



2019-nCoV Literature Situation Report (Lit Rep)

April 27, 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

- 🔍 **Vertical transmission of SARS-CoV-2 infection from mothers affected by COVID-19 during the last days of pregnancy is possible but relatively infrequent.**
- 🔍 **Strong reliance on automated contact tracing to contain the spread of the SARS-CoV-2 pandemic can lead to the potential danger of allowing the pandemic to spread unchecked.**
- 🔍 **Infection-control strategies that are based solely on symptomatic cases may not be sufficient to prevent transmission after SARS-CoV-2 introduction into the facility.**
- 🔍 **While rapid and strong lock-down is an effective pandemic suppression measure, a combination of other strategies such as social distancing, active protection and removal can achieve similar suppression synergistically.**

Transmission

- Pedrosa studied the effects of weather variables, population density and the timeline of Covid-19 infection on the early pace of spread of Covid-19 all 50 U.S. states and 110 countries. Findings suggest that higher the temperature and the absolute humidity were associated with faster Covid-19 transmission in U.S. states in the early stages of the outbreak.
- A strong positive association was also observed between population density and early faster spread of Covid-19. When these variables are considered together, only population density and the timeline variable show statistical significance. Basic models for other countries also showed weather variables lose statistical significance when timeline is controlled for.

Pedrosa (April 27, 2020). The dynamics of Covid-19: weather, demographics and infection timeline. Pre-print downloaded Apr 27 from <https://doi.org/10.1101/2020.04.21.20074450>

- This study assessed transmission and evaluated the adequacy of symptom-based screening to identify infections in residents in a skilled nursing facility. Of the 48 residents registered for the study, 56% were asymptomatic at second testing and 50% subsequently developed symptoms. A RT-PCR sequencing of specimens isolated from 34 residents fitted into two clusters with a difference of one nucleotide. They concluded that there was rapid and widespread transmission of SARS-CoV-2 in this facility, with more than 50% positive test cases being asymptomatic. They warn that infection-control strategies based solely on symptomatic cases may not be sufficient to prevent transmission after SARS-CoV-2 introduction into the facility.

Arons et al. (April 23, 2020). Presymptomatic SARS-CoV-2 Infections and Transmission in a Skilled Nursing Facility. NEJM. <https://doi.org/10.1056/NEJMoa2008457>

- Hu et al report on seven cases of COVID-19 during late pregnancy and neonatal outcomes. Maternal and neonatal samples were tested with PCR for evidence of vertical transmission. Amniotic fluid samples obtained at delivery from seven patients were negative, and one of the seven neonates tested positive for SARS-CoV-2 infection. These findings suggest that the vertical transmission of SARS-CoV-2 infection from infected mothers during the last days of pregnancy is possible but relatively infrequent.

Hu et al. (April 17, 2020). Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Vertical Transmission in Neonates Born to Mothers With COVID-19 Pneumonia. Obstetrics and Gynecology. Pre-print downloaded Apr 27 from <https://www.ncbi.nlm.nih.gov/pubmed/32332320>

Clinical Characteristics and Health Care Setting

- This perspective aims to provide a practical support tool for the planning of delivery and neonatal resuscitation of infants born by mothers with suspected or confirmed COVID-19 infection.

Trevisanuto et al Neonatal Resuscitation Where the Mother Has a Suspected or Confirmed Novel Coronavirus (SARS-CoV-2) Infection: Suggestion for a Pragmatic Action. Neonatology: preprint downloaded April 24 from <https://doi.org/10.1159/000507935>

- Vera et al tracked 21 healthcare worker contacts of an initially undiagnosed COVID-19 case who were without PPE, including facemasks. All healthcare workers tested negative 7 days after initial index case contact. The team found a low risk of SARS-CoV-2 transmission in a primary care setting, and concluded that the current protective measures for healthcare workers, including strict adherence to basic standard hygiene and facemasks, offer considerable protection during short periods of contact with symptomatic COVID-19 cases.

Vera et al. (April 25 2020). Transmission risk of SARS-CoV-2 to healthcare workers – observational results of a primary care hospital contact tracing. Swiss Med Wkly. Pre-print downloaded Apr 27 from <https://doi.org/10.4414/smw.2020.20257>

Modelling and Prediction

- This new extended epidemic SEIR model quantifies distinct measures by comparing several suppression approaches and potential exit strategies that may be used during lockdown to revive the economy while keeping the pandemic under control.
- The authors conclude that; while rapid and strong lock-down is an effective pandemic suppression measure, a combination of other strategies such as social distancing, active protection and removal can achieve similar suppression synergistically. This quantitative approach is useful in supporting the establishment of mid- and long-term interventions. The paper also provides an interactive online tool that researchers and decision makers can use to simulate diverse scenarios.

Proverbio et al. (April 25, 2020). Assessing suppression strategies against epidemic outbreaks like COVID-19: the SPQEIR model. Pre-print downloaded April 27 from: <https://doi.org/10.1101/2020.04.22.20075804>

- SARS-CoV2 test shortages preclude implementation of a robust surveillance system in the US. Mirza et al. used the derivative influenza-negative influenza-like illness (fnILI) z-score from the CDC as a proxy for incident cases and disease-specific deaths to determine the burden of disease. They report that, for every unit increase of fnILI z-score, the number of cases increased by 70.2 and number of deaths increased by 2.1. They conclude that fnILI data may serve as an accurate outcome measurement to track the spread of the SARS-CoV-2, and may allow for informed and timely decision-making on public health interventions.

Mirza et al. (April 27 2020). *Influenza-Negative Influenza-Like Illness (fnLI) Z-Score 1 as a Proxy for Incidence and Mortality of COVID-19*. Preprint downloaded April 27 from <https://doi.org/10.1101/2020.04.22.20075770>

Public Health Policy and Practice

- Randazzo et al used RTqPCR for SARS-CoV-2 detection in a series of longitudinal wastewater samples collected during the earliest stages of the epidemic in Valencia, Spain. The team consistently detected SARS-CoV-2 RNA in samples taken when cases in that region were only incipient. They note that wastewater viral RNA context increased rapidly and anticipated the subsequent ascent in the number of declared cases. They conclude that wastewater analysis is a sensitive and cost-effective strategy for COVID-19 epidemiological surveillance of community transmission and significantly improves PH preparedness against new or re-occurring viral outbreaks.
Randazzo et al. (April 23 2020). Metropolitan Wastewater Analysis for COVID-19 Epidemiological Surveillance. Preprint downloaded April 27 from <https://doi.org/10.1101/2020.04.23.20076679>
- Wessel et al have created an interactive online dashboard for tracking COVID-19 outbreaks in U.S. counties, cities, and states in real time. It uses R Shiny application to aggregate data from multiple resources that track COVID-19 and visualizes them through an interactive, online dashboard. It displays COVID-19 data from every county and 188 metropolitan areas in the U.S. The web resource, called the COVID-19 Watcher, can be accessed at <https://covid19watcher.research.cchmc.org/>
Wessel et al. (April 25 2020). An Interactive Online Dashboard for Tracking COVID-19 in U.S. Counties, Cities, and States in Real Time. *Journal of the American Medical Informatics Association* print downloaded April 27 from: <https://doi.org/10.1093/jamia/ocaa071>
- Kim and Paul studied the characteristics of automated contact tracing and its effectiveness for mapping the spread of SARS-CoV-2. They highlight the infrastructure and social structures required for automated contact tracing to work, and further display vulnerabilities of the strategy to sufficiently determine significant contact with infected individuals. They conclude that a strong reliance on contact tracing to contain the spread of the SARS-CoV-2 pandemic can lead to the potential danger of allowing the pandemic to spread unchecked.
Kim and Paul. (April 22, 2020). Contact Tracing: a game of big numbers in the time of COVID-19. Preprint download Apr 27 from: <https://doi.org/10.1101/2020.04.22.20071043>

Other Resources and Commentaries

- [A real-time dashboard of clinical trials for COVID-19](#) – Lancet (Apr 24)
- [Notes from the field: The Impact of COVID-19 on Syringe Services Programs in the United States](#) –AIDS and Behavior (Apr 24)
- [Rapid Deployment of a Drive-Through Prenatal Care Model in Response to the Coronavirus Disease 2019 \(COVID-19\) Pandemic](#)- Obstet Gynecol (Apr 24)
- [SARS-Cov-2 \(human\) and COVID-19: Primer 2020](#) – Hepatology International (Apr)