



2019-nCoV Literature Situation Report (Lit Rep) March 30, 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

- ☐ **Whilst COVID-19 is mild disease in children, data available to date suggests that children have not played a substantive role in intra-household transmission of SARS-CoV-2.**
- ☐ **There is further theoretical, experimental, preclinical and clinical evidence to support effectiveness of chloroquine in patients affected with COVID-19.**
- ☐ **Hydrogen peroxide vapor can be used to sterilize N95 respirators for reuse. Hydrogen peroxide vapor reprocessing may ease shortages and provide a higher filtration crisis alternative to non-NIOSH masks.**
- ☐ **Social distancing interventions can avert cases by 20% and hospitalizations and deaths by 90% as long as the intervention is kept in place**

Transmission

- Zhu et al investigated concerns that children could be an important source of SARS-CoV-2 in household transmission clusters. The observational study analyzed literature published on the clinical features of SARS-CoV-2 in children and household transmission clusters of SARS-CoV-2 in China, Singapore, South Korea, Japan, and Iran. Only 9.7% of clusters were identified as having a pediatric index case. They conclude that whilst SARS-CoV-2 can cause mild disease in children, the data to date suggests that children have not played a substantive role in the intra-household transmission of SARS-CoV-2.

Zhu et al. (Mar 30, 2020). Children are unlikely to have been the primary source of household SARS-CoV-2 infections. Preprint downloaded Mar 30 from

<https://doi.org/10.1101/2020.03.26.20044826>

Testing and Treatment

- Kapoor and Kapoor conducted a systematic review of 19 publications on the role of chloroquine and/or hydroxychloroquine in limiting the infection with SARS-CoV-2. They conclude that there is theoretical, experimental, preclinical and clinical evidence to support effectiveness of chloroquine in patients affected with COVID-19.
- They further report adequate evidence of drug safety from the long-time clinical use of chloroquine and hydroxychloroquine in other indications.

Kapoor and Kapoor (Mar 2020): Role of Chloroquine and Hydroxychloroquine in the Treatment of COVID-19 Infection- A Systematic Literature Review. Preprint downloaded Mar 30 from <https://doi.org/10.1101/2020.03.24.20042366>

Clinical Characteristics and Health Care Setting

- Chen et al. reviewed clinical records, laboratory results, and chest CT scans retrospectively for nine laboratory-confirmed COVID-19 pregnant women. Evidence of intrauterine vertical transmission was assessed by testing for the presence of SARS-CoV-2 in amniotic fluid, cord blood, and neonatal throat swab samples. Their findings further confirm earlier reports of no evidence of intrauterine infection caused by vertical transmission in women who develop COVID-19 pneumonia in late pregnancy.

Che et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records Lancet 2020; 395: 809–15: [https://doi.org/10.1016/S0140-6736\(20\)30360-3](https://doi.org/10.1016/S0140-6736(20)30360-3)

- Kenney et al evaluated the virucidal activity of hydrogen peroxide (HP) vapor to sterilize N95 respirators for reuse. A single HP vapor cycle resulted in complete eradication of phage from masks (limit of detection 10 PFU, lower than the infectious dose of the majority of respiratory viral pathogens). After 5 cycles, the respirators appeared similar to new with no deformity. HP vapor reprocessing may ease shortages and provide a higher filtration crisis alternative to non-NIOSH masks.

Kenney et al. (Mar 27, 2020). Hydrogen Peroxide Vapor sterilization of N95 respirators for reuse. Pre-print downloaded Mar 30th, 2020 from <https://doi.org/10.1101/2020.03.24.20041087>

Modelling and Prediction

- Dy and Rabajante formulated an infection risk model for frontline health care workers in health care facilities that handled COVID -19 patients. From their model, the following were cardinal to safety of the healthcare workers: maximum of three encounters per hour in a 12-hour work shift duration, reduction of each interaction with patients to less than 40 mins, practicing of social distancing, and provision of PPE among others. This model can be used for other scenarios, such as identifying infection risk in public transportation, educational settings, offices, and mass gatherings.

Dy and Rabajante. (Mar 27, 2020): A COVID-19 Infection Risk Model for Frontline Health Care Workers. Pre-print downloaded Mar 29 from <https://doi.org/10.1101/2020.03.27.20045336>

- Murray et al used data on confirmed COVID-19 deaths from WHO websites and local and national governments to develop a statistical model forecasting deaths and hospital utilization against capacity by state in the US over the next 4 months. The model predicts excess demand for up to 64,175 total beds, 17,309 ICU beds, and 19,481 ventilators at the peak of COVID-19 in the second week of April. A total of 81,114 deaths is expected in the US from COVID-19 over the same months and will drop thereafter below 10 deaths per day between May 31 and June 6.
- They predict that, even with social distancing measures enacted and sustained, the peak demand for hospital services will substantially exceed capacity. There is an urgent need to temporarily increase capacity of health facilities while implementing, enforcing, and maintaining these measures to mitigate hospital system overload and prevent deaths.

Murray et al. (Mar 25, 2020): Forecasting COVID-19 impact on hospital bed-days, ICU-days, ventilator days and deaths by US state in the next 4 months. IHME COVID-19 health service utilization forecasting team. Pre-print downloaded Mar 30 from

http://www.healthdata.org/sites/default/files/files/research_articles/2020/covid_paper_MED_RXIV-2020-043752v1-Murray.pdf

- Matrajt and Leung used a mathematical model to investigate the effectiveness of social distancing interventions lasting six weeks in a middle-sized city in the US. Their results suggest that social distancing interventions can avert cases by 20% and hospitalizations and deaths by 90% as long as the intervention is kept in place, but noted that the epidemic will rebound once the intervention is lifted. Social distancing interventions buy crucial time, but must occur in conjunction with testing and contact tracing of all suspected cases to mitigate transmission of SARS-CoV-2.

Matrajt and Leung. (Mar 27, 2020). Evaluating the effectiveness of social distancing interventions against. Pre-print downloaded Mar 30 from <https://doi.org/10.1101/2020.03.27.20044891>

Public Health Policy and Practice

- Jails in US pose unique challenge to COVID-19 prevention, detection, and mitigation that deserve immediate attention. Most common measures of prevention for the general public, are not feasible in the US jails because of overcrowding, institutional restrictions and lack of funding. Jails contain a high proportion of people with underlying health conditions, increasing risk of severe COVID-19 outcomes. Wurcel et al provide a list of recommendations to facilitate and augment COVID-19 mitigation policies in jails. They further recommend that authorities to come up with evidence-based approaches to contain the outbreak without further isolating an already vulnerable population.

Wurcel et al. (Mar 30, 2020). Spotlight on Jails: COVID-19 Mitigation Policies Needed Now. Preprint downloaded (Mar 30) from Clinical Infectious Disease. <https://doi.org/10.1093/cid/ciaa346>

Other Resources and Commentaries

- [Mental health considerations for children quarantined because of COVID-19](#) – Lancet Child Adolesc Health 2020 (Mar 2020)
- [There is still no evidence that dogs and cats could become sick or infect people](#) – Veterinary Record (Mar 2020)
- [A perspective on undocumented U.S. immigrants and obstacles in seeking health in Covid-19 Pandemic](#) - NEJM (Mar 2020)