they detected serum IgG reactivity to common coronaviruses in the early sera of 8 patients with severe COVID-19 before the appearance of anti-SARS-CoV-2 antibodies. The authors concluded that pre-existing immunity to common coronaviruses does not confer cross-protection against SARS-CoV-2.

  Miyara et al. (Aug 15, 2020). Pre-COVID-19 Humoral Immunity to Common Coronaviruses Does Not Confer Cross-Protection against SARS-CoV-2. Pre-print downloaded Aug 17 from https://doi.org/10.1101/2020.08.14.20173393

Clinical Characteristics and Health Care Setting

- A study of patients with COVID-19 (n=60) in Fuyang, China found that 68% had neurological symptoms during infection and 55% still had symptoms 3 months after infection. Brain imaging identified a variety of significantly different neurological characteristics between COVID-19 patients and non-COVID-19 volunteers (n=39) that could be relevant to long-term consequences of SARS-CoV-2.

  Lu et al. (Aug 3, 2020). Cerebral Micro-Structural Changes in COVID-19 Patients – An MRI-Based 3-Month Follow-up Study. EClinicalMedicine. https://doi.org/10.1016/j.eclinm.2020.100484

Mental Health and Personal Impact

- López-Bueno et al. observed that among 2,250 Spanish adults confined due to COVID-19 restrictions on movement (March 22-29, 2020), those who adhered to WHO guidelines for physical activity reported lower perceived anxiety and lower perceived worse mood.

  López-Bueno et al. (July 23, 2020). Association Between Current Physical Activity and Current Perceived Anxiety and Mood in the Initial Phase of COVID-19 Confinement. Frontiers in Psychiatry. https://doi.org/10.3389/fpsyt.2020.00729

- *[Preprint, not peer-reviewed]* Taquet et al. used anonymized electronic health record data from 69 million patients in the US, including over 62,000 cases of COVID-19, to identify relationships between COVID-19 episodes and adverse mental health consequences. They report that among patients with no prior psychiatric history, COVID-19 was associated with an increased incidence of psychiatric diagnoses in the three months after infection compared to other health events (HR range 1.6-2.2). A psychiatric diagnosis in the previous year was associated with a 65% higher incidence of COVID-19 ($p<0.001$).

  Taquet et al. (Aug 16, 2020). Bidirectional Associations between COVID-19 and Psychiatric Disorder a Study of 62354 COVID-19 Cases. Pre-print downloaded Aug 17 from https://doi.org/10.1101/2020.08.14.20175190

Modeling and Prediction

- *[Preprint, not peer-reviewed]* Modeling based on King County in Washington State indicates that returning to a level of 75% of pre-COVID-19 physical interactions between May 15-July 15 would result in 350 daily deaths by early September 2020. Maintaining less than 45% of pre-COVID-19 physical interactions was required to ensure low levels of daily infections and deaths. A combination of increased testing, isolation of symptomatic infections, and contact tracing permitted 60% of pre-COVID-19 physical interactions and allowed opening of schools with <15 daily deaths.

  Bracis et al. (Aug 16, 2020). Widespread Testing Case Isolation and Contact Tracing May Allow Safe School Reopening with Continued Moderate Physical Distancing a Modeling Analysis of King County WA Data. Pre-print downloaded Aug 17 from https://doi.org/10.1101/2020.08.14.20174649

- *[Preprint, not peer-reviewed]* Cohen et al. estimated that 5-42% of schools would have at least one person with active COVID-19 on the first day of arrival, depending on the incidence of COVID-19 in the local community. Using the Covasim agent-based model, they estimate that 10-25% of staff and 6-17% of students would be infected in the first three months in a scenario where all students return to in-person learning without mitigation measures such as face masks, six-foot separation, and handwashing. An approach with only elementary schools returning to in-person on an A/B 2-day a week schedule, while other schools remain remote, would reduce the cumulative risk in school to below 1.2%. They estimated more than seven times as many COVID-19 cases among people in schools if schools reopen at a community incidence rate of 110/100,000 versus 20/10,000.

  Cohen et al. (Aug 13, 2020). Maximizing Education While Minimizing COVID Risk : Priorities and Pitfalls for Reopening Schools. Institute for Disease Modeling. https://covid.idmod.org/data/Maximizing_education_while_minimizing_COVID_risk.pdf

- *[Preprint, not peer-reviewed]* Matrajt et al. used an age-stratified model to determine optimal vaccine allocation for a population with an age distribution based on Washington State. Results suggest that 70% vaccine effectiveness (VE) would be enough to substantially mitigate the ongoing

pandemic if at least 50% of the population is optimally vaccinated. For a low vaccination coverage among the population (<20%), the optimal allocation to minimize death is to vaccinate the high-risk (older) age-groups first, but the optimal allocation changes in a scenario with higher coverage (>40-60%) to prioritize vaccine to the high-transmission groups (those aged 20-50 and children) first.

Matrajt et al. (Aug 16, 2020). Vaccine Optimization for COVID-19 Who to Vaccinate First. Pre-print downloaded Aug 17 from https://doi.org/10.1101/2020.08.14.20175257

- *[Preprint, not peer-reviewed]* Germany introduced restrictive shutdown measures in March 2020. The reproductive rate (R_t) fell below one in April 14. On April 20th, a gradual loosening of the restrictions was announced. With a lag of two weeks R_t increased again at the beginning of May. Based on these data during the initial shutdown phase, Dorn et al. constructed a simulation model to project the number of additional COVID-19 deaths until July 31st, 2021 with different scenarios of further loosening or tightening the shutdown measures. They report that a gradual opening approach is economically optimal, whereas costs are higher for a more extensive opening process.

  Dorn et al. (Aug 16, 2020). The Common Interests of Health Protection and The Economy Evidence from Scenario Calculations OfCOVID-19 Containment Policies. Pre-print downloaded Aug 17 from https://doi.org/10.1101/2020.08.14.20175224

Other Resources and Commentaries

- Humanitarian Crises in a Global Pandemic – The Lancet (Aug 15)
- The EVALI Outbreak and Vaping in the COVID-19 Era – The Lancet Respiratory Medicine (Aug 14)
- Influenza in the COVID-19 Era – JAMA (Aug 14)
- Comparison of International Classification of Diseases and Related Health Problems, Tenth Revision Codes With Electronic Medical Records Among Patients With Symptoms of Coronavirus Disease 2019 – JAMA Network Open (Aug 14)
- The Effect of Smoking on COVID-19 Symptom Severity Systematic Review and Meta-Analysis – medRxiv (Aug 17)

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