

2019-nCoV Literature Situation Report (Lit Rep)

November 5, 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

- **Modeling of K-12 school reopening in King County, Washington suggests that SARS-CoV-2 screening with PCR or antigen tests would provide little additional benefit if in-school countermeasures, which can be highly effective in reducing in-school transmission, are observed.** [More](#)
- **A survey of US adults found that symptomatic working adults who received a positive PCR test were more likely to report going exclusively to an office or school setting 2 weeks prior to symptom onset, compared to those who received negative results.** [More](#)
- **6.3% of 2,547 first responders with prior COVID-19 were found to be seronegative. The proportion seronegative was relatively stable from day 14 to 90, while illness severity, immunosuppressive medications, non-Hispanic white race/ethnicity, and obesity were associated with lack of antibodies.** [More](#)

Non-Pharmaceutical Interventions

- Symptomatic US adults with positive SARS-CoV-2 PCR tests were 1.8 times more likely to report going exclusively to an office or school setting (versus telework) in the 2 weeks prior to symptom onset compared to those with negative test results (n=248). While case-patients were less likely to telework on a full- or part-time basis, the association persisted (aOR=2.1) even when the analysis was restricted to participants who reported working non-essential jobs (e.g., jobs outside of healthcare, factories, correctional facilities, or education).
Fisher et al. (Nov 6, 2020). Telework Before Illness Onset Among Symptomatic Adults Aged ≥18 Years With and Without COVID-19 in 11 Outpatient Health Care Facilities — United States, July 2020. MMWR. Morbidity and Mortality Weekly Report.
<https://doi.org/10.15585/mmwr.mm6944a4>
- A strong gradient between neighborhood-level income and physical distancing was observed from smartphone mobility data across the US in 210,288 census block groups from January to April 2020. Though there was an increase in proportion of smartphone users staying at home from all income levels around mid-March, the increase in number of days at home was substantially greater among individuals in high-income neighborhoods. Conversely, residents in low-income neighborhoods were more likely to work outside of home than residents from high-income neighborhoods, highlighting

barriers to implementing physical distancing in lower-income neighborhoods. However, non-work activities outside of home were similar by neighborhood income.

Jay et al. (Nov 3, 2020). *Neighbourhood Income and Physical Distancing during the COVID-19 Pandemic in the United States*. *Nature Human Behaviour*. <https://doi.org/10.1038/s41562-020-00998-2>

- In a cross-sectional survey among US adults (n=3,474), 52.7% reported having “high” perceptions of the effectiveness of recommended behaviors against COVID-19 infection. In regression analysis, COVID-19 related worry and perceived threat to physical health were positively associated with perceived effectiveness. Adjusting for demographics, healthcare characteristics, and health beliefs, perceived severity of COVID-19 and perceived likelihood of infection became negatively associated with perceived effectiveness.

Kasting et al. (Nov 4, 2020). *Public Perceptions of the Effectiveness of Recommended Non-Pharmaceutical Intervention Behaviors to Mitigate the Spread of SARS-CoV-2*. *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0241662>

- A cross-sectional survey of UK adults (n=6,149) found 24.3% of participants perceived they previously had COVID-19, although only 4% reported receiving a positive test. Participants who believed they had COVID-19 were more likely to report believing they had some level of immunity, and less likely to report adhering to lockdown measures, being worried about COVID-19, or know common COVID-19 symptoms.

Smith et al. (Nov 4, 2020). *The Impact of Believing You Have Had COVID-19 on Self-Reported Behaviour: Cross-Sectional Survey*. *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0240399>

Transmission

- Among 262 patients with COVID-19, 14.5% were found to be re-detectable positive (RP) after at least 14 days of follow up. Most RP patients were young (under 60), initially had mild to moderate illness, and had earlier RNA-negative conversion from illness onset (less than 3 weeks) than non-RP patients. All RP patients were readmitted for observation, but none displayed fever and just a small number reported mild cough and chest tightness. No suspected transmission occurred among all 21 close contacts of RP patients.

An et al. (Sept 2020). *Clinical Characteristics of Recovered COVID-19 Patients with Re-Detectable Positive RNA Test*. *Annals of Translational Medicine*. <https://doi.org/10.21037/atm-20-5602>

- [Pre-print, not peer-reviewed] A household serological survey conducted in Geneva from April to June (n=2,267 households) estimated a 17.2% risk of being infected with SARS-CoV-2 by a single household member compared to a 5.1% cumulative infection risk (through June 30th) from exposures outside the household. Infection risk from an infected household member increased with age, while working-age adults (20-49 years) had the highest infection risk from outside the household. Asymptomatic household members were less likely to transmit to another member compared to those reporting symptoms.

Bi et al. (Nov 4, 2020). *Household Transmission of SARS-COV-2 Insights from a Population-Based Serological Survey*. Pre-print downloaded Nov. 5 from <https://doi.org/10.1101/2020.11.04.20225573>

- [Pre-print, not peer-reviewed] Player interaction and proximity analysis of 4 professional rugby matches in which 8 players were retrospectively found to have SARS-CoV-2 suggest that risk of in-

game transmission may be minimal. While video footage analysis and GPS data show the positive players were within 2 meters of other players for up to 316 seconds during 60 interactions, only 1 of 28 identified contacts and 5 of 100 players on opposing teams had positive tests, all of which were eventually linked to either internal club outbreaks or wider-community transmission.

Jones et al. (Nov 4, 2020). SARS-CoV-2 Transmission during Team-Sport Do Players Develop COVID-19 after Participating in Rugby League Matches with SARS-CoV-2 Positive Players. Pre-print downloaded Nov. 5 from <https://doi.org/10.1101/2020.11.03.20225284>

- In France, among 26 SARS-CoV-2 positive mothers and their neonates, nasopharyngeal and anal swabs from neonates at birth, day 3, and weekly if hospital stay was prolonged, only detected one positive PCR test in an anal swab at birth; nasopharyngeal swabs were negative at day 0 and 3. The infant never developed symptoms. None of the newborns were re-hospitalized during their first month of life.

Martenot et al. (Nov 3, 2020). Favorable Outcomes among Neonates Not Separated from Their Symptomatic SARS-CoV-2-Infected Mothers. Pediatric Research.

<https://doi.org/10.1038/s41390-020-01226-3>

- In serological and molecular testing of inmates and personnel in an Italian prison with rapid serological IgG/IgM tests for SARS-CoV-2, 3 of 485 prisoners had positive serology results. New prisoners had been isolated for 14 days. All prisoners and personnel had negative nasopharyngeal swabs.

Pagano et al. (Oct 31, 2020). COVID-19 Risk Management and Screening in the Penitentiary Facilities of the Salerno Province in Southern Italy. International Journal of Environmental Research and Public Health. <https://doi.org/10.3390/ijerph17218033>

- Repeat cross-sectional serosurveys conducted from February to July of residual clinical samples from two patient groups in a New York Hospital -- 1) an urgent care (UC) group, enriched with COVID-19 cases, and 2) a routine care (RC) group, which resembles the general population -- identified seropositive samples from mid-February, though the first case of COVID-19 in New York City was not confirmed until March 1. Following peaks in March-April, seroprevalence then declined to slightly above 20% through July in both groups, which the authors note as significantly lower than what would be required for herd immunity.

Stadlbauer et al. (Nov 3, 2020). Repeated Cross-Sectional Sero-Monitoring of SARS-CoV-2 in New York City. Nature. <https://doi.org/10.1038/s41586-020-2912-6>

Geographic Spread

- Analysis of 247 SARS-CoV-2 sequences from two nearby communities in Wisconsin illustrate distinct patterns of viral spread. Though Dane County had the 12th known introduction of SARS-CoV-2 in the US, this did not lead to community spread. 60 miles away, Milwaukee County experienced few introductions followed by extensive community spread.

Moreno et al. (Nov 3, 2020). Revealing Fine-Scale Spatiotemporal Differences in SARS-CoV-2 Introduction and Spread. Nature Communications. <https://doi.org/10.1038/s41467-020-19346-z>

Vaccines and Immunity

- A total of 6.3% of 2,547 healthcare workers and first responders in the New York City and Detroit metropolitan areas with previous confirmed SARS-CoV-2 infection were seronegative. Among symptomatic persons, the proportion seronegative was largely stable between 2 weeks and 90 days following symptom onset. The proportion seronegative ranged from 0% among 79 persons previously hospitalized to 11% among 308 persons with asymptomatic infections. Additionally, immunosuppressive medications, non-Hispanic white race/ethnicity, and obesity were associated with lack of antibodies.

Petersen et al. (Nov 4, 2020). Lack of Antibodies to SARS-CoV-2 in a Large Cohort of Previously Infected Persons. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa1685>

Clinical Characteristics and Health Care Setting

- In an observational retrospective cohort study in Huangshi, China, 23 out of 368 recovered COVID-19 patients quarantined for 14 days post-discharge retested positive for SARS-CoV-2. Retesting positivity was associated with a higher ratio of lymphocytes on admission and presence of comorbidities, while negatively associated with a lower peak temperature during hospitalization and arbidol treatment.

Zhou et al. (Nov 4, 2020). Clinical Characteristics of Re-Positive COVID-19 Patients in Huangshi, China: A Retrospective Cohort Study. PLoS One. <https://doi.org/10.1371/journal.pone.0241896>

Modeling and Prediction

- *[Pre-print, not peer-reviewed]* Modeling of K-12 school reopening in King County, Washington found that if in-school countermeasures are observed, diagnostic screening either with PCR tests or rapid antigen tests may be of little benefit due to a higher rate of false positive tests in this low prevalence setting. Modeled in-school countermeasures included daily symptom screening, contact tracing, face masks, hand hygiene, improved ventilation, and physical distancing. Countermeasures could reduce the 3-month cumulative incidence to 2% or less for students, teachers, and staff. In this setting, school-based transmission was also found to be a limited driver of community spread, holding the effective reproduction number $Re = 1$ over 3 months.

Klein et al. (Nov 5, 2020). Testing the waters: is it time to go back to school? Diagnostic screening as a COVID-19 risk-mitigation strategy for reopening schools in King County, WA. Institute for Disease Modeling. Downloaded Nov. 5 from https://covid.idmod.org/data/Testing_the_waters_time_to_go_back_to_school.pdf

Other Resources and Commentaries

- [Challenges in Creating Herd Immunity to SARS-CoV-2 Infection by Mass Vaccination](#) – The Lancet (Nov 5)
- [What the COVID-19 Pandemic Has Reinforced: The Need for Accurate Data](#) – Clinical Infectious Diseases (Nov 4)
- [Reexamining Health Care Coalitions in Light of COVID-19](#) – Disaster Medicine and Public Health Preparedness (Nov 4)
- [Informing Children Citizens Efficiently to Better Engage Them in the Fight against COVID-19 Pandemic](#) – PLOS Neglected Tropical Diseases (Nov 4)

- [Beyond R 0 : Heterogeneity in Secondary Infections and Probabilistic Epidemic Forecasting](#) – Journal of The Royal Society Interface (Nov 4)
- [An Analysis of K-12 School Reopening and Its’ Impact on Teachers](#) – Journal of Primary Care & Community Health (Jan 4)
- [Covid-19: Experts Debate Merits of Lockdowns versus “Focused Protection”](#) – BMJ (Nov 3)
- [Opinion: To Stop the next Pandemic, We Need to Unravel the Origins of COVID-19](#) – Proceedings of the National Academy of Sciences (Nov 3)
- [Four Ways Trump Has Meddled in Pandemic Science — and Why It Matters](#) – Nature (Nov 3)

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