



2019-nCoV Literature Situation Report (Lit Rep)

July 7, 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

- **Loosely folded face masks and bandana-style face coverings provided minimal stopping effect for the smallest aerosolized respiratory droplets in emulated coughs and sneezes, while well-fitted homemade masks with multiple layers of quilting fabric and off-the-shelf cone style masks were effective in reducing droplet dispersal.** [More](#)
- **Fewer than one-third of patients with severe COVID-19 who received tocilizumab had clinical improvement within 14 days in an observational study.** [More](#)
- **Deaths per capita due to COVID-19 may be significantly higher in rural counties with social and health vulnerabilities compared to urban, diverse counties, based on a study of 867 counties with 5 or more deaths due to COVID-19.** [More](#)
- **During April and May 2020, 16,233 workers in 239 meat and poultry processing facilities developed confirmed COVID-19, with a case fatality of 0.5%.** [More](#)

Non-Pharmaceutical Interventions

- Close et al. report the development of an aggressive, integrated early-response plan that relies heavily on contact tracing to limit the spread of COVID-19 in a rural eastern Arizonan community of about 18,000 Native Americans. Since the inception of the staff-intensive program, more than 1,600 cases of COVID-19 have been diagnosed on the reservation with a case fatality of 1.1%, which is less than half of that reported for the rest of the state of Arizona.

Close et al. (July 2, 2020). Contact Tracing for Native Americans in Rural Arizona. The New England Journal of Medicine. <https://doi.org/10.1056/NEJMc2023540>

- Using qualitative visualizations of emulated coughs and sneezes, Verma et al. conclude that loosely folded face masks and bandana-style coverings provide minimal stopping-capability for the smallest aerosolized respiratory droplets. Well-fitted homemade masks with multiple layers of quilting fabric and off-the-shelf cone style masks proved to be the most effective in reducing droplet dispersal. They also find that uncovered emulated coughs were able to travel up to 12 feet, notably farther than the currently recommended 6-ft distancing guideline.

Verma et al. (June 30, 2020). Visualizing the effectiveness of face masks in obstructing respiratory jets. Physics of Fluids. <https://doi.org/10.1063/5.0016018>



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Geographic Spread

- [Preprint, not peer-reviewed] By linking county-level sociodemographic, health, and environmental metrics to county-level COVID-19 mortality, Khan et al. find that COVID-19 deaths per capita were significantly higher in rural, vulnerable counties (55.8 deaths per 100,000 people) than in urban, diverse counties (32.2 per 100,000) at 76 days since the first case. Their analysis included 867 counties with 5 or more deaths due to COVID-19.

Khan et al. (July 6, 2020). A County-Level Susceptibility Index and Coronavirus Disease 2019 Mortality in the United States A Socioecological Study. Pre-print downloaded from <https://doi.org/10.1101/2020.07.04.20146084>

- Pollán et al. conducted a population-based survey in Spain and estimate the national prevalence of COVID-19 was 5.0% based on point-of-care testing and 4.6% by immunoassay. Seroprevalence varied significantly by region, with a higher prevalence around Madrid (>10%) and a lower prevalence in coastal areas (<3%).
- Results were based on 61,075 participants who answered a questionnaire on history of symptoms compatible with COVID-19 and risk factors, received a point-of-care antibody test, and donated a blood sample for additional testing with a chemiluminescent microparticle immunoassay.

Pollán et al. (July 6, 2020). Prevalence of SARS-CoV-2 in Spain (ENE-COVID): a nationwide, population-based seroepidemiological study. The Lancet. [https://doi.org/10.1016/S0140-6736\(20\)31483-5](https://doi.org/10.1016/S0140-6736(20)31483-5)

Testing and Treatment

- Caturegli et al. evaluate test characteristics of a serum antibody test for SARS-CoV-2 in a case-control study among hospitalized patients with confirmed COVID-19 (n=60) and controls from healthy lab employees and patients hospitalized for reasons other than COVID-19 (n=513). Sensitivity for detection of SARS-CoV-2 IgG was 97.6% and specificity was 98.8% when performed at least 14 days after symptom onset.

Caturegli et al. (July 6, 2020). Clinical Validity of Serum Antibodies to SARS-CoV-2. Annals of Internal Medicine. <https://pubmed.ncbi.nlm.nih.gov/32628534/>

- Knorr et al. find limited clinical improvement in 66 patients with severe COVID-19 who received tocilizumab. Within 14 days of treatment, 29% of patients had clinical improvement, 20% had minimal or no improvement, 17% worsened, 27% died, and 7% were transferred to an outside hospital. Ultimately, 42% of all patients who received tocilizumab died and 49% were discharged.

Knorr et al. (June 17, 2020). Tocilizumab in patients with severe COVID-19: A single-center observational analysis. Journal of Medical Virology. <https://doi.org/10.1002/jmv.26191>

Clinical Characteristics and Health Care Setting

- Stubblefield et al. conducted a cross-sectional seroprevalence study for SARS-CoV-2 antibodies among healthcare workers in Nashville, TN 4 weeks after the first identified case in the study hospital. Among 249 healthcare personnel who worked in units with COVID-19 patients, 19 (8%) tested positive for SARS-CoV-2 antibodies. Only 11 (58%) of the 19 personnel with positive serology reported symptoms of a prior illness, suggesting asymptomatic healthcare personnel could be an important source of SARS-CoV-2 transmission.

Stubblefield et al. Seroprevalence of SARS-CoV-2 Among Frontline Healthcare Personnel During the First Month of Caring for COVID-19 Patients — Nashville, Tennessee. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa936>

- Argyropoulos et al. found that higher SARS-CoV-2 viral load was associated with shorter duration of symptoms prior to testing among patients seen in emergency departments in New York City (n=205) and was associated with shorter duration of stay for hospitalized patients (n=40). Viral load was not associated with admission to ICU, length of oxygen support, or overall survival.
- The authors suggest that higher viral loads are seen in mild rather than severe disease states because viral load reflects the time since onset of infection.

Argyropoulos et al. (July 2, 2020). Association of initial viral load in SARS-COV-2 patients with outcome and symptoms. The American Journal of Pathology.

<https://doi.org/10.1016/j.ajpath.2020.07.001>

- Borsetto et al. conducted a systematic review and meta-analysis (18 studies with 3,563 patients) that assessed the prevalence of self-reported altered sense of smell or taste in patients with confirmed COVID-19. They found alterations in smell or taste among 31% of participants with severe COVID-19 and 67% of participants with mild-to-moderate COVID-19, with an overall prevalence of 47%. In 20% of participants, the alteration preceded other symptoms, suggesting the value of isolating patients complaining of smell or taste impairment.

Borsetto et al. (May 13, 2020). Self-reported alteration of sense of smell or taste in patients with COVID-19: a systematic review and meta-analysis on 3563 patients. Rhinology Journal.

<https://doi.org/10.4193/Rhin20.185>

Mental Health and Personal Impact

- Taylor et al. describe a COVID-19 stress syndrome using a population-representative sample of 6,854 American and Canadian adults who completed a survey with questions about current mental health and COVID-19-related experiences, distress, and coping. They found that 16% of participants were highly distressed and likely in need of mental health services in a sample population where 2% reported being diagnosed with COVID-19 and 6% were personally acquainted with someone who had COVID-19. Syndrome severity was correlated with preexisting psychopathology and with excessive COVID-19-related avoidance, panic buying, and coping difficulties during self-isolation.

Taylor et al. (July 5, 2020). COVID stress syndrome: Concept, structure, and correlates.

Depression and Anxiety. <https://doi.org/10.1002/da.23071>

Modeling and Prediction

- To determine when mobility restrictions reduce the size of an epidemic, Espinoza et al. use a model of disease transmission within and between economically heterogeneous locally connected communities, one with a low-risk, low-density population and the other with a high-risk, high-density population.
- Unrestricted mobility between the two communities increases the number of secondary cases in the low-risk community but reduces the overall epidemic size.
- The imposition of a cordon sanitaire around the high-risk community reduces the number of secondary infections in the low-risk community but increases the overall epidemic size.

Espinoza et al. (July 6, 2020). Mobility restrictions for the control of epidemics: When do they work? PLOS One. <https://doi.org/10.1371/journal.pone.0235731>

- Chaudhuri et al. construct a macro-level model of the growth rate of the infected population and a micro-level model of the physics of respiratory droplets, combining the two with theoretical

knowledge to create a tool that clarifies the role of environmental factors in COVID-19 spread. They write that, with extreme caution, the combined models could be used to estimate the potential risk of infection spread by droplet transmission for specific ambient conditions of interest.

Chaudhuri et al. (June 30, 2020). Modeling the role of respiratory droplets in Covid-19 type pandemics. Physics of Fluids. <https://doi.org/10.1063/5.0015984#i20>

Public Health Policy and Practice

- According to a CDC update, during April and May of 2020, 16,233 workers in 239 meat and poultry processing facilities developed confirmed COVID-19, with a case fatality of 0.5% (86 deaths). Among cases whose race or ethnicity were reported, 87% are racial or ethnic minorities. The authors recommend continued attention to workplace interventions and prevention efforts that are appropriately tailored to the groups most affected by COVID-19, including face masks, physical barriers between workers, and hand hygiene station.

Waltenburg et al. (July 7, 2020). Update: COVID-19 Among Workers in Meat and Poultry Processing Facilities — United States, April–May 2020. MMWR. <https://doi.org/10.15585/mmwr.mm6927e2>

Other Resources and Commentaries

- [Increased internet search interest for GI symptoms may predict COVID-19 cases in US hotspots](#) – Clinical Gastroenterology and Hepatology (June 15)
- [Coronavirus and Quarantine: Catalysts of Domestic Violence](#) – Violence Against Women (July 6)
- [Repositioning chloroquine as antiviral prophylaxis against COVID-19: potential and challenges](#) – Drug Discovery Today (July 3)
- [Surprise Medical Billing: Compelling Need to Address Uncertainty, Anxiety, and Financial Peril for Patients](#) – Circulation (July 6)
- [Objective sensory testing methods reveal a higher prevalence of olfactory loss in COVID-19 positive patients compared to subjective methods: A systematic review and meta-analysis](#) – medRxiv (July 6)
- [SARS-CoV-2 host diversity: An update of natural infections and experimental evidence](#) – Journal of Microbiology, Immunology and Infection (June 25)
- [Progress and Challenges in the Development of COVID-19 Vaccines and Current Understanding of SARS-CoV-2- Specific Immune Responses](#) – Journal of Microbiology and Biotechnology (June 16)
- [COVID-19: Post-lockdown guidelines](#) – International Journal of Molecular Medicine (June 12)
- [Advances in Detection of Infectious Agents by Aptamer-based Technologies](#) – Emerging Microbes and Infections (July 5)
- [It is Time to Address Airborne Transmission of COVID-19](#) – Clinical Infectious Diseases (July 6)
- [Potential neurological effects of severe COVID-19 infection](#) – Neuroscience Research (July 3)
- [Developing a SARS-CoV-2 Vaccine at Warp Speed](#) – JAMA (July 6)
- [Comparing SARS-CoV-2 with SARS-CoV and influenza pandemics](#) – The Lancet Infectious Disease (July 3)
- [Global pattern of COVID-19 research](#) – medRxiv (July 6)

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