2019-nCoV Literature Situation Report (Lit Rep)

July 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

- **Based on transmission pairs in China, the time between the onset of symptoms in the initially infected individual and symptom onset in the person they infected decreased over time, which may have been due to the implementation of policies for rapid isolation of people with symptoms of COVID-19.** More
- **Patterns from Google searches may be able to predict COVID-19 case activity by up to 10 days in most states within the US.** More
- **A systematic review found a 16% pooled prevalence of asymptomatic infection (28% among children) among those with confirmed SARS-CoV-2 infection.** More
- **A non-randomized study in Iran found that convalescent plasma recipients had higher proportions of hospital discharge, shorter mean length of hospitalization, and lower proportion requiring intubation.** More
- **A modeling study based on a large city in Brazil suggests that physical distancing between neighborhoods compared to within neighborhoods may be more effective in controlling outbreaks.** More

Non-Pharmaceutical Interventions

- Analyzing 677 transmission pairs in mainland China, Ali et al. found that the COVID-19 serial interval, which is the time between symptom onset for the infector and the infectee in a linked transmission pair, shortened from 7.8 days to 2.6 days between Jan 9 and Feb 13. The serial interval was positively associated with the length of time between a person's symptom onset and their isolation (i.e. isolation delay). The investigators attribute these findings to the adoption of policies for rapid isolation of people with COVID-19 symptoms, and argue that changes in the serial interval indicate effective implementation of transmission reduction interventions.

  Ali et al. (July 21, 2020). Serial Interval of SARS-CoV-2 Was Shortened over Time by Nonpharmaceutical Interventions. Science. https://doi.org/10.1126/science.abc9004

- Morely et al. compared daily estimates of R_t for 8 counties in central New York with publicly available data on measures of social distancing based on mobile phone data and found that the mean R_t dropped as the overall social distancing grade increased.

  Morley et al. (July 16, 2020). Social Distancing Metrics and Estimates of SARS-CoV-2 Transmission Rates. Journal of Public Health Management and Practice. https://doi.org/10.1097/PHH.0000000000001240

Transmission

- Wu et al. tested wastewater collected at a major urban treatment facility in Massachusetts from March 18 to 25, 2020 and observed significantly higher SARS-CoV-2 titers (57 to 303 copies per mL of sewage) than expected based on number of clinically confirmed cases at the time. The investigators suggest that wastewater-based surveillance could help inform relaxing of lockdown and quarantine efforts.

  Wu et al. (July 21, 2020). SARS-CoV-2 Titers in Wastewater Are Higher than Expected from Clinically Confirmed Cases. MSystems. https://doi.org/10.1128/mSystems.00614-20

- After sampling environmental surfaces in the Diamond Princess cruise ship, Yamagishi et al. detected SARS-CoV-2 RNA from 10% of the samples from case-cabins 1-17 days after they were vacated and detected none in non-case-cabins. Asymptomatic and symptomatic case cabins had a similar proportion of detection (21% vs 15%). No viable SARS-CoV-2 virus was isolated from any of the samples.

  Yamagishi et al. (July 21, 2020). Environmental Sampling for Severe Acute Respiratory Syndrome Coronavirus 2 during COVID-19 Outbreak in the Diamond Princess Cruise Ship. The Journal of Infectious Diseases. https://doi.org/10.1093/infdis/jiaa437

Geographic Spread

- *[Pre-print, not peer reviewed]* The New York City Department of Health launched a SARS-CoV-2 cluster detection system using census tract resolution and the geospatial analysis software SaTScan. During June 11-30, 28 unique primary clusters were detected, highlighting the potential of spatiotemporal surveillance to support public health efforts.

  Greene et al. (July 21, 2020). Detecting Emerging COVID-19 Community Outbreaks at High Spatiotemporal Resolution - New York City June 2020. Pre-print downloaded July 22 from https://doi.org/10.1101/2020.07.18.20156901

Testing and Treatment

- A prospective cohort study (n=189) of COVID-19 patient in Iran showed that compared to the control group, participants receiving convalescent plasma therapy (n=115) had a significantly higher proportion of hospital discharge (98% vs 79%), shorter mean length of hospitalization (9.5 days vs 12.9 days), and lower proportion requiring intubation (7% vs 20%).

  Abolghasemi et al. (July 6, 2020). Clinical Efficacy of Convalescent Plasma for Treatment of COVID-19 Infections: Results of a Multicenter Clinical Study. Transfusion and Apheresis Science. https://doi.org/10.1016/j.transci.2020.102875

Clinical Characteristics and Health Care Setting

- A systematic review (41 studies, 50,155 cases) found a pooled estimate that 16% of SARS-CoV-2 cases are asymptomatic across all age groups, with a higher percentage of asymptomatic children (28%). In a subset of initially asymptomatic patients (n=180) who were followed over time, 49% subsequently developed symptoms. The authors noted significant heterogeneity between study estimates of these measures.

  He et al. (July 21, 2020). Proportion of Asymptomatic Coronavirus Disease 2019 (COVID-19): A Systematic Review and Meta-analysis. Journal of Medical Virology. https://doi.org/10.1002/jmv.26326

Mental Health and Personal Impact

- Using nationally a representative US sample (n=34,653) from 2001-2002 and 2004-2005, Elbogen et al. found that cumulative financial strain was predictive of suicide attempts (OR = 1.53, 95%CI: 1.32, 1.77) and highlight the relevance of their findings given the financial strain triggered by the COVID-19 pandemic.

  Elbogen et al. (July 22, 2020). Financial Strain and Suicide Attempts in a Nationally Representative Sample of US Adults. American Journal of Epidemiology. https://doi.org/10.1093/aje/kwaa146

- Pierce et al. conducted a web survey of 17,452 people already participating in a UK national longitudinal study and found that population prevalence of clinically significant levels of mental distress rose from 19% in 2018-19 to 27% in April 2020, one month into the UK lockdown. Increases in individual scores on the GHQ-12, a questionnaire used to assess mental health, was greatest among young people (age 18-34), women, and people living with young children.

  Pierce et al. (July 2020). Mental Health before and during the COVID-19 Pandemic: A Longitudinal Probability Sample Survey of the UK Population. The Lancet Psychiatry. https://doi.org/10.1016/S2215-0366(20)30308-4

Modeling and Prediction

- Wang et al. built a COVID-19 transmission model for Austin, TX incorporating age-stratified risks, contact patterns, and healthcare system factors and found that a 2 week delay in implementing extensive social distancing measures could accelerate the timing of peak healthcare needs by 4 weeks, causing shortages in beds and ICU units. School closures did not affect the epidemic curve.

  Wang et al. (July 21, 2020). Impact of Social Distancing Measures on Coronavirus Disease Healthcare Demand, Central Texas, USA. Emerging Infectious Diseases. https://doi.org/10.3201/eid2610.201702

- *[Pre-print, not peer reviewed]* Using an individual-based age-structured network model calibrated to a large city in Brazil (population: 300,000), Baumgartner et al. found that the model was more sensitive to interactions across different neighborhoods, suggesting that physical distancing at the city-level is more effective in controlling outbreaks and activities within the same neighborhood could only have minor contributions.

  Baumgartner and Lansac-Toha. (July 22, 2020). Assessing the Relative Contributions of Healthcare Protocols for Epidemic Control an Example with Network Transmission Model for COVID-19. Pre-print downloaded July 22 from https://doi.org/10.1101/2020.07.20.20158576

- Cousins et al. found high correlation between regional confirmed case data from the New York Times and Google Trends results 10 days prior in most states (January 21 to April 2, 2020), suggesting that search-engine query patterns may be able to predict case activity while being robust to differences in regional location, population, and date of outbreak.

  Cousins et al. (July 19, 2020). Regional Infoveillance of COVID-19 Case Rates: Analysis of Search-Engine Query Patterns (Preprint). Journal of Medical Internet Research. https://doi.org/10.2196/19483

Other Resources and Commentaries

- Stemming the Losses from COVID-19 – Nature Metabolism (June 19)
- Social Isolation—the Other COVID-19 Threat in Nursing Homes – JAMA (July 16)
- Lessons from Ebola as DRC Grapples with Conflict, Measles, and Covid-19 – BMJ (July 21)
- Serosurveillance and the COVID-19 Epidemic in the US – JAMA (July 21)
- Five Coronavirus Questions Scientists Still Don't Have Answers To – Nature (July 21)
- Consolidation in a Crisis: Patterns of International Collaboration in Early COVID-19 Research – PLOS ONE (July 21)
- The Cost-Effectiveness of Conducting Three versus Two Reverse Transcription-Polymerase Chain Reaction Tests for Diagnosing and Discharging People with COVID-19: Evidence from the Epidemic in Wuhan, China – BMJ Global Health (July 21)
- HIV and SARS-CoV-2: Intersecting Epidemics with Many Unknowns – American Journal of Epidemiology (July 22)
- Ebola Prepared These Countries for Coronavirus — but Now Even They Are Floundering – Nature (July 21)
- Communicating with Children about COVID-19 – The Lancet Infectious Diseases (July 21)
- Evidence of Exposure to SARS-CoV-2 in Cats and Dogs from Households in Italy – Biorxiv (July 21)
- Social Media and Vaccine Hesitancy: New Updates for the Era of COVID-19 and Globalized Infectious Diseases – Human Vaccines & Immunotherapeutics (July 21)
- COVID-19 — Important Considerations for Developing and Using a Vaccine – Human Vaccines & Immunotherapeutics (July 21)
- Feasibility of Separate Rooms for Home Isolation and Quarantine for COVID-19 in the United States – Annals of Internal Medicine (July 21)
- Can Self-Imposed Prevention Measures Mitigate the COVID-19 Epidemic? – PLOS Medicine (July 21)

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