



## 2019-nCoV Literature Situation Report (Lit Rep)

June 17, 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

- **High-resolution spatiotemporal approaches may provide an alternative to digital contact tracing for cluster detection and monitoring, potentially reducing privacy concerns.** [More](#)
- **A county-level analysis found COVID-19 case trends significantly declined after states implemented face mask mandates, compared to counties in states without such mandates.** [More](#)
- **A population-based survey in San Francisco found Latinx residents were significantly more likely to be currently or previously infected with SARS-CoV-2 than non-Latinx residents.** [More](#)
- **Recovered COVID-19 cases who tested positive by PCR after previously testing negative did not appear to be infectious, based on negative viral cultures and evidence of degradation of the viral genomes.** [More](#)
- **Mathematical modeling using UK data found case isolation and contact tracing would be unlikely to control the pandemic without moderate social distancing.** [More](#)

### Non-Pharmaceutical Interventions

- De Ridder et al. analyzed the daily geographical clustering dynamics of confirmed COVID-19 cases in Geneva, Switzerland and found no clusters form within the first 8 days of detection of the first positive patient—indicating a window in which transmission to neighbors can be curbed—and that the first clusters emerged in areas of high population density. The authors propose use of their approach as an alternative to digital contact tracing to reduce privacy concerns.

*De Ridder et al. (June 2020). Geospatial Digital Monitoring of COVID-19 Cases at High Spatiotemporal Resolution. The Lancet Digital Health. [https://doi.org/10.1016/S2589-7500\(20\)30139-4](https://doi.org/10.1016/S2589-7500(20)30139-4)*

- A comparison of COVID-19 case trends between US counties (n=2,930) found small differences in case trends comparing between counties with and without face mask mandates before the implementation of the mandate and larger and statistically significant differences in counties after they implemented face mask mandates. Compared to counties that did not implement a face mask mandate, daily case rates declined by 0.9% within 5 days post-mandate and reached a 2% decrease by 21 days post-mandate.

*Lyu and Wehby. (June 2020). Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US. Health Affairs. <https://doi.org/10.1377/hlthaff.2020.00818>*



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## Transmission

- [pre-print, not peer reviewed] One out of 64 (2%) serial breastmilk samples from 18 SARS-CoV-2 infected women (1 asymptomatic) in the US was positive for SARS-CoV-2 by RT-PCR. The positive sample was collected on the day of symptom onset. Samples 2 days prior and 12 and 14 days later were negative and viral culture of the positive sample was negative. In a separate analysis, replication-competent virus was added to breastmilk from uninfected women. After Holder pasteurization, a process commonly performed by donor milk banks, these samples were all RT-PCR negative. These results provide some evidence that transmission of SARS-CoV-2 via breastmilk is unlikely either directly from a nursing mother or via donor milk that has been pasteurized.  
*Chambers et al. (June 16, 2020). Evaluation of SARS-CoV-2 in Breastmilk from 18 Infected Women. Pre-print downloaded June 17 from <https://doi.org/10.1101/2020.06.12.20127944>*
- [pre-print, not peer reviewed] All residents and non-residents who work in a densely-populated, majority Latinx San Francisco community were offered SARS-CoV-2 RT-PCR testing (2,598 of 5,174 residents and 1,355 non-resident workers were tested). The estimated SARS-CoV-2 prevalence among residents was 4% among Latinx vs 0.2% among non-Latinx, while estimated prevalence among workers was 10% for Latinx and 0% for non-Latinx workers. Twenty-nine percent of PCR-positive participants remained asymptomatic after two weeks of follow-up. The estimated seroprevalence of SARS-CoV-2 antibodies was 3% among residents and 8% among workers, and estimated cumulative incidence (antibody or PCR positive) was 6%. Phylogenetic analysis detected representatives from five globally circulating clades, suggesting multiple independent introductions.  
*Chamie et al. (June 17, 2020). SARS-CoV-2 Community Transmission During Shelter-in-Place in San Francisco. Pre-print downloaded June 17 from <https://doi.org/10.1101/2020.06.15.20132233>*
- An analysis of all children (n=314) from families with SARS-CoV-2 infected members in Zhejiang Province, China found incidence in children who were close contacts was significantly lower than in adults who were close contacts (13% vs 21%). Among 43 pediatric cases, the mean age was 8.2 years and mean incubation was 9.1 days, 77% had mild pneumonia and the remainder were asymptomatic. While SARS-CoV-2 RNA could be detected in stool samples in 91% of cases and for over 70 days in some children, no family contacts of these children were subsequently infected.  
*Hua et al. (June 2020). Epidemiological Features and Viral Shedding in Children with SARS-CoV-2 Infection. Journal of Medical Virology. <https://doi.org/10.1002/jmv.26180>*
- Of 147 initially asymptomatic individuals with SARS-CoV-2 infection in Anhui Province, China, 11% developed illness during a 14 day isolation period. The secondary attack rate was 10% for the pre-symptomatic carriers, versus 3% for the asymptomatic carriers.  
*Liu et al. (June 2020). The Assessment of Transmission Efficiency and Latent Infection Period on Asymptomatic Carriers of SARS-CoV-2 Infection. International Journal of Infectious Diseases. <https://doi.org/10.1016/j.ijid.2020.06.036>*
- Testing of high-touch surfaces (e.g. mobile phone, door handle) in an isolation room of an asymptomatic pediatric patient positive for SARS-CoV-2 found no evidence of environmental contamination. The patient had been diagnosed 41 days prior to sampling, but remained PCR positive without decrease in viral titer. The most recent cleaning of the environment was 4 days prior. These results give some indication that environmental contamination by asymptomatic

carriers may be limited; however these results are based on a single case and may have been affected by the long interval between diagnosis of the case and sampling of the environment.

*Shin et al. (June 2020). Environmental Surface Testing for Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) during Prolonged Isolation of an Asymptomatic Carrier. Infection Control and Hospital Epidemiology. <https://doi.org/10.1017/ice.2020.300>*

## Testing and Treatment

- Antibodies isolated from three convalescent COVID-19 patients were found to have strong neutralizing activity against SARS-CoV-2. Further analysis revealed several sites on the SARS-CoV-2 spike protein that could be targeted for vaccine development.

*Brouwer et al. (June 2020). Potent Neutralizing Antibodies from COVID-19 Patients Define Multiple Targets of Vulnerability. Science. <https://doi.org/10.1126/science.abc5902>*

- Paired oropharyngeal/nares (OP/Na) and nasopharyngeal (NP) samples were collected from 190 individuals with suspected COVID-19, of whom 36 were positive by at least one molecular method. There was high concordance of results between OP/Na and NP samples, with the greatest discordance observed in those individuals with low viral concentrations.

*LeBlanc et al. (July 2020). A Combined Oropharyngeal/Nares Swab Is a Suitable Alternative to Nasopharyngeal Swabs for the Detection of SARS-CoV-2. Journal of Clinical Virology. <https://doi.org/10.1016/j.jcv.2020.104442>*

## Clinical Characteristics and Health Care Setting

- A scoping review of the accuracy of diagnostic approaches for COVID-19 in emergency department settings included 87 studies through May 5, 2020. The review concluded that report of fever and loss of smell and taste were the most helpful features to distinguish COVID-19 patients from those with similar illnesses and that a low white blood cell count is the most common lab abnormality. Sensitivity of testing by rRT-PCR in the emergency department was 60%-78%.
- CT scanning may increase the sensitivity of rRT-PCR prior to seroconversion, but guidelines to identify patients most likely to benefit from CT scanning are still emerging.
- The authors report that current studies do not adhere to accepted diagnostic accuracy reporting standards and anticipate significantly biased results if the same tests were applied to emergency department patients with suspected COVID-19.

*Carpenter et al. (June 2020). Diagnosing COVID-19 in the Emergency Department: A Scoping Review of Clinical Exam, Labs, Imaging Accuracy and Biases. Academic Emergency Medicine. <https://doi.org/10.1111/acem.14048>*

- Joshi et al. built a predictive tool for identifying SARS-CoV-2 PCR-negative emergency department patients based on sex and components of a complete blood count (a routinely-conducted test). Across a range of specificities, they found the average negative predictive value (NPV) to be 98% when validated on a northern California sample (41 positive, 495 negative). Applying the Northern California-defined threshold to samples of patients from Seattle, Washington, Chicago, Illinois, and South Korea, NPV was between 92-99% and sensitivity was 85-89%. By restricting PCR testing to predicted positive patients, the tool allowed a 33% increase in properly allocated resources.

*Joshi et al. (June 2020). A Predictive Tool for Identification of SARS-CoV-2 PCR-Negative Emergency Department Patients Using Routine Test Results. Journal of Clinical Virology. <https://doi.org/10.1016/j.jcv.2020.104502>*

- An analysis of 220 hospitalized and 311 non-hospitalized COVID-19 patients in Atlanta found older age, black race, diabetes, lack of insurance, male sex, smoking, and obesity were independently associated with hospitalization.  
*Killerby et al. (June 17, 2020). Characteristics Associated with Hospitalization Among Patients with COVID-19 — Metropolitan Atlanta, Georgia, March–April 2020. MMWR. Morbidity and Mortality Weekly Report. <https://doi.org/10.15585/mmwr.mm6925e1>*
- *[pre-print, not peer reviewed]* Among 619 discharged COVID-19 cases in Guandong, China, where two consecutive negative tests are required before discharge and all discharged cases are isolated in designated hotels and sampled at a minimum of 7 and 14 days after discharge, 87 tested positive by RT-PCR during isolation. These individuals had robust antibody response and were negative on viral culture and evidence of degradation of the virus genome was detected, suggesting transmission from these individuals is unlikely.  
*Lu et al. (June 17, 2020). Clinical Immunological and Virological Characterization of COVID-19 Patients That Test Re-Positive for SARS-CoV-2 by RT-PCR. Pre-print downloaded June 17 from <https://doi.org/10.1101/2020.06.15.20131748>*
- Among 394 patients positive for SARS-CoV-2 by PCR in five tertiary care hospitals in Europe and China, 41% reported disorders of taste or smell, with higher prevalence in the European cohorts than the Chinese cohort. Additionally, 10% reported disorders of taste or smell as their only COVID-19 symptoms, and 19% reported these symptoms preceded their other symptoms.  
*Qiu et al. (June 2020). Olfactory and Gustatory Dysfunction as an Early Identifier of COVID-19 in Adults and Children: An International Multicenter Study. Otolaryngology--Head and Neck Surgery. <https://doi.org/10.1177/0194599820934376>*

## Modeling and Prediction

- A mathematical model that stratified individual-level transmission by setting (household, work, school, or other) and used BBC pandemic data from over 40,000 UK participants found that a high proportion of cases would need to self-isolate and a high proportion of their contacts would need to be traced to halt the epidemic, in the absence of other measures. These measures would be more likely to achieve control if combined with moderate physical distancing.  
*Kucharski et al. (June 2020). Effectiveness of Isolation, Testing, Contact Tracing, and Physical Distancing on Reducing Transmission of SARS-CoV-2 in Different Settings. The Lancet Infectious Diseases. [https://doi.org/10.1016/S1473-3099\(20\)30457-6](https://doi.org/10.1016/S1473-3099(20)30457-6)*

## Other Resources and Commentaries

- [Antibody cocktail to SARS-CoV-2 spike protein prevents rapid mutational escape seen with individual antibodies](#) – Science (June 15)
- [The solitary confinement of incarcerated American youth during COVID-19](#) – Elsevier Public Health Emergency Collection (June 10)
- [COVID-19 in patients with thoracic malignancies \(TERAVOLT\): first results of an international, registry-based, cohort study](#) – Lancet Oncology (June 12)
- [COVID-19 and the other pandemic: populations made vulnerable by systemic inequity](#) – Nature Reviews Gastroenterology & Hepatology (June 15)

- [Studies in humanized mice and convalescent humans yield a SARS-CoV-2 antibody cocktail](#) – Science (June 15)
- [Can a toilet promote virus transmission? From a fluid dynamics perspective](#) – Physics of Fluid (June 16)
- [Protecting the Health of Vulnerable Children and Adolescents During COVID-19–Related K-12 School Closures in the US](#) – JAMA Health Forum (June 16)
- [The effects of social deprivation on adolescent development and mental health](#) – Lancet Child & Adolescent Health (June 12)
- [Isolation of potent SARS-CoV-2 neutralizing antibodies and protection from disease in a small animal model](#) – Science (June 15)
- [Preventing COVID-19 Transmission on Labor and Delivery: A Decision Analysis](#) – American Journal of Perinatology
- [COVID-19 vaccine development: Time to consider SARS-CoV-2 challenge studies?](#) – Vaccine (June 4)
- [Biobanks could identify medically actionable findings relevant for COVID-19 clinical care](#) – Nature Medicine (June 15)
- [Clinical characteristics of COVID-19 in 104 people with SARS-CoV-2 infection on the Diamond Princess cruise ship: a retrospective analysis](#) – Lancet Infectious Diseases (June 12)
- [Effect of extended use N95 respirators and eye protection on personal protective equipment \(PPE\) utilization during SARS-CoV-2 outbreak in Singapore](#) – Antimicrobial Resistance & Infection Control (June 15)
- [Broad neutralization of SARS-related viruses by human monoclonal antibodies](#) – Science (June 15)

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