2019-nCoV Literature Situation Report (Lit Rep)

January 29, 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

- **Health care workers hospitalized for COVID-19 were less likely to require admission to an intensive care unit and less likely to be admitted for 7 days or longer when compared to matched non-healthcare workers. There were no differences between HCWs and non-HCWs in terms of need for mechanical ventilation.** More
- **The BinaxNow Antigen Card showed low analytical sensitivity (53%) for detecting SARS-CoV-2 infection in a population of asymptomatic or pre-symptomatic individuals when compared to RT-PCR testing for SARS-CoV-2.** More
- **Cervical cancer screening rates among 1.5 million women served by Kaiser Permanente Southern California declined during stay-at-home orders from March to June 2020 by 78-82% compared to screening rates in 2019. The decline in screening rates were consistent across racial and ethnic groups.** More
- **The Johnson and Johnson single-dose COVID-19 candidate vaccine had 66% efficacy against moderate to severe COVID-19, based on a press release describing the phase 3 clinical trial results from the ENSEMBLE trial. This is the first clinical trial of a single dose vaccine to report efficacy data.** More

Non-Pharmaceutical Interventions

- After an outbreak of 371 cases of COVID-19 on an Indiana university campus, the university was able to rapidly decrease new cases and gradually return to in-person learning by implementing aggressive transmission mitigation policies. These included aggressive testing, tracing, and isolation program, switching to online instruction for 2 weeks, mandating masks and physical distancing, developing a communication campaign focused on mitigation measures, and increasing rapid antigen test site hours and capacity. Most cases occurred among undergraduates, with several large off-campus gatherings identified as the source of the exposure.

  Fox et al. (Jan 29, 2021). Response to a COVID-19 Outbreak on a University Campus — Indiana, August 2020. MMWR. https://doi.org/10.15585/mmwr.mm7004a3

Transmission

- COVID-19 cases linked to outbreaks on college campuses in Wisconsin increased rapidly in August 2020, and were followed by outbreaks at long-term care facilities, correctional facilities, and

colleges/universities. From May 13–September 2, long-term care facilities (2,850 cases; 21%) and manufacturing or food processing facilities (2,672 cases; 20%) accounted for the largest number of outbreak-associated cases, and restaurants and bars (1,633 cases; 12%) and other workplaces (1,320 cases; 10%) accounted for an increasing proportion of outbreak-associated cases until mid-August. From September 3–November 16, 2020, daily confirmed cases rose at a rate of 24% per week, from a 7-day average of 674 to 6,426.

Pray et al. (Jan 29, 2021). Trends in Outbreak-Associated Cases of COVID-19 — Wisconsin, March–November 2020. MMWR. http://dx.doi.org/10.15585/mmwr.mm7004a2

Testing and Treatment

- The BinaxNow Antigen Card showed low analytical sensitivity (53%) for detecting SARS-CoV-2 infection in a population of asymptomatic or pre-symptomatic individuals when compared to RT-PCR testing for SARS-CoV-2.

  Okoye et al. (Jan 27, 2021). Performance Characteristics of BinaxNOW COVID-19 Antigen Card for Screening Asymptomatic Individuals in a University Setting. Journal of Clinical Microbiology. https://doi.org/10.1128/JCM.03282-20

- *[Pre-print, not peer-reviewed]* Abdel-Sater et al. reported the development of a rapid molecular test to identify the SARS-CoV-2 B.1.1.7 (UK) variant using a set of RT-PCR primers that were designed to confirm the deletion mutations Δ69/Δ70 in the spike and the Δ106/Δ107/Δ108 in the NSP6 gene. The large-scale screening method may help bypass the need for widespread sequencing to confirm the presence of both the B.1.1.7 variant and variants with similar deletions.

  Abdel-Sater et al. (Jan 29, 2021). A Rapid and Low-Cost protocol for the detection of B.1.1.7 lineage of SARS-CoV-2 by using SYBR Green-Based RT-qPCR. Pre-print downloaded Jan 29 from https://doi.org/10.1101/2021.01.27.21250048

- One in five symptomatic patients admitted to the medical department who had a negative SARS-CoV-2 swab received a clinical diagnosis of COVID-19 according to a retrospective cohort study from two large London hospitals. Swab-negative clinical COVID-19 cases were defined as (a) clinical COVID-19 or high level of suspicion as defined by the treating medical team (as recorded in the medical record); and (b) RT-PCR swab-negative on both initial and any subsequent testing. Swab-negative clinical COVID-19 patients had better outcomes, with shorter length of hospital stay, reduced need for supplementary oxygen and reduced mortality.

  Middleton et al. (Jan 27, 2021). Characteristics and outcomes of clinically diagnosed RT-PCR swab negative COVID-19: a retrospective cohort study. Scientific Reports. https://doi.org/10.1038/s41598-021-81930-0

Vaccines and Immunity

- *[Press release, not peer-reviewed]* The Johnson and Johnson single-dose COVID-19 candidate vaccine had 66% efficacy against moderate to severe COVID-19, based on a press release describing the phase 3 clinical trial results from the ENSEMBLE trial. Among all participants including those infected with an emerging viral variant the vaccine prevented moderate to severe COVID-19 28 days after vaccination with the first evidence of protection observed as early as day 14. The level of protection

against moderate to severe COVID-19 infection was 72% in the United States, 66% in Latin America, and 57% in South Africa 28 days post-vaccination.

Johnson & Johnson (Jan 29, 2021). Johnson & Johnson Announces Single-Shot Janssen COVID-19 Vaccine Candidate Met Primary Endpoints in Interim Analysis of its Phase 3 ENSEMBLE Trial. Press release downloaded Jan 29 from https://www.jnj.com/johnson-johnson-announces-single-shot-janssen-covid-19-vaccine-candidate-met-primary-endpoints-in-interim-analysis-of-its-phase-3-ensemble-trial

- *[Pre-print, not peer-reviewed]* Using a lentivirus-based pseudovirus assay, the SARS-CoV-2 B.1.1.7 (UK) variant was shown to exhibit only modestly reduced susceptibility to neutralization from convalescent sera (1.5-fold average reduction) and sera from recipients of both the Moderna and Novavax vaccine phase 1 studies (2-fold average reduction after two inoculations. The authors used the prototypic D614G variant as a comparator.

  Cheng et al. (Jan 28, 2021). SARS-CoV-2 variant B.1.1.7 is susceptible to neutralizing antibodies elicited by ancestral Spike vaccines. Pre-print downloaded Jan 29 from https://doi.org/10.1101/2021.01.27.428516

- *[Pre-print, not peer-reviewed]* The first dose of the BNT162b2 mRNA COVID-19 vaccine (Pfizer–BioNTech) is associated with an approximately 51% reduction in the incidence of PCR-confirmed SARS-CoV-2 infections at 13 to 24 days after immunization compared to the rate during the first 12 days. These findings are based on a retrospective cohort study in Israel (December 19 to January 15). Similar levels of effectiveness were found across age groups, sex, as well as among individuals residing in Arab or ultra-orthodox Jewish communities that have experienced an increased COVID-19 risk.

  Chodcik et al. (Jan 29, 2021). The effectiveness of the first dose of BNT162 b 2 vaccine in reducing SARS-CoV-2 infection 13-24 days after immunization real-world evidence. Pre-print downloaded Jan 29 from https://doi.org/10.1101/2021.01.27.21250612

- *[Pre-print, not peer-reviewed]* Follow-up of 11,468 adults with mild or asymptomatic COVID-19 infection found that serological evidence of previous infection, specifically the presence of either IgG or IgM antibodies, waned quickly over time, with roughly 50% of people undergoing sero-reversion within 30 days of their initial positive test. The rate of sero-reversion was not associated with age, sex, race/ethnicity, or healthcare worker status.

  Herrington et al. (Jan 29, 2021). Duration of SARS-CoV-2 Sero-Positivity in a Large Longitudinal Sero-Surveillance Cohort The COVID-19 Community Research Partnership. Pre-print downloaded Jan 29 from https://doi.org/10.1101/2021.01.27.21250615

Clinical Characteristics and Health Care Setting

- Health care workers (HCWs) hospitalized with COVID-19 were less likely to require admission to an intensive care unit (aOR, 0.6; 95% CI, 0.3-0.9) and less likely to be admitted for 7 days or longer (aOR, 0.5; 95% CI, 0.3-0.8) when compared to matched non-healthcare workers in a retrospective, observational cohort involving 36 North American centers. There were no differences between matched HCWs and non-HCWs in terms of need for mechanical ventilation (aOR, 0.7; 95% CI, 0.4-1.2), death (aOR, 0.5; 95% CI, 0.2-1.3), or use of vasopressors (aOR, 0.7; 95% CI, 0.4-1.2).

Yang et al. (Jan 28, 2021). Outcomes of COVID-19 Among Hospitalized Health Care Workers in North America. JAMA Network Open. https://doi.org/10.1001/jamanetworkopen.2020.35699

- *[Pre-print, not peer-reviewed]* No association was found between the proportion of the UK SARS-CoV-2 variant B.1.1.7 in circulation and reported disease severity, according to data obtained from reporting of symptoms and test results via the COVID Symptom Study application. The authors controlled for both demographic characteristics (age, sex) and seasonal variables (temperature, humidity). No effects were observed based on the number of different reported symptoms, hospitalizations, frequency any of the individual symptoms, or the proportion of individuals with long symptom duration (≥28 days). The proportion of individuals with duration of symptoms ≥28 days did not change in association with the presence of the B.1.1.7 variant. The proportion of users with asymptomatic disease did not significantly change as B.1.1.7 increased in prevalence.
  Graham et al. (Jan 29, 2021). The effect of SARS-CoV-2 variant B.1.1.7 on symptomatology re-infection and transmissibility. Pre-print downloaded Jan 29 from https://doi.org/10.1101/2021.01.28.21250680

- *[Pre-print, not peer-reviewed]* Eighty percent (95%CI: 65% to 92%) of persons infected with SARS-CoV-2 developed one or more long-term symptoms, according to a systematic review and meta-analysis (n=47,910 patients) assessing long-term effects of COVID-19. Follow-up time of study participants ranged from 15 to 110 days post-viral infection. The age of the study participants ranged between 17 and 87 years. The five most common symptoms were fatigue (58%), headache (44%), attention disorder (27%), hair loss (25%), and difficulty breathing (dyspnea) (24%).
  Lopez-Leon et al. (Jan 29, 2021). More than 50 Long-term effects of COVID-19: a systematic review and meta-analysis. Pre-print downloaded Jan 29 from https://doi.org/10.1101/2021.01.27.21250617

Modeling and Prediction

- *[Pre-print, not peer-reviewed]* Extending the interval between doses of the Moderna vaccine from 4 weeks to 9-12 weeks could prevent additional infections, hospitalizations, and deaths according to an agent-based model. However, there was no clear advantage for delaying the second dose of the Pfizer-BioNTech vaccines beyond the standard 3-week interval. This is largely attributable to the differences in efficacy used for the first dose of each vaccine (52% for the Pfizer-BioNTech versus 80% for the Moderna vaccine). The authors note uncertainty about how quickly immunity wanes following vaccination, and developed scenarios with different assumptions for this parameter.
  Moghadas et al. (Jan 29, 2021). Evaluation of COVID-19 vaccination strategies with a delayed second dose. Pre-print downloaded Jan 29 from https://doi.org/10.1101/2021.01.27.21250619

- Using previously collected indoor air quality data from New York City public schools, Pavilonis et al. estimated the probability of in-classroom transmission to be 5% for student-to-student transmission, 14% for student-to-teacher transmission, and 20% for teacher-to-student transmission after the introduction of one infectious person into the classroom. Consistent mask wearing by both students and teachers was associated with lower predicted transmission rates, while the probability of transmission increased during the winter due to closing windows and doors to retain heat. Classrooms with mechanical ventilation, which increases the rate of outdoor airflow in indoor classrooms, had lower predicted probabilities of infection. Older schools and schools in low-income

areas had lower predicted probability of transmission, potentially due to lower airtightness compared to newer or recently renovated schools.

Pavilonis et al. (Jan 26, 2021). Estimating Aerosol Transmission Risk of SARS-CoV-2 in New York City Public Schools During Reopening. Environmental Research. https://doi.org/10.1016/j.envres.2021.110805

Public Health Policy and Practice

- Cervical cancer screening rates decreased among 1.5 million women served by Kaiser Permanente Southern California during stay-at-home orders implemented in March 2020 in response to the COVID-19 pandemic. Compared with 2019 screening rates, 2020 screening rates among women aged 21-29 years and aged 30-65 years were 78% and 82% lower, respectively, during the stay-at-home order (March-June). After the stay-at-home orders were lifted, screening rates returned to near baseline but were still 24-29% lower compared to 2019 rates. The decline in screening rates were consistent across racial and ethnic groups.

  Miller et al. (Jan 29, 2021). Impact of COVID-19 on Cervical Cancer Screening Rates Among Women Aged 21-65 Years in a Large Integrated Health Care System - Southern California, January 1-September 30, 2019, and January 1-September 30, 2020. MMWR. https://doi.org/10.15585/mmwr.mm7004a1

Other Resources and Commentaries

- Novavax offers first evidence that COVID vaccines protect people against variants Nature (Jan 29, 2021)
- Face Mask Use in the Community for Reducing the Spread of COVID-19: A Systematic Review Frontiers in Medicine (Jan 12, 2021)
- Different Responses to COVID-19 in Four US States: Washington, New York, Missouri, and Alabama AJPH (Jan 28, 2021)
- Sequencing Data of North American SARS-CoV-2 Isolates Shows Widespread Complex Variants MedRxiv (Jan 29, 2021)
- We Must Fix US Health and Public Health Policy AJPH (Jan 28, 2021)
- Insuring the Population During National Emergencies Leveraging Both Medicaid and the Marketplace AJPH (Jan 29, 2021)
- The new COVID-19 poor and the neglected tropical diseases resurgence Infectious Diseases of Poverty (Jan 29, 2021)
- Access to personal protective equipment in exposed healthcare workers and COVID-19 illness, severity, symptoms and duration: a population-based case-control study in six countries BMJ Global Health (Jan 28, 2021)
- Insights from SARS-CoV-2 sequences Science (Jan 29, 2021)
- SARS-CoV-2 Vaccines and the Growing Threat of Viral Variants JAMA (Jan 29, 2021)
- Particulate matter (PM2.5) as a potential SARS-CoV-2 carrier Scientific Reports (Jan 29, 2021)
- Governmental actions to address COVID-19 misinformation Journal of Public Health Policy (Jan 28, 2021)
- Risk perception of COVID-19 and its socioeconomic correlates in the United States A social media analysis MedRxiv (Jan 29, 2021)

- Safety and immunogenicity of INO-4800 DNA vaccine against SARS-CoV-2: A preliminary report of an open-label, Phase 1 clinical trial EClinicalMedicine (Jan 01, 2021)

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