



2019-nCoV Literature Situation Report (Lit Rep)

March 9, 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

- ② **The effectiveness of non-pharmaceutical interventions depends on a number of factors, including public health capacity for intervention implementation and enforcement, disease serial interval, and the level of pre-symptomatic transmission.**
- ② **A new study suggests that non-pharmaceutical interventions in the COVID-19 outbreak in Wuhan, China, effectively reduced the reproductive number from 3.86 to 0.32. Researchers estimate that these interventions may have prevented up to 94.5% of new cases that would have occurred prior to Feb 18 in Wuhan.**
- ② **Researchers estimate that without the non-pharmaceutical interventions implemented in China in January 2020, the case counts of COVID-19 could have been up to 67 times higher than in current reports.**

Non-Pharmaceutical Interventions

- Peak et al examined the effectiveness of NPI on containing an outbreak of COVID-19. They found that with a short serial interval (4.8 days), individual quarantine can be an effective tool for outbreak containment in settings with high intervention implementation (at least 75% of infected contacts identified and quarantined). In areas where intervention performance is not as high, the ultimate burden on the public health system may be too large for contact tracing and individual quarantine to be as effective.
- Consideration should be given to serial interval, quantity of pre-symptomatic transmission, public health capacity, and other situational factors when deciding about contact tracing and quarantine procedures.
Peak et al. (Mar 8, 2020). Modeling the Comparative Impact of Individual Quarantine vs. Active Monitoring of Contacts for the Mitigation of COVID-19. Pre-print downloaded Mar 9 from <https://doi.org/10.1101/2020.03.05.20031088>
- Xia et al report that transmission of COVID-9 may occur among close contacts during the incubation period, which may lead to a quarantine loophole. They suggest strong and effective countermeasures be implemented to prevent or mitigate asymptomatic transmission during the incubation period in populations at high risk.

Li et al. (Mar 8, 2020). Transmission of corona virus disease 2019 during the incubation period may lead to a quarantine loophole. Pre-print downloaded Mar 9 from <https://doi.org/10.1101/2020.03.06.20031955>

- The apparent early success in China's large-scale intervention to control the COVID-19 epidemic has led to interest in whether other countries can replicate it. In their paper, Lauro et al studied the impact of a single short-term intervention on an epidemic and offer insight into how best to time an intervention whose impact on society is too great maintain.

Lauro et al. (Mar 6, 2020). The timing of one-shot interventions for epidemic control. Pre-print downloaded Mar 9 from <https://doi.org/10.1101/2020.03.02.20030007>

- Wang et al compared epidemiological characteristics across periods and different demographic groups using data on 25,961 laboratory-confirmed COVID-19 cases. They used SEIR model to study the epidemic and evaluate the impact of non-pharmaceutical interventions. With interventions, the effective reproductive number dropped from 3.86 to 0.32 and was estimated to prevent 94.5% infections until February 18. They found that at least 59% of infected cases were unascertained in Wuhan, potentially including asymptomatic and mild-symptomatic cases.

Wang et al. (Mar 6, 2020). Evolving Epidemiology and Impact of Non-pharmaceutical Interventions on the Outbreak of Coronavirus Disease 2019 in Wuhan, China. Pre-print downloaded Mar 9 from <https://doi.org/10.1101/2020.03.03.20030593>

Transmission

- Much still remains unknown about the natural history of the disease. There is need to get insights into mobility-mediated transmission dynamics and its potential use in the containment of the epidemic. Aleta and Moreno using data-driven modelling, studied limiting mobility as containment strategies that could be implemented to stop large-scale spreading of the disease.

Aleta and Moreno (Mar 1, 2020). Evaluation of the incidence of COVID-19 and of the efficacy of contention measures in Spain: a data-driven approach. Pre-print downloaded Mar 9 from <https://doi.org/10.1101/2020.03.01.20029801>

- Baker et al used data from Bureau of Labor Statistics to estimate the burden of US workers exposed to infection and disease in the workplace. They report that up to 10% (14.4 M) and 18% (26.7M) of Americans are employed in occupations where exposure to disease or infection occurs at least once per week and month, respectively. These results can inform workplace safety preparations for COVID-19.

Baer et al. (Mar 6, 2020). Estimating the burden of United States workers exposed to infection or disease: a key factor in containing risk of COVID-19 infection. Pre-print downloaded Mar 6 from <https://doi.org/10.1101/2020.03.02.20030288>

- Henry et al used crowdsourced data to perform a preliminary epidemiologic analysis of pediatric patients with COVID-19. They reported higher incidence in males (52.4%) than females (32.9%). They present a descriptive analysis of pediatric cases, presenting symptom onset, time to medical care and clinical symptoms, ages most affected, and percentage noted to have infected a family member.

Henry et al. (Mar 9, 2020). Preliminary epidemiological analysis on children and adolescents with novel coronavirus disease 2019 outside Hubei Province, China: an observational study utilizing

crowdsourced data. Pre-print downloaded Mar 9 from
<https://doi.org/10.1101/2020.03.01.20029884>

- Kraemer and team used real-time human mobility data from Wuhan and detailed case data including travel history to predict the spread and growth rate of epidemics in China. They state that the spread of COVID-19 in China was driven by human mobility out of Wuhan early on and mitigated substantially by drastic control measures implemented since the end of January.

Kraemer et al. (March 6, 2020). The effect of human mobility and control measures on the COVID-19 epidemic in China. Pre-print downloaded Mar 9 from
<https://doi.org/10.1101/2020.03.02.20026708>.

Clinical Characteristics and Health Care Setting

- There are limited case series reporting impact of women affected by SARS-COV2. A few reports on SARS and MERS show a higher case fatality rate in pregnant women than COVID-19. Mullins et al, report on rapid review and expert consensus to guide management of women affected by COVID-19 during pregnancy.

Mullins et al. (Mar 8, 2020). Coronavirus in pregnancy and delivery: Rapid review and expert consensus. Pre-print downloaded Mar 9 from <https://doi.org/10.1101/2020.03.06.20032144>

- De Luca provides a timely reflection and criticism of a suggested plan by Wang et al (Feb 7, 2020) to handle neonates with SARS-CoV-2 infections and outbreaks in neonatal intensive care units (NICUs). She proposes alternative plans to the limitations identified.

De Luca (Mar 6, 2020). Managing neonates with respiratory failure due to SARS-CoV-2. Lancet Child Adolesc Health. Print downloaded Mar 9 from
[https://doi.org/10.1016/S23524642\(20\)30073-0](https://doi.org/10.1016/S23524642(20)30073-0)

Modelling and Prediction

- Lai et al used the SEIR model to estimate effectiveness of non-pharmaceutical interventions (NPI) for containing the COVID-19 outbreak in China. Their estimates were highly correlated with the reported incidence, and the authors report that without the NPI, the number of COVID-19 cases would likely have been around 67 times higher. The effectiveness of early detection and isolation of cases, travel restrictions, and social distancing intervention are discussed in details

Lai et al. (Mar 6, 2020). Effect of non-pharmaceutical interventions for containing the COVID-19 outbreak: an observational and modelling study. Pre-print downloaded Mar 9 from
<https://doi.org/10.1101/2020.03.03.20029843>

- Tapiwa et al and Tindale et al used outbreak data from clusters in Singapore and Tianjin, China to estimate the generation interval from symptom onset data, and estimated incubation periods and serial intervals, respectively. Tapiwa team examined patterns of pre-symptomatic transmission and reproduction number. Tindale et al determined the incubation period and serial interval distribution for transmission clusters in Singapore and in China. Both concluded that pre-symptomatic transmission of COVID-19 does occur. These modelling studies support intervention strategies.

Tapiwa et al. (Mar 8, 2020). Estimating the generation interval for COVID-19 based on symptom onset data. Pre-print downloaded Mar 9 from <https://doi.org/10.1101/2020.03.05.20031815>
Tindale et al. (Mar 6, 2020). Transmission interval estimates suggest pre-symptomatic spread of COVID-19. Pre-print downloaded Mar 9 from <https://doi.org/10.1101/2020.03.03.20029983>

Other Resources and Commentaries

- [How will country-based mitigation measures influence the course of the COVID-19 epidemic?](#) - The Lancet (Mar 9, 2020)
- [The Novel Coronavirus – A Snapshot of Current Knowledge.](#) - Microbial Biotechnology (Mar 6, 2020)
- [Are high-performing health systems resilient against the COVID-19 epidemic?](#) – The Lancet (Mar 6, 2020)