



## 2019-nCoV Literature Situation Report (Lit Rep) July 28, 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

- **SARS-CoV-2 testing among household contacts of COVID-19 cases in Wisconsin and Utah found a 20% attack rate among contacts under age 18 years and 26% among those 18 years or older.** [More](#)
- **A UK modeling study using pre-existing contact and post-lockdown mobility data found that, in a scenario in which all children return to elementary school,  $R_0$  remains below 1 only if non-household contacts remain low or a high proportion of contacts can be traced and self-isolate.** [More](#)
- **Surveillance testing by RT-PCR of asymptomatic healthcare workers in greater Houston (March and April) found a SARS-CoV-2 prevalence of 5% among those from COVID-19 units versus 0.6% among those from non-COVID units.** [More](#)

### Transmission

- Out of 198 household contacts exposed to SARS-CoV-2 in Wisconsin and Utah and followed longitudinally (PCR two or more times during a 14 day period) from March 22 to April 22, 47 were positive by PCR, representing an attack rate of 24%. Among children under 18 years, the attack rate was 20%, versus 26% for adults 18 years or older. While symptom distribution varied by age, upper respiratory (68%) and neurological (64%) symptoms were the most common, while fever was not commonly reported (19%).  
*Yousaf et al. (July 2020). A Prospective Cohort Study in Non-Hospitalized Household Contacts with SARS-CoV-2 Infection: Symptom Profiles and Symptom Change over Time. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa1072>*
- A surveillance program among asymptomatic clinical and nonclinical workers at Houston Methodist (an academic medical center with 7 community hospitals), and expanded to asymptomatic community residents, found that out of 2,872 participants (March 11 to April 19) 4% tested positive for SARS-CoV-2 by RT-PCR, with all of the positive results being in clinical healthcare workers. Among clinical healthcare workers, prevalence was 5% (95% CI 4.5-6.5%) among those from COVID-19 units versus 0.6% (95% CI 0.2-1.7%) from non-COVID units.  
*Vahidy et al. (July 2020). Prevalence of SARS-CoV-2 Infection Among Asymptomatic Health Care Workers in the Greater Houston, Texas, Area. JAMA Network Open. <https://doi.org/10.1001/jamanetworkopen.2020.16451>*

- A modeling study indicated that an individual with COVID-19 who is coughing or breathing normally releases large numbers of viruses, but the estimated infectious risk from an individual with a typical viral load in a space the size of a medical exam room was low. Riediker and Tsai simulated the release of viruses from individuals with asymptomatic to moderate COVID-19 infection during normal breathing and while coughing. Viral loads across different droplet sizes produced under various conditions were derived from literature. The authors applied a compartmental model to estimate virus load in a perfectly mixed 50m<sup>3</sup> room with one individual as the source, assuming a virus half-life of 1.1 hours, under normal breathing and with coughing every 30 seconds. Concentration plateaued in higher ventilation settings (10 exchanges/hour) after 30 minutes, versus 70 minutes in lower ventilation settings (3 exchanges/hour).

*Riediker and Tsai. (July 2020). Estimation of Viral Aerosol Emissions From Simulated Individuals With Asymptomatic to Moderate Coronavirus Disease 2019. JAMA Network Open.*

<https://doi.org/10.1001/jamanetworkopen.2020.13807>

### Clinical Characteristics and Health Care Setting

- A meta-analysis (14 studies and 371 patients) of COVID-19 in children found that 17% (95% CI 9-27) are asymptomatic (fever is the most common symptom), 67% (95%CI 51-81) were diagnosed with pneumonia, and incidence of severe or critical illness is close to 0% (95% CI 0-1). Of those diagnosed with pneumonia, 54% (95%CI 38-69) had ground-glass opacities detected on CT scan. An additional 19% were asymptomatic but had radiological features of pneumonia. Most of the included studies were case reports or case series from China. The authors also note this meta-analysis found a higher proportion of asymptomatic children than most studies from the US and Europe, which may reflect differences in testing policies.

*Ding et al. (2020). Clinical Characteristics of Children With COVID-19: A Meta-Analysis. Frontiers in Pediatrics.* <https://doi.org/10.3389/fped.2020.00431>

- A study of 949 adult patients testing positive for COVID-19 at a university medical center (February 1 to April 3) found that 21% reported loss of smell during their initial evaluation. Loss of smell was associated with younger age (mean age 46 with smell loss vs 49 without), female gender (65% vs 53%), and higher BMI (mean 33.6 vs 31.5). Smell loss was also significantly associated with history of pre-existing smell dysfunction (OR=4.7), allergic rhinitis (OR=1.8) and chronic rhinosinusitis (OR=3.7).
- Smell loss was significantly associated with decreased risk of hospitalization (OR=0.7), ICU admission (OR=0.38), intubation (OR=0.4), and ARDS (OR=0.5) after adjusting for demographics, BMI, allergic rhinitis, and chronic rhinosinusitis.

*Foster et al. (July 2020). Smell Loss Is a Prognostic Factor for Lower Severity of COVID-19. Annals of Allergy, Asthma & Immunology.* <https://doi.org/10.1016/j.anai.2020.07.023>

- Jary et al report on the genomic diversity of SARS-CoV-2 in longitudinal samples (n=7) collected from a single patient in Paris with mild symptoms early in the course of the COVID-19 pandemic. Majority consensus sequences were identical in five out of seven samples, differing from the Wuhan reference sequence by one synonymous mutation. Over two hundred minority variants were detected (median of 38 per sample), with four variants shared by different samples. Over half of mutations had moderate or high impact on gene expression, and variants differed between lower and upper respiratory tract samples collected on the same day. The authors suggest these results provide evidence of SARS-CoV-2 quasispecies that vary day-to-day and between anatomical sites.

*Jary et al. (July 2020). Evolution of Viral Quasispecies during SARS-CoV-2 Infection. Clinical Microbiology and Infection.* <https://doi.org/10.1016/j.cmi.2020.07.032>

## Mental Health and Personal Impact

- Results of a Children’s Sleep Habit Questionnaire administered to 1,619 caregivers of preschoolers (4-6 years) in China during the COVID-19 pandemic, compared with a sociodemographically similar sample in 2018, found later bedtimes and wake times during the pandemic period, longer nocturnal and shorter nap sleep durations, comparable 24-hr sleep duration, and fewer caregiver-reported sleep disturbances.

*Liu et al. (July 2020). Sleep of Preschoolers during the Coronavirus Disease 2019 (COVID-19) Outbreak. Journal of Sleep Research. <https://doi.org/10.1111/jsr.13142>*

## Modeling and Prediction

- *[pre-print, not peer-reviewed]* Using UK social contact data collected in 2010 and Google mobility report data pre- and post-lockdown, Brooks-Pollock et al. estimated an age-adjusted  $R_0$  for COVID-19 and relative change in  $R_0$  in scenarios including school closures, work closures, and contact tracing. They found that a 65% reduction in work contacts, a 75% reduction in leisure contacts, and a 95% reduction in school contacts reduces  $R_0$  to 0.7 (95% CI 0.6, 0.8), versus 0.45 (95% CI 0.41, 0.50) when all non-household contacts were eliminated. A scenario in which all children are back at elementary school resulted in an  $R_0$  that remains below 1 only if non-household contacts remain low, or if a high proportion of contacts can be traced and self-isolate.

*Brooks-Pollock et al. (July 27, 2020). Using Social Contact Data to Predict and Compare the Impact of Social Distancing Policies with Implications for School Re-Opening. Preprint downloaded on July 28 from <https://doi.org/10.1101/2020.07.25.20156471>*

## Public Health Policy and Practice

- An assessment of COVID-19-related studies registered on ClinicalTrials.gov found that only 29% would have the potential to result in the highest level of individual study evidence (Oxford Centre for Evidence [OCEBM] level 2). Pundi et al. report on COVID-19-related studies registered on ClinicalTrials.gov as of May 19, 2020, excluding withdrawn, suspended, terminated, or expanded-access studies (n=1,551 studies, 911 interventional). Primary outcome pertained to clinical course, including mortality (33%), ventilation requirement (27%), and treatment complications (23%). Of the 664 RCTs, blinding was reported for 55%, placebo control for 29%, planned enrollment of more than 100 participants for 36%, and two or more study centers for 17%.

*Pundi et al. (July 27, 2020). Characteristics and Strength of Evidence of COVID-19 Studies Registered on ClinicalTrials.Gov. JAMA Internal Medicine. <https://doi.org/10.1001/jamainternmed.2020.2904>*

## Other Resources and Commentaries

- [Automated EHR Score to Predict COVID-19 Outcomes at US Department of Veterans Affairs](#) – PloS One
- [Need for Sustainable Biobanking Networks for COVID-19 and Other Diseases of Epidemic Potential](#) – The Lancet Infectious Diseases (July 24)
- [University Students’ Changes in Mental Health Status and Determinants of Behavior during the COVID-19 Lockdown in Greece](#) – Psychiatry Research (July)
- [Covid-19 and the Cardiovascular System: A Comprehensive Review](#) – Journal of Human Hypertension (July 27)

- [Potential Anti-COVID-19 Therapeutics That Block the Early Stage of the Viral Life Cycle: Structures, Mechanisms, and Clinical Trials](#) – International Journal of Molecular Sciences (July 21)
- [SARS-CoV-2 Detection in Different Respiratory Sites: A Systematic Review and Meta-Analysis](#) – EBioMedicine (July 24)
- [Maryland’s Experience With the COVID-19 Surge: What Worked, What Didn’t, What Next?](#) – The American Journal of Bioethics (July 2)
- [Effects of Non-Pharmaceutical Interventions on COVID-19 A Tale of Two Models](#) – medRxiv (July 27)
- [SARS-CoV-2 Viral Load Dynamics Duration of Viral Shedding and Infectiousness a Living Systematic Review and Meta-Analysis](#) – medRxiv (July 28)
- [FDA Approved Drugs with Pharmacotherapeutic Potential for SARS-CoV-2 \(COVID-19\) Therapy](#) – Drug Resistance Updates (July)
- [Using a Public Health Ethics Framework to Unpick Discrimination in COVID-19 Responses](#) – The American Journal of Bioethics (July 27)
- [From “Coffin Dodger” to “Boomer Remover:” Outbreaks of Ageism in Three Countries with Divergent Approaches to Coronavirus Control](#) – The Journals of Gerontology (July 28)
- [Latinx Health Disparities Research During COVID-19: Challenges and Innovations](#) – Annals of Behavioral Medicine (July 27)
- [Assessing the Extent of SARS-CoV-2 Circulation through Serological Studies](#)– Nature Medicine (July 27)
- [People With Disabilities in COVID-19: Fixing Our Priorities](#) – The American Journal of Bioethics (July 2)
- [Occupational Health: A Key to the Control of COVID-19 in Correctional Facilities](#) – Annals of Internal Medicine (July 27)
- [The Actual and Potential Impact of the Novel 2019 Coronavirus on Pediatric Rehabilitation: A Commentary and Review of Its Effects and Potential Disparate Influence on Black, Latinx and Native American Marginalized Populations in the United States](#) – Journal of Pediatric Rehabilitation Medicine (July )
- [Illness-Related Work Absence in Mid-April Was Highest on Record](#) – JAMA Internal Medicine (July 27)
- [The North American Layman’s Understanding of COVID-19: Are We Doing Enough?](#) – Frontiers in Public Health (July 3, 2020)

*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*