2019-nCoV Literature Situation Report (Lit Rep)
February 24, 2021

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

- **The Johnson and Johnson one-dose SARS-CoV-2 vaccine candidate Ad26.COV2.S was determined by the FDA to have met requirements for emergency use authorization. The vaccine efficacy against moderate to severe COVID- was 66.9% when considering cases occurring at least 14 days after vaccination, and 66.1% considering cases occurring at least 28 days after vaccination. Efficacy against severe/critical COVID-19 occurring at least 14 days and at least 28 days after vaccination was 76.7% and 85.4%, respectively.** More
- **A large outbreak of COVID-19 occurred among attendees of indoor high-intensity fitness classes at a Chicago exercise facility in August, 2020, with 55 cases identified among 81 attendees (68% attack rate). Classes were held at reduced capacity (<25%) and participants were required to space mats at least 6 feet apart. Most attendees wore masks infrequently (79%).** More
- **An outbreak of COVID-19 cases occurred that was linked to a fitness instructor resulting in cases at 3 fitness facilities. The highest attack rate (95%) occurred in classes that were taught <1 day before the onset of symptoms in the instructor.** More
- **In a sample of 118 participants recruited from clinical trials at a single center in the United States, 82% of hospitalized patients and 64% of non-hospitalized patients had persistent symptoms 3-4 months after COVID-19 diagnosis. The most prevalent symptoms included fatigue and difficulty breathing (dyspnea).** More

Transmission

- A large outbreak of COVID-19 occurred among attendees of indoor high-intensity classes at a Chicago exercise facility in August, 2020, with 55 cases identified among 81 attendees (68% attack rate). All classes were held at reduced capacity (<25%), temperature checks were required upon entry, and participants were required to space mats at least 6 feet apart. 22 (40%) people with COVID-19 attended classes on or after the day symptoms began, and most attendees (76%) wore masks infrequently, including people with (84%) and without COVID-19 (60%). Overall, 43 (78%) of attendees with COVID-19 attended more than one class while they were potentially infectious.

  Lendacki et al. (Feb 24, 2021). COVID-19 Outbreak Among Attendees of an Exercise Facility — Chicago, Illinois, August–September 2020. MMWR. https://doi.org/10.15585/mmwr.mm7009e2

- An outbreak of COVID-19 cases occurred that was linked to a fitness instructor resulting in cases at 3 fitness facilities, with the highest attack rate (95%) occurring in classes that were taught <1 day before the onset of symptoms in the instructor. Twenty-one cases of COVID-19 were linked to an index case fitness instructor in Hawaii in July, 2020, including a case in another fitness instructor. The aggregate attack rates in classes taught by both instructors <1 day, 1 to <2 days, and ≥2 days

before symptom onset were 95% (20 of 21), 13% (one of eight), and 0% (zero of 33), respectively. Among the 21 secondary cases, 20 (95%) had symptomatic illness, two (10%) of whom were hospitalized. At the time of the outbreak, mask use was not required in the facilities.

Groves et al. (Feb 24, 2021). Community Transmission of SARS-CoV-2 at Three Fitness Facilities — Hawaii, June–July 2020. MMWR. https://doi.org/10.15585/mmwr.mm7009e1

Geographic Spread

- The incidence and mortality trends of COVID-19 in rural counties increased and surpassed those in metropolitan areas beginning in early August 2020. Residents of nonmetropolitan counties accounted for 14% of the 8,085,214 confirmed COVID-19 cases and 11% of the 217,510 deaths in the United States from March 1-October 18, 2020. The average daily COVID-19 incidence rate over the entire study period was 9.8 cases per 100,000 persons and the average daily mortality rate was 0.19 deaths per 100,000 persons. The authors note that the disease burden had shifted from metropolitan to nonmetropolitan areas, and that future work should evaluate the impact of rural-focused public health campaigns.

  Matthews et al. (Feb 22, 2021). Nonmetropolitan COVID-19 Incidence and Mortality Rates Surpassed Metropolitan Rates within the First 24 Weeks of the Pandemic Declaration: United States, March 1–October 18, 2020. The Journal of Rural Health. https://doi.org/10.1111/jrh.12555

Testing and Treatment

- A randomized clinical trial comparing the effectiveness of a modified "super-compound interferon" (rSIFN-co) to standard of care in China (which includes treatment with traditional interferon-alpha) indicated that rSIFN-co was associated with a shorter time to clinical improvement. Patients were blinded to treatment arm and received the standard of care, which also included lopinavir-ritonavir or umifenovir but the treating clinicians were aware of study assignment. Only 10% of participants received corticosteroids. Clinical improvement was defined as two-points improvement on the WHO scale. In this cohort, the time to clinical improvement in the rSIFN-co group compared to interferon-alpha was 11.5 days versus 14.0 days, the overall rate of clinical improvement on day 28 was 93.5% versus 77.1%, and the time to virus nucleic acid negative conversion was 7.0 days versus 10.0 days. Adverse events were balanced with no deaths among either group.

  Li et al. (Jan 1, 2021). Effect of a Genetically Engineered Interferon-Alpha versus Traditional Interferon-Alpha in the Treatment of Moderate-to-Severe COVID-19: A Randomised Clinical Trial. Annals of Medicine. https://doi.org/10.1080/07853890.2021.1890329

- *[Pre-print, not peer-reviewed]* Self-testing for SARS-CoV-2 using rapid antigen detection kits (RDT) was found to have a high specificity (99.4%) and relatively high sensitivity (78%) to identify individuals infected with SARS-CoV-2 RNA below a low cycle-time (CT) value threshold. Low CT values are associated with high viral load and the authors suggest that is a as a proxy for contagiousness. Factors independently associated with false-negative results were older age, low viral load, and difficulty with self-testing.

  Stohr et al. (Feb 23, 2021). Self-Testing for the Detection of SARS-CoV-2 Infection with Rapid Antigen Tests. Pre-print downloaded Feb 24 from https://doi.org/10.1101/2021.02.21.21252153

- *[Pre-print, not peer-reviewed]* An online survey of 106 workers at homeless shelters in 17 shelter networks in Washington, Massachusetts, Utah, Maryland and Georgia found that 15% of workers reported testing positive for SARS-CoV-2, with 80% believing they were infected at work. The survey was conducted to assess occupational exposures to SARS-CoV-2, characterize job practices, and assess COVID-19 mitigation measures in the workplace. All shelter networks had implemented at least one prevention measure. Nearly 40% of workers reported having close contact with a person

with known SARS-CoV-2 infection and believed the contact occurred at work. Reported frequent close contact with clients was significantly associated with testing positive for SARS-CoV-2 (prevalence ratio=3.97).

Rao et al. (Feb 23, 2021). Occupational Exposures and Mitigation Strategies among Homeless Shelter Workers at Risk of COVID-19. Pre-print downloaded Feb 24 from https://doi.org/10.1101/2021.02.22.21251646

Vaccines and Immunity

- The Johnson & Johnson single-dose Ad26.COV2.S vaccine candidate was determined by the FDA to have met the safety and efficacy requirements for emergency use authorization. Vaccine efficacy against laboratory-confirmed moderate to severe/critical COVID-19 across all geographic areas in which the trial was conducted was 66.9% when considering cases occurring at least 14 days after the single-dose vaccination and 66.1% considering cases occurring at least 28 days after vaccination. Efficacy against severe/critical COVID-19 occurring at least 14 days and at least 28 days after vaccination was 76.7% and 85.4%, respectively. As of February 5, 2021, there were 7 COVID-19 related deaths in the placebo group and no COVID-19 related deaths in the vaccine group. A subset of participants (n=6,736) was followed for self-reported reactions to the vaccine within 7 days following vaccination, and the most common adverse reactions were mild to moderate injection site pain (48.6%), headache (38.9%), fatigue (38.2%), and myalgia (33.2%).

  FDA. (Feb 26, 2021). Janssen Ad26.COV2.S Vaccine for the Prevention of COVID-19. Vaccines and Related Biological Products Advisory Committee Meeting. https://www.fda.gov/media/146217/download

- *[Pre-print, not peer-reviewed*] An assessment of immune responses following a single dose of the Pfizer-BioNTech vaccine (BNT162b2) vaccine using pseudoviruses expressing the wild-type Spike protein or the B.1.1.7 spike protein showed that the vaccine-elicited antibodies modestly reduced activity against the B.1.1.7 variant. This reduction was also observed in sera from some convalescent patients and with monoclonal antibodies (mAbs) targeting the N-terminal domain (9 out of 10) and the Receptor Binding Motif (RBM) (5 out of 31), but not in neutralizing mAbs binding outside the RBM. Introduction of the E484K mutation in B.1.1.7 led to a greater loss of neutralizing activity by sera from vaccinees and mAbs (19 out of 31).

  Collier et al. (Feb 2021). SARS-CoV-2 B.1.1.7 Sensitivity to MRNA Vaccine-Elicited, Convalescent and Monoclonal Antibodies. Pre-print downloaded Feb 24 from https://doi.org/10.1101/2021.01.19.21249840

- *[Pre-print, not peer-reviewed]* A cross-sectional survey of healthcare professionals (HCP) (n=2,448) from three Northern California medical centers conducted from November 16-December 8, 2020 indicated that overall enthusiasm for the COVID-19 vaccine was strong, and more HCP (69%) said they would definitely/likely receive vaccine if it were formally FDA-approved versus if it were approved via emergency use authorization only (35%). Most respondents (36%) were interested in being vaccinated after the first round, rather than being among the earliest to receive the vaccine (25%). Factors that increased motivation for vaccination included perceiving risk from COVID-19 to self (65%) or to family/friends (63%). The most frequent concerns were vaccine side effects (28%) and political interference in the FDA approval process (12%).

  Jain et al. (Feb 23, 2021). Healthcare Personnel Knowledge Motivations Concerns and Intentions Regarding COVID-19 Vaccines a Cross-Sectional Survey. Pre-print downloaded Feb 24 from https://doi.org/10.1101/2021.02.19.21251993

Clinical Characteristics and Health Care Setting

- Persistent COVID-19 symptoms at 3-4 month after infection were found in 82% of patients who had been hospitalized and 64% of those who had not been hospitalized, the most prevalent of which included fatigue and difficulty breathing (dyspnea). Patients were recruited from clinical trials occurring at a single center (Stanford). The majority had mild/moderate COVID-19 with only 22/118 (19%) hospitalized during initial illness. While cough, dyspnea, and sore throat at COVID-19 onset were associated with having ≥2 symptoms at 3-4 months post-COVID-19 in univariate analysis, after adjusting for gender, age, race/ethnicity, hospitalization status, and BMI, only dyspnea at disease onset was significantly associated with ≥2 persistent symptoms (aOR=3.7). The study also noted significant memory problems (17%) and hair loss (12%) at follow-up.

  Jacobson et al. (Feb 7, 2021). Patients with Uncomplicated COVID-19 Have Long-Term Persistent Symptoms and Functional Impairment Similar to Patients with Severe COVID-19: A Cautionary Tale during a Global Pandemic. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciab103

- The prevalence of invasive pulmonary aspergillosis (IPA) was not higher for mechanically ventilated COVID-19 patients compared to what has been described in other populations with acute respiratory distress syndrome (ARDS), according to a retrospective cohort study. The prevalence of IPA among non-immunocompromised patients in this cohort (n=52 patients) was 3.7%. Most (71%) of the patients were male, and their median age was 65.

  Versyck et al. (June 2021). Invasive Pulmonary Aspergillosis in COVID-19 Critically Ill Patients: Results of a French Monocentric Cohort. Journal of Medical Mycology. https://doi.org/10.1016/j.mycmed.2021.101122

Public Health Policy and Practice

- Approximately a quarter of SARS-CoV-2 infected patients at a low-barrier testing site serving a low-income Latinx community in San Francisco were already outside the 10-day window of isolation at the time they received counseling on isolation. Among symptomatic participants (n=145), 83% percent had moderate to high levels of virus (Ct <33). All participants received post-test guidance on the day of testing on how to quarantine while awaiting test results if they were experiencing symptoms or had a recent exposure to someone with COVID-19. Participants with a positive test result received counseling about isolation on a median of day 7 (out of a ten day recommended quarantine period). Access to a test site was the most common barrier to testing, and food and income loss was the most commonly reported barrier to isolation.

  Rubio et al. (Feb 1, 2021). The COVID-19 Symptom to Isolation Cascade in a Latinx Community: A Call to Action. Open Forum Infectious Diseases. https://doi.org/10.1093/ofid/ofab023

- COVID-19 exacerbated existing capacity issues at different community health centers (CHCs) in the US, according to results from a cross-sectional survey and focus groups with healthcare personnel. Survey respondents (n=234; 19% response rate) indicated that the top resource and educational needs were related to COVID-19 infection prevention and control (76%), safety precautions (72%), and screening, diagnostic testing, and management of patients (66%). Focus group results (n=39) showed that needs included unity among leadership, more resources (including PPE and testing supplies), as well as increased workforce capacity, clearer communications, and formal policies and procedures, particularly related to triage.

  Damian et al. (Feb 23, 2021). A National Study of Community Health Centers' Readiness to Address COVID-19. The Journal of the American Board of Family Medicine. https://doi.org/10.3122/jabfm.2021.S1.200167

Other Resources and Commentaries

- The Centers for Medicare and Medicaid Services (CMS) COVID-19 Brief: Unsettling Racial and Ethnic Health Disparities – Journal of the American Board of Family Medicine : JABFM (Feb)
- Racial Disparities in COVID-19 Impacts in Michigan, USA – Journal of Racial and Ethnic Health Disparities (Feb)
- Downsides of Face Masks and Possible Mitigation Strategies: A Systematic Review and Meta-Analysis – BMJ Open (Feb 22)
- Rural and Urban Differences in COVID-19 Prevention Behaviors – The Journal of Rural Health : Official Journal of the American Rural Health Association and the National Rural Health Care Association (Feb)
- Neutralizing Antibody Responses 10 Months after Mild and Moderately-Severe SARS-CoV-2 Infection – MedRxiv (Feb 23)
- COVID-19 Vaccine Hesitancy in Underserved Communities of North Carolina – MedRxiv (Feb 23)
- Estimating the Spreading and Dominance of SARS-CoV-2 VOC 20201201 (Lineage B.1.1.7) across Europe – MedRxiv (Feb 23)
- An Allele-Specific Primer Extension Assay to Quantify the Proportion of B.1.1.7-Specific SARS-CoV-2 RNA in Wastewater – MedRxiv (Feb 23)
- Rapid SARS-CoV-2 Variants Spread Detected in France Using Specific RT-PCR Testing – MedRxiv (Feb 23)
- Covid-19: Vaccine Success Drives England's Lockdown Exit – BMJ (Clinical Research Ed.) (Feb)
- Effect of Layperson-Delivered, Empathy-Focused Program of Telephone Calls on Loneliness, Depression, and Anxiety Among Adults During the COVID-19 Pandemic: A Randomized Clinical Trial – JAMA Psychiatry (Feb)
- Influence of a COVID-19 Vaccine's Effectiveness and Safety Profile on Vaccination Acceptance – Proceedings of the National Academy of Sciences (Jan 21)
- Why COVID Vaccines Are so Difficult to Compare – Nature (Feb)
- Contact-Tracing Apps Help Reduce COVID Infections, Data Suggest – Nature (Feb)
- An Interactive Tool to Forecast US Hospital Needs in the Coronavirus 2019 Pandemic – JAMIA Open (Dec 2020)
- COVID-19 Communication—The Need for Humanity, Empathy, and Grace – JAMA (Feb 23)
- Pregnancy and Neonatal Outcomes of COVID -19: Co-reporting of Common Outcomes from PAN-COVID and AAP SONPM Registries – Ultrasound in Obstetrics & Gynecology (Feb 23)
- Collecting Data About COVID-19–Related Brain Symptoms – JAMA (Feb 23)
- Locating COVID-19 Monoclonal Antibody Therapies – JAMA (Feb 23)
- SARS-CoV-2 Exposure in Escaped Mink, Utah, USA – Emerging Infectious Diseases (Mar)
- Behind the Scenes of the Pfizer BioNTech Covid-19 Vaccine Trial – BMJ (Feb 23)
- A Mobile Unit Overcomes the Challenges to Monoclonal Antibody Infusion for COVID-19 in Skilled Care Facilities – Journal of the American Geriatrics Society (Feb)

Report prepared by the UW Alliance 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