

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

April 2, 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

- **In a Wisconsin state prison, 79% of the incarcerated population and 3% of staff members contracted SARS-CoV-2 within 8 weeks after the prison received six newly transferred persons who were not initially identified to be SARS-CoV-2 positive at time of intake. Genome sequencing of 172 cases showed that all specimens belonged to the same lineage. [More](#)**
- **Compared to the wild-type SARS-CoV-2 strain, neutralizing activity against the SARS-CoV-2 variant CAL.20C (aka B.1.427/B.1.429) first described in California was 3- to 4-fold lower in individuals fully vaccinated with the Moderna and Pfizer-BioNTech vaccines. Neutralization was 5-fold lower among those with prior infection. [More](#)**

### Transmission

- In a Wisconsin state medium-security prison, 79% of the incarcerated population and 3% of staff members contracted SARS-CoV-2 in a span of 8 weeks after the prison received six newly transferred persons who were not identified to be SARS-CoV-2 positive at the time of intake. On August 13 the transferred persons were quarantined with other incarcerated persons who were also recently transferred in the intake unit, and were identified as positive for SARS-CoV-2 on August 25. The positive persons were immediately isolated and the rest of the intake unit underwent a 14-day quarantine. Facility-wide testing was conducted on September 1 and newly positive persons were transferred to the intake unit. Subsequent facility-wide testing indicated rapid spread. A 2.4% positivity rate was detected on September 1, which increased to 46% by September 23, at which point the facility no longer had space to medically isolate or quarantine incarcerated persons. A modified lockdown was put in place, but staff members continued rotations due to staff shortages. By October 22, 79% of the incarcerated population and 3% of staff members contracted SARS-CoV-2. Genome sequencing of 172 cases showed that all specimens belonged to the same lineage. The outbreak resulted in 6 hospitalizations and 1 death among incarcerated persons.

*Hershow et al. (Apr 2, 2021). Rapid Spread of SARS-CoV-2 in a State Prison After Introduction by Newly Transferred Incarcerated Persons — Wisconsin, August 14–October 22, 2020. MMWR.*

<https://doi.org/10.15585/mmwr.mm7013a4>

- Workers designated as having essential jobs had an estimated 55% higher likelihood of SARS-CoV-2 infection compared to those with non-essential jobs in Pennsylvania from February to June 2020, according to a difference-in-differences model based on medical claims data. Household transmission was also estimated to be higher among essential workers. Dependents and roommates

cohabiting with an essential worker were 17% and 38% more likely to have SARS-CoV-2 infection, respectively, compared to those of non-essential workers.

*Song et al. (Apr 1, 2021). The Impact of the Non-Essential Business Closure Policy on Covid-19 Infection Rates. International Journal of Health Economics and Management.*

<https://doi.org/10.1007/s10754-021-09302-9>

- Risk of SARS-CoV-2 transmission via aerosols beyond 1.5 meters can be low depending on the activity by which they are expelled, according to a risk assessment model using published data on expelled droplets by various activities and *in vitro* estimates of an infectious dose. In a 100m<sup>3</sup> room after 20 minutes of exposure from breathing, speaking, singing, coughing or sneezing by an infected person, at 10<sup>7</sup> RNA copies/mL in mucus, the mean illness risks were estimated to be below 0.1%. Risks exceeded 1% after 2 hours of exposure at 10<sup>8</sup> RNA copies/mL in mucus in the singing, coughing, and sneezing scenarios. Higher air exchanges per hour reduced risks of illness by several factors.

*Schijven et al. (Apr 1, 2021). Quantitative Microbial Risk Assessment for Airborne Transmission of SARS-CoV-2 via Breathing, Speaking, Singing, Coughing, and Sneezing. Environmental Health Perspectives.* <https://doi.org/10.1289/EHP7886>

- The overall incidence of SARS-CoV-2 in-school transmission was 4% during the first 6 weeks of the 2020-2021 academic year in primary and post-primary schools located in Cork and Kerry counties in southwest Ireland, according to government health records. Positivity among students and staff were 3% and 7%, respectively. For roughly every week spent by an index case in school, one secondary case emerged on average. School-related cases accounted for 2% of all notified cases in the region during the observation period. Schools implemented several mitigation measures following reopening, such as use of face coverings, physical distancing, and enhanced cleaning protocols.

*White et al. (Apr 1, 2021). An Investigation into the Rates of Transmission of SARS-CoV-2 during the First 6 Weeks of the 2020–2021 Academic Year in Primary and Post-Primary Schools in Cork and Kerry, Ireland. Irish Journal of Medical Science.* <https://doi.org/10.1007/s11845-021-02577-4>

[4](#)

## Testing and Treatment

- A modified RT-PCR test to detect SARS-CoV-2 RNA in human stool had 100% analytical sensitivity in 20 stool samples freshly spiked with inactivated SARS-CoV-2 material and a lower limit of detection (LLD) of 3,000 viral RNA copies per gram. Analytical sensitivity decreased two-fold after a single freeze-thaw cycle at -80 °C. The assay had 100% sensitivity and specificity when used by a different laboratory to correctly identify 30 stool samples for the presence of SARS-CoV-2. Additionally, SARS-CoV-2 RNA was detected using this assay in the stool and anal swab specimens of 11 of 23 positive individuals.

*Coryell et al. (Mar 31, 2021). A Method for Detection of SARS-CoV-2 RNA in Healthy Human Stool: A Validation Study. The Lancet Microbe.* [https://doi.org/10.1016/S2666-5247\(21\)00059-8](https://doi.org/10.1016/S2666-5247(21)00059-8)

- *[Pre-print, not peer-reviewed]* Neutralizing activity of four experimental monoclonal antibodies (mAbs) (MD65, MD62, MD29 and BL6) targeting the receptor-binding domain (RBD) of SARS-CoV-2 were largely retained against a panel of the top 10 RBD mutations including mutations found in several variants of concern.

Rosenfeld et al. (Apr 1, 2021). *The Neutralization Potency of Anti-SARS-CoV-2 Therapeutic Human Monoclonal Antibodies Is Retained against Novel Viral Variants*. Pre-print downloaded Apr 2 from <https://doi.org/10.1101/2021.04.01.438035>

## Vaccines and Immunity

- [Pre-print, not peer-reviewed] Interim results for the phase 3 clinical trial (n=397) of the SARS-CoV-2 inactivated-virus vaccine CoronaVac (SinoVac BioTech) conducted in Chile indicate the vaccine is safe to use and induces neutralizing antibody production against the SARS-CoV-2 spike protein. Among participants receiving two doses of the vaccine (n=239) or placebo (n=80) 2 weeks apart, no serious adverse events were reported up to 28 days after the second dose, and symptoms resolved within two days. Seroconversion for anti-spike IgG among vaccinated individuals aged 18-59 years was 48% at day 14 and 95% at day 42. Among individuals aged ≥60 years old, seroconversion was 18% at day 14 and 88% at day 42. Neutralizing antibodies were not detected among vaccinated individuals at day 14, but were detected at day 42 in 97% individuals aged 18-59 years and 100% of those age ≥60 years. No significant differences in cell-mediated immunity were observed between the two age groups.

Bueno et al. (Apr 1, 2021). *Interim Report Safety And Immunogenicity Of An Inactivated Vaccine Against Sars-cov-2 In Healthy Chilean Adults In A Phase 3 Clinical Trial*. Pre-print downloaded Apr 2 from <https://doi.org/10.1101/2021.03.31.21254494>

- 4 cases of possible SARS-CoV-2 reinfection characterized by a more severe second episode were identified in a case series in Brazil. In March 2020, all patients recovered from a mild course of COVID-19 and retested with negative PCR results during early April. In the last week of May, all 4 cases reported SARS-CoV-2 symptoms and had higher viral loads and worse clinical symptoms than they did in March. Sequenced genomes from the second episode compared to those obtained in the first episode and prior circulating variants suggest that reinfection was caused by different strains.

Fintelman-Rodrigues et al. (Apr 1, 2021). *Genetic Evidence and Host Immune Response in Persons Reinfected with SARS-CoV-2, Brazil*. *Emerging Infectious Disease Journal*.

[https://wwwnc.cdc.gov/eid/article/27/5/20-4912\\_article](https://wwwnc.cdc.gov/eid/article/27/5/20-4912_article)

- [Pre-print, not peer-reviewed] The SARS-CoV-2 variant CAL.20C (also known as B.1.427/B.1.429, with key mutations S13I, W152C and L452R), which was first described in California, has plasma neutralizing activity that is 3- to 4-fold lower in individuals fully vaccinated with the Moderna or Pfizer-BioNTech vaccines compared to the wild-type SARS-CoV-2 strain. Reduction in neutralizing activity among fully vaccinated individuals with prior SARS-CoV-2 infection was also similar. Neutralizing activity among individuals with prior SARS-CoV-2 infection was reduced 5-fold, but neutralizing activity was reduced to nearly undetectable levels among those with prior infection from the B.1.1.7 variant. The Regeneron monoclonal antibody (mAb) cocktail (casirivimab/imdevimab) maintained neutralizing activity against CAL.20C compared to the wild-type strain, but 14 out of 35 mAbs tested showed reduced neutralization potency. Specifically, all mAbs targeting the N-terminal domain had abolished neutralizing activity, likely as a result of the S13I and W152C mutations.

McCallum et al. (Apr 1, 2021). *SARS-CoV-2 Immune Evasion by Variant B.1.427B.1.429*. Pre-print downloaded Apr 2 from <https://doi.org/10.1101/2021.03.31.437925>

## Clinical Characteristics and Health Care Setting

- Persons diagnosed with COVID-19 and sickle cell disease (SCD) (n=312) were 2-times as likely to be hospitalized and develop pneumonia and 3-times as likely to develop pain compared to a propensity matched cohort of Black persons diagnosed with COVID-19 but without SCD or sickle cell trait (SCT). No significant differences were observed in case mortality between the two groups. No significant differences in COVID-19 outcomes were observed between persons diagnosed with COVID-19 and who have sickle cell trait (SCT) (n=449) and a propensity matched cohort of Black persons diagnosed with COVID-19 but without SCD/SCT.

*Singh et al. (Apr 1, 2021). COVID-19 in Individuals with Sickle Cell Disease/Trait Compared with Other Black Individuals. Blood Advances. <https://doi.org/10.1182/bloodadvances.2020003741>*

## Modeling and Prediction

- Restricting county-level mobility through a stay-at-home-order (SAHO) with 50% compliance could result in a potential reduction of about 33% in daily COVID-19 cases, according to a modeling study. The models used smartphone mobility data and COVID-19 case and death data from March to August 2020 in 1,752 US counties that had at least 100 recorded cases by August 2020, and accounted for socio-demographic characteristics, health indicators and health infrastructure attributes of each county.

*Bhowmik et al. (Apr 1, 2021). A Comprehensive Analysis of COVID-19 Transmission and Mortality Rates at the County Level in the United States Considering Socio-Demographics, Health Indicators, Mobility Trends and Health Care Infrastructure Attributes. PLOS ONE. <https://doi.org/10.1371/journal.pone.0249133>*

## Other Resources and Commentaries

- [SARS-CoV-2 Escape Mutants and Protective Immunity from Natural Infections or Immunizations](#) – Clinical Microbiology and Infection (Mar)
- [Association between Pre-Existing Respiratory Disease and Its Treatment, and Severe COVID-19: A Population Cohort Study](#) – The Lancet Respiratory Medicine (Apr 2)
- [Patient Access to Chronic Medications during the Covid-19 Pandemic: Evidence from a Comprehensive Dataset of US Insurance Claims](#) – PLOS ONE (Apr 1)
- [COVID-19, Unemployment, and Behavioral Health Conditions: The Need for Supported Employment](#) – Administration and Policy in Mental Health and Mental Health Services Research (Mar 31)
- [Mask Mandates, On-Premises Dining, and COVID-19](#) – JAMA (Apr 1)
- [When Planning Meets Reality: COVID-19 Inter-Pandemic Survey of Michigan Nursing Homes](#) – American Journal of Infection Control (Mar)
- [Racism in the USA: Ensuring Asian American Health Equity](#) – The Lancet (Apr 3)
- [Community-Associated Outbreak of COVID-19 in a Correctional Facility – Utah, September 2020–January 2021](#) – MMWR. Morbidity and Mortality Weekly Report (Apr 2)
- [Incidence of Delayed Asymptomatic COVID-19 Recurrences in a 6-Month Longitudinal Study](#) – Journal of Infection (Mar)
- [Vaccine Certificates: Does the End Justify the Means](#) – The Lancet Microbe (Apr 1)
- [Protecting and Expanding Medicaid Access: Confronting Health Disparities Compounded by COVID-19](#) – Population Health Management (Mar 31)
- [The Global Viralization of Policies to Contain the Spreading of the COVID-19 Pandemic: Analyses of School Closures and First Reported Cases](#) – PLOS ONE (Apr 1)

- [COVID-19 and Crime: Analysis of Crime Dynamics amidst Social Distancing Protocols](#) – PLOS ONE (Apr 1)
- [Systems Serology Detects Functionally Distinct Coronavirus Antibody Features in Children and Elderly](#) – Nature Communications (Apr)
- [Prevalence of Symptoms in Patients Discharged from COVID Care Facility of NIMS Hospital: Is RT PCR Negativity Truly Reflecting Recovery? A Single-Centre Observational Study](#) – International Journal of General Medicine (Mar)
- [The Interplay between COVID-19 Restrictions and Vaccination](#) – The Lancet Infectious Diseases (Apr 2)

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