2019-nCoV Literature Situation Report (Lit Rep)

September 21, 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

- **Two studies identified SARS-CoV-2 transmission on international flights using contract tracing and/or genetic sequencing. Closer seating proximity was associated with greater infection risk.** More and More
- **Patients in a clinical trial with severe COVID-19 who received convalescent plasma early in disease progression had lower mortality (13% vs 55%) and shorter hospital length of stay (15.4 vs 33 days) than patients with critical COVID-19 who received plasma later.** More
- **A modeling study estimated that community infections with SARS-CoV-2 would increase by 87% when university students return, even if the students engaged in a 24% reduction in contacts compared to pre-COVID levels.** More
- **From April 22 to July 15, 2020, people in prison in the US had a 2.8-fold higher COVID-19 mortality rate than the general population. Five states reported COVID-19 deaths that exceeded 50% of their deaths from all causes in past years.** More

Non-Pharmaceutical Interventions

- The closure of nonessential businesses and out-of-home activity restrictions implemented on March 22, 2020 in New York city decreased the positivity rate of tests for SARS-CoV-2 by 25% (54% in early April to 14% in early May). Using data on SARS-CoV-2 testing at the zip code level and smart phone location data, Borjas reported that a doubling in the relative number of visits to local businesses was associated with a 12% increase in the proportion of positive tests. A doubling in the relative number of mobile devices that did not leave the home was associated with a 2% lower proportion of positive tests.

  Borjas. (Sept 17, 2020). Business Closures, Stay-at-Home Restrictions, and COVID-19 Testing Outcomes in New York City. Preventing Chronic Disease. https://doi.org/10.5888/pcd17.200264

- Anonymous mobile phone data showed that between March 30 and April 9, 2020, all states in the US experienced a 34%-69% decline in personal mobility. There was a statistically significant negative correlation (r = -0.79) between the proportion of Republicans/leaning Republicans and adherence to non-pharmaceutical interventions, adjusting for urbanization, proportion of essential workers, population, Gini index, and poverty rates.

  Hsiehchen et al. (Aug 19, 2020). Political Partisanship and Mobility Restriction during the COVID-19 Pandemic. Public Health. https://doi.org/10.1016/j.puhe.2020.08.009

Transmission

- Image-based analysis showed that droplets expelled during singing followed the ambient airflow pattern and did not appear to settle down rapidly without adequate ventilation,pointing to aerosol generation during singing. The number of droplets expelled varied between individuals and parameters including loudness, notes, consonants, and duration of each note sung.

  Bahl et al. (Sept 18, 2020). Droplets and Aerosols Generated by Singing and the Risk of COVID-19 for Choirs. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa1241

- *[Pre-print, not peer reviewed]* Residents with symptomatic and pre-symptomatic/unrecognized SARS-COV-2 infection in a Dutch nursing home outbreak had similar levels of viral shedding. Weekly facility-wide testing at the nursing home that began after admission of a resident who was recently hospitalized identified an additional positive residents (29 symptomatic, 38 pre-symptomatic, 7 asymptomatic), resulting in a total of 113 cases.

  Besselaar et al. (Sept 18, 2020). A COVID-19 Nursing Home Transmission Study Sequence and Metadata from Weekly Testing in an Extensive Nursing Home Outbreak. Pre-print downloaded Sept 21 from https://doi.org/10.1101/2020.09.15.20195396

- Four individuals with SARS-CoV-2 infection had traveled on the same flight from Boston to Hong Kong on March 9, 2020. An epidemiologic investigation revealed that all four had identical virus genetic sequences belonging to a clade not previously identified in Hong Kong. The authors conclude that viral transmission likely occurred during the flight shared by these travelers.

  Choi et al. (Sept 18, 2020). In-Flight Transmission of Severe Acute Respiratory Syndrome Coronavirus 2. Emerging Infectious Diseases. https://doi.org/10.3201/eid2611.203254

- Following a 10-hour flight from London, UK to Hanoi, Vietnam on March 2, 2020, 16 of 217 passengers (7%) were found to be positive for SARS-CoV-2 after contact tracing, of whom 12 (75%) were seated in business class along with the only symptomatic person (attack rate 62%). Seating proximity was strongly associated with increased infection risk (OR=7.3).

  Khanh et al. (Sept 18, 2020). Transmission of Severe Acute Respiratory Syndrome Coronavirus 2 During Long Flight. Emerging Infectious Diseases. https://doi.org/10.3201/eid2611.203299

- Lednicky et al. reported the detection of viable SARS-CoV-2 in air samples collected 2 to 4.8 m away from 2 hospitalized patients with COVID-19. The genome sequence of the SARS-CoV-2 strain isolated from air samplers was identical to that isolated from the newly admitted patient. The authors conclude that aerosols generated by patients with respiratory manifestations of COVID-19 may serve as a source of SARS-CoV-2 transmission*. [EDITORIAL NOTE: This manuscript was previously summarized as a pre-print on August 12, 2020].*

  Lednicky et al. (Sept 15, 2020). Viable SARS-CoV-2 in the Air of a Hospital Room with COVID-19 Patients. International Journal of Infectious Diseases. https://doi.org/10.1016/j.ijid.2020.09.025

Testing and Treatment

- Of 38 hospitalized COVID-19 patients who received convalescent plasma in Connecticut and Massachusetts, 24 (63%) recovered and were discharged, and 14 (37%) died. Sixteen patients (42%) with severe illness who received plasma early in disease progression had lower mortality (13% vs. 55%, p<0.02) and shorter mean hospital length of stay (15.4 vs. 33 days, p<0.01) than 22 patients

(58%) with critical illness who receive plasma later. One patient experienced a transient transfusion reaction. No other adverse effects were observed.

Ibrahim et al. (Sept 20, 2020). Factors Associated with Good Patient Outcomes Following Convalescent Plasma in COVID-19: A Prospective Phase II Clinical Trial. Infectious Diseases and Therapy. https://doi.org/10.1007/s40121-020-00341-2

- Samples collected on swabs before washing in the morning had higher detection rates of SARS-CoV-2 than samples collected during afternoon on the same day in a study (n=48) completed in Hubei, China. Nasopharyngeal swab detection was 65% in the morning vs. 43% in afternoon, and oropharyngeal swab detection was 23% in morning vs. 8% in afternoon, both $p<0.05$. Nasopharyngeal swabs had significantly higher detection rate in both time periods than oropharyngeal swabs. There was no statistically significant difference between nasopharyngeal swabs and nasal swabs in both time periods (morning: 65% in nasopharyngeal vs. 58% in nasal; afternoon: 43% in nasopharyngeal vs. 35% in nasal).

  Liu et al. (Sept 16, 2020). Value of Swab Types and Collection Time on SARS-COV-2 Detection Using RT-PCR Assay. Journal of Virological Methods. https://doi.org/10.1016/j.jviromet.2020.113974

Clinical Characteristics and Health Care Setting

- In an emergency department in Richmond, Virginia, the total number of nonfatal opioid overdose visits between March-June 2020 was 227, a 2.2-fold increase compared to the same period in 2019 (n=102), with a higher proportion of patients who were Black (80% vs. 63%).

  Ochalek et al. (Sept 18, 2020). Nonfatal Opioid Overdoses at an Urban Emergency Department During the COVID-19 Pandemic. JAMA. https://doi.org/10.1001/jama.2020.17477

Modeling and Prediction

- *[Pre-print, not peer reviewed]* A modeling study reported that university students returning to schools may contribute to increased community transmission of COVID-19, affecting at-risk members of the city community. This is supported by a scenario that if students engage in a 24% contact reduction compared to pre-COVID levels, the number of community infections would increase by 87%, with 71% of the incremental infections occurring in the general population. If students have an initial, short-term increase in contacts with other students before engaging in contact reduction behaviors, the community infection would increase by over 150%.
- Screening asymptomatic students every 5 days reduces 42% of infections attributable to the introduction of students and delays the re-engagement of social and economic restrictions by 1 week. One-time mass screening of students prevents fewer infections, but is highly efficient in terms of infections prevented per screening test performed.

  Cipriano et al. (Sept 18, 2020). Impact of University Re-opening on Total Community COVID-19 Burden. Pre-print downloaded Sept 21 from https://doi.org/10.1101/2020.09.18.20197467

- Neilan et al. conducted a modeling study to examine testing strategies for SARS-CoV-2 under scenarios of different transmission intensity. In a scenario where transmission is slowing (R_e=0.9), testing the entire population monthly and testing people with COVID-19 symptoms as needed would reduce infections by 63% and mortality by 44% compared to testing only patients with severe/critical symptoms warranting hospitalization, but would require >66-fold more tests/day with 5-fold higher costs. Despite modest sensitivity, low-cost (≤$5), repeat screening (every 14-day) of the entire population could be cost-effective in all epidemic settings.

Neilan et al. (Sept 18, 2020). Clinical Impact, Costs, and Cost-Effectiveness of Expanded SARS-CoV-2 Testing in Massachusetts. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa1418

Public Health Policy and Practice

- *[Pre-print, not peer reviewed]* The increase in COVID-19 mortality among people in prison has outpaced the rates for the general population. Using data from the COVID Prison Project from 53 prison systems in the US, Nowotny et al. reported that from April 22 to July 15, 2020, people in prison experienced a standardized mortality rate 2.8 times higher than the general population. Departments of correction in 5 states have reported COVID-19 deaths that exceed 50% of their deaths from all causes in past years.

  Nowotny et al. (Sept 18, 2020). Disparities in COVID-19 Related Mortality in U.S. Prisons and the General Population. Pre-print downloaded Sept 21 from https://doi.org/10.1101/2020.09.17.20183392

Other Resources and Commentaries

- Understanding Mexican health worker COVID-19 deaths – The Lancet (Sept 19)
- Warp Speed for COVID-19 Vaccines: Why Are Children Stuck in Neutral? – Clinical Infectious Diseases (Sept 18)
- The Urgent and Growing Needs of Youths Experiencing Homelessness During the COVID-19 Pandemic – Journal of Adolescent Health (Oct 1)
- COVID-19 Impact on Behaviors across the 24-Hour Day in Children and Adolescents: Physical Activity, Sedentary Behavior, and Sleep – Children (Sept 16)
- Parents' and Guardians' Views on the Acceptability of a Future Covid-19 Vaccine a Multi-Methods Study in England – medRxiv (Sept 18)
- A CostBenefit Analysis of Clinical Trial Designs for COVID-19 Vaccine Candidates – medRxiv (Sept 18)
- The COVID-19 Immune Landscape Is Dynamically and Reversibly Correlated with Disease Severity – BioRxiv (Sept 18)
- Safety and Efficacy of the Russian COVID-19 Vaccine: More Information Needed – The Lancet (Sept 21)
- Health Risks and Outcomes That Disproportionately Affect Women during the Covid-19 Pandemic: A Review – Social Science & Medicine (1982) (Sept 13)
- Black Health Matters Too… Especially in the Era of Covid-19: How Poverty and Race Converge to Reduce Access to Quality Housing, Safe Neighborhoods, and Health and Wellness Services and Increase the Risk of Co-Morbidities Associated with Global Pandemics – Journal of Racial and Ethnic Health Disparities (Sept 21)
- Infant Outcomes Following Maternal Infection with SARS-CoV-2: First Report from the PRIORITY Study – Clinical Infectious Diseases (Sept 18)
- Don't Let COVID-19 Disrupt Campus Climate Surveys of Sexual Harassment – PNAS (Sept 18)
- Safety and Efficacy of the Russian COVID-19 Vaccine: More Information Needed – Authors' Reply – The Lancet (Sept 21)
- Strict Lockdown versus Flexible Social Distance Strategy for COVID-19 Disease a Cost-Effectiveness Analysis – medRxiv (Sept 18)
- Superspreaders Provide Essential Clues for Mitigation of COVID-19 – medRxiv (Sept 18)
- Usefulness of PCR Screening in the Initial Triage of Trauma Patients During COVID-19 Pandemic – Journal of Orthopaedic Trauma (July 13)

- Invisible No More: The Impact of COVID-19 on Essential Food Production Workers. – Journal of Agromedicine (Sept 18)
- Who Gets a COVID Vaccine First? Access Plans Are Taking Shape – Nature (Sept 18)
- COVID-19: A Stress Test for Trust in Science – The Lancet (Sept 19)

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