



2019-nCoV Literature Situation Report (Lit Rep)

June 24, 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

- **A college spring break trip resulted in SARS-CoV-2 infection in 60 (28%) college-aged travelers and their contacts included in the outbreak investigation, one-fifth of whom were asymptomatic at the time of testing.** [More](#)
- **Mathematical modeling suggests that lockdowns should remain in place for a minimum of 60 days, followed by a gradual reintroduction of the workforce. The model indicates that physical distancing, face masks, and other individual protection measures had a massive impact on reducing the current peak of active cases. Notably, waning adherence to these interventions over time could result in a larger second epidemic wave.** [More](#)
- **A large proportion of nursing home residents (24%) and staff (15%) tested positive for SAR-CoV-2 in Spain, the majority of whom were asymptomatic at the time of testing (70% and 56% of residents and staff, respectively).** [More](#)
- **Recovered COVID-19 patients commonly experience persistent SARS-CoV-2 positivity and fluctuating RT-PCR test results: 47% of hospitalized patients still tested positive at symptom resolution, 14% tested positive 14-days following hospital discharge and 91% of patients who tested negative had a subsequent positive test result when retested within the first month of being discharged.** [More](#)

Transmission

- Transmission of SARS-CoV-2 during and after a college spring break trip to Cabo San Lucas, Mexico (March 14–19) led to 64 cases, including 60 cases among 183 vacation travelers, one among 13 household contacts, and three among 35 community contacts. Approximately one-fifth of those who tested positive were asymptomatic at the time of testing.
- Prompt epidemiologic investigation, with effective contact tracing and cooperation between a university and a public health department, contributed to the control of the outbreak.
Lewis et al. (June 24, 2020). COVID-19 Outbreak Among College Students After a Spring Break Trip to Mexico — Austin, Texas, March 26–April 5, 2020. MMWR. Morbidity and Mortality Weekly Report. <https://doi.org/10.15585/mmwr.mm6926e1>
- Silverman et. al use outpatient surveillance data for influenza-like illness to estimate the prevalence of SARS-CoV-2 in the US. Assuming that one third of all people infected with SARS-CoV-2 sought care, the authors estimated that a surge of influenza-like illness corresponded to over 8.7 million new SARS-CoV-2 infections across the US between March 8-28, 2020, which is substantially more

than the number of infections that were detected. The authors also estimated that the early US epidemic doubled in size at least every 4 days, and that over 80% of cases were undetected.

Silverman et al. (June 22, 2020). Using Influenza Surveillance Networks to Estimate State-Specific Prevalence of SARS-CoV-2 in the United States. Science Translational Medicine.

<https://doi.org/10.1126/scitranslmed.abc1126>

- Residents and staff at 69 nursing homes in Spain were screened for SARS-CoV-2 between April 10-24, 2020. Twenty-four percent (768/3214) of residents and 15% (403/2655) of staff tested positive. Among those who tested positive, 70% of residents and 56% of staff were asymptomatic at the time of testing.

Borras-Bermejo et al. (June 23, 2020). Asymptomatic SARS-CoV-2 Infection in Nursing Homes, Barcelona, Spain, April 2020. Emerging Infectious Diseases.

<https://doi.org/10.3201/eid2609.202603>

- Cento et al. found that 47% (235/501) of hospitalized COVID-19 patients still tested positive at symptom resolution. Among patients who were discharged, 14% (976/7127) still tested positive 14-days after hospital discharge. In addition, among patients who were retested following their first negative RT-PCR test result, 91% (196/264) tested positive again within the first month of discharge.

Cento et al. (June 11, 2020). Persistent Positivity and Fluctuations of SARS-CoV-2 RNA in Clinically-Recovered COVID-19 Patients. Journal of Infection.

<https://doi.org/10.1016/j.jinf.2020.06.024>

- Schmitt et al. found genomic evidence that several species of savanna monkey (*Chlorocebus spp.*) are likely as susceptible to SARS-CoV-2 infection as humans. These findings suggest they may be a promising animal model for SARS-CoV-2 infection for vaccine and therapy development as well as the potential for bi-directional zoonotic transfer in savanna monkey populations. This may have further implications of epidemic control in communities with frequent human/non-human primate interactions.

Schmitt et al. (June 23, 2020). ACE2 and TMPRSS2 Variation in Savanna Monkeys (Chlorocebus Spp.): Potential Risk for Zoonotic/Anthroponotic Transmission of SARS-CoV-2 and a Potential Model for Functional Studies. PloS One.

<https://doi.org/10.1371/journal.pone.0235106>

Testing and Treatment

- Respi-Strip is an immunochromatographic (ICT) assay for the rapid detection of SARS-CoV-2 antigen on nasopharyngeal specimens that provides diagnostic results within 15 minutes. When validated against RT-PCR tests (n=328), the assay had low sensitivity (57.6%) and high specificity (99.5%).

Mertens et al. (May 8, 2020). Development and Potential Usefulness of the COVID-19 Ag Respi-Strip Diagnostic Assay in a Pandemic Context. Frontiers in Medicine.

<https://doi.org/10.3389/fmed.2020.00225>

- Using mathematical simulations, Cherif et al. suggest that a pooled testing strategy (testing a pooled sample from several patients) was more efficient than individual testing when prevalence was below 30%. The optimal pool size was inversely related to the prevalence of SARS-CoV-2 positive specimens and the sensitivity of the assay.

Cherif et al. (June 23, 2020). Simulation of Pool Testing to Identify Patients With Coronavirus Disease 2019 Under Conditions of Limited Test Availability. JAMA Network Open.

<https://doi.org/10.1001/jamanetworkopen.2020.13075>

- In a retrospective analysis of 463 hospitalized COVID-19 patients, Fernandez-Cruz et al. found that in-hospital mortality was lower among patients treated with steroids (14%; 55/396) than in those who were not (24%; 16/67). Glucocorticoids steroid treatment was associated with a 42% reduction in mortality.

Fernández Cruz et al. (June 22, 2020). Impact of Glucocorticoid Treatment In SARS-CoV-2 Infection Mortality: A Retrospective Controlled Cohort Study. Antimicrobial Agents and Chemotherapy. <https://doi.org/10.1128/AAC.01168-20>

- *[pre-print, not peer reviewed]* Madariaga et al. investigated predictors of convalescent antibody production in 103 convalescent plasma donors with confirmed COVID-19 disease and found that age, fever, absence of myalgia, fatigue, AB blood type, and hospitalization were all associated with higher convalescent antibody titer to COVID-19.
- Most (8/10) convalescent plasma recipients had significant increases in antibody levels post-transfusion. Anti-receptor binding domain antibody titer increased on average 31% per day during the first three days post-transfusion ($p=0.01$) and anti-spike antibody titer increased by 40% ($p=0.02$). Eight recipients were discharged, one remained hospitalized, and one died.

Madariaga et al. (June 23, 2020). Clinical Predictors of Donor Antibody Titer and Correlation with Recipient Antibody Response in a COVID-19 Convalescent Plasma Clinical Trial. Pre-print downloaded June 24 from <https://doi.org/10.1101/2020.06.21.20132944>

Clinical Characteristics and Health Care Setting

- In a meta-analysis of 20 studies, Xu et al. found that gender, advanced age, higher BMI, and comorbidities (diabetes, hypertension, cardiovascular disease, and chronic obstructive pulmonary disease) are associated with higher risk for developing severe COVID-19 disease. In addition, several laboratory measures were also associated with severe disease, notably: high white blood cell count, low lymphocyte count, low albumin, high ALT/AST, LDH, C-reactive protein, and creatine kinase.

Xu et al. (June 23, 2020). Risk Factors for 2019 Novel Coronavirus Disease (COVID-19) Patients Progressing to Critical Illness: A Systematic Review and Meta-Analysis. Aging. <https://doi.org/10.18632/aging.103383>

Modeling and Prediction

- Results from a stochastic model of SARS-CoV-2 transmission developed by Lopez et al. suggest that lockdowns should remain in place for a minimum of 60 days, followed by a gradual reintroduction of the workforce. The authors found that social distancing, face masks, gloves and other individual protection measures have a massive impact in reducing the current peak of active cases, but that waning adherence to these interventions over time could result in a larger second epidemic wave.

López and Rodó. (June 22, 2020). The End of Social Confinement and COVID-19 Re-Emergence Risk. Nature Human Behaviour. <https://doi.org/10.1038/s41562-020-0908-8>

- *[pre-print, not peer reviewed]* Moyorga et al. evaluated the impact of different timings and lengths of lockdown periods under scenarios using different values of R_0 , the basic reproductive number for SARS-CoV-2. They found that the timing for the lockdown has a large effect on ICU usage and fatalities. As R_0 increases, an earlier lockdown is needed to control the outbreak, while in lower R_0 scenarios later lockdowns are still effective. A lockdown of <15 days long had a negligible effect in

reducing the impact of SARS-CoV-2 on the healthcare system. However, lockdowns >45 days had diminishing returns on their effect of reducing ICU usage and fatalities.

Mayorga et al. (June 23, 2020). *COVID-19 Lockdown: If, When, and How*. Pre-print downloaded June 24 from <https://doi.org/10.1101/2020.06.20.20136325>

Other Resources and Commentaries

- [A Neutralizing Human Antibody Binds to the N-Terminal Domain of the Spike Protein of SARS-CoV-2](#) – Science (June 22)
- [Accommodating Individual Travel History Global Mobility and Unsampld Diversity in Phylogeography: a SARS-CoV-2 Case Study](#) – Biorxiv (June 23)
- [After COVID-19: Thinking Differently About Running the Health Care System](#) – JAMA (June 23)
- [Are Animals a Neglected Transmission Route of SARS-CoV-2?](#) – Pathogens (June 18)
- [The Novel Coronavirus COVID-19 Outbreak: Global Implications for Antimicrobial Resistance](#) – Frontiers in Microbiology (May 13)
- [The National Institute of Allergy and Infectious Diseases Decision to Stop the Adaptive COVID-19 Trial: On Solid Ethical and Scientific Grounds](#) – JACC Basic to Translational Science (May 26)
- [Covid-19 Is Threatening the Survival of US Primary Care](#) – BMJ (June 22)
- [Potential Years of Life Lost Due to COVID-19 in the United States, Italy, and Germany: An Old Formula with Newer Ideas](#) – International Journal of Environmental Research and Public Health (June 18)

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