

2019-nCoV Literature Situation Report (Lit Rep) February 16, 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 SARS-CoV-2 B.1.1.7 variant (first described in the UK) showed similar sensitivity to neutralizing activity of convalescent sera and sera from vaccinated individuals compared to the wild-type virus. In contrast, neutralization was lower against the B.1.351 variant (first described in South Africa).** [More](#)
- **There were 66 reports of anaphylaxis following COVID-19 vaccination during December 14, 2020 to January 18, 2021, with 47 cases out of nearly 10 million Pfizer vaccine doses and 19 cases out of nearly 7.6 million Moderna vaccine doses. No deaths from anaphylaxis after vaccination with either vaccine were reported.** [More](#)
- **Pediatric hospital admissions in the US were up to 45% lower in 2020 compared to the past 10 years, according to a cross-sectional study of over 5 million US pediatric hospital admissions. Declines in admission were found for all examined diagnoses except for birth.** [More](#)

Transmission

- Individuals infected with the SARS-CoV-2 B.1.1.7 variant (first described in the UK) may have considerably higher viral loads, which could potentially explain the higher transmissibility of this variant. Analysis of 641 SARS-CoV-2 PCR positive samples in the UK from October to November 2020 showed that samples suspected to have the B.1.1.7 variant, identified by a unique test result profile in which the S-gene is not detected (i.e. S-gene target failure or SGTF), had lower cycle threshold (Ct) counts. Significantly more SGTF samples had higher inferred viral loads between 10^7 to 10^8 , which the authors suggest could translate to median viral loads 10,000-fold higher than non-SGTF samples. *Kidd et al. (Feb 13, 2021). S-Variant SARS-CoV-2 Lineage B1.1.7 Is Associated with Significantly Higher Viral Loads in Samples Tested by ThermoFisher TaqPath RT-QPCR. The Journal of Infectious Diseases.* <https://doi.org/10.1093/infdis/jiab082>

Geographic Spread

- Whole genome sequencing of 12,754 SARS-CoV-2 sequences from the US suggests the presence of 4 substrains and 11 most frequent mutations as of September 11, 2020. The 2 most common mutations are also the top 2 in the world (D614G mutation in the spike protein and the P323L mutation), both of which were detected in the US in February 2020. The authors note that the S24L mutation, which was the 11th most frequent in the US and likely originated in the US, has unusually strong gender distribution, occurring more frequently in females. The authors suggest that their

analysis indicates that two of four SARS-CoV-2 substrains in the US may become more infectious due to the mutations they have acquired.

Wang et al. (Feb 2021). Analysis of SARS-CoV-2 Mutations in the United States Suggests Presence of Four Substrains and Novel Variants. Communications Biology.

<https://www.nature.com/articles/s42003-021-01754-6>

Testing and Treatment

- Antibodies against SARS-CoV-2 were detected in 75% (365 of 486) of patients in a University of California health system with PCR-confirmed SARS-CoV-2 who subsequently underwent antibody testing a median of 34 days later (IQR: 3-64 days). Seropositivity was associated with a longer delay between PCR and antibody testing, with sensitivity reaching 75% at 112 days after the positive PCR result. Sensitivity varied significantly by test type, with the Beckman Coulter IgG test having the highest maximum sensitivity of 84%. Sensitivity was significantly higher among males (79%; peak at 126 days after PCR test) and among patients aged 50-59 years (87%). The authors note that these findings suggest that measuring serological levels too soon after SARS-CoV-2 infection might lead to an incorrect assessment of immune response.

Vashisht et al. (Feb 12, 2021). Age- and Sex-Associated Variations in the Sensitivity of Serological Tests Among Individuals Infected With SARS-CoV-2. JAMA Network Open.

<https://doi.org/10.1001/jamanetworkopen.2021.0337>

Vaccines and Immunity

- The CDC identified 66 reports of anaphylaxis from the Vaccine Adverse Event Reporting System (VAERS) during December 14, 2020 to January 18, 2021 (47 cases out of nearly 10 million Pfizer vaccine doses and 19 cases out of nearly 7.6 million Moderna vaccine doses). All cases were treated in healthcare settings, and no deaths from anaphylaxis after vaccination with either vaccine were reported. CDC physician reviewers concluded that the clinical characteristics of anaphylaxis cases following both vaccines were similar. 32% (22 of 66) of case reports noted prior episodes of anaphylaxis from other exposures, including other vaccines, drugs, or food. [EDITORIAL NOTE: This article includes updated results of analyses summarized in the Lit Rep on January 2 and January 22, 2021.]

Shimabukuro et al. (Feb 12, 2021). Reports of Anaphylaxis After Receipt of MRNA COVID-19 Vaccines in the US—December 14, 2020-January 18, 2021. JAMA.

<https://doi.org/10.1001/jama.2021.1967>

- There may be a distinct threshold of immune activity, defined by the level of antibodies, in response to SARS-CoV-2 infection that is required to elicit a vigorous humoral and cellular response necessary to prevent subsequent re-infection. These conclusions were based on a community-based surveillance study of 120 SARS-CoV-2 convalescent patients, which found that sustained functional humoral responses were mostly observed in individuals who had antibody titers to the SARS-CoV-2 receptor binding domain (RBD) that were above a certain threshold. The authors note that unlike mild/asymptomatic natural infection, vaccine boosting is likely to result in the induction of broad robust protective immunity.

Bartsch et al. (Feb 2021). Discrete SARS-CoV-2 Antibody Titers Track with Functional Humoral Stability. Nature Communications. <https://www.nature.com/articles/s41467-021-21336-8>

- In a cohort of 17 SARS-CoV-2 PCR-positive pregnant women followed from the end of the first trimester to delivery, IgG non-neutralizing antibodies (nNAbs) were detected in 71% (12 of 17),

while neutralizing antibodies (NAbs) were detected in 53% of individuals (9 of the 12 who seroconverted with IgG nNAbs). Levels of NAbs remained stable throughout pregnancy. In contrast, nNAbs declined over the pregnancy, with a statistically significant decrease observed by week 16.

Cosma et al. (Feb 2, 2021). Longitudinal Analysis of Antibody Response Following SARS-CoV-2 Infection in Pregnancy: From the First Trimester to Delivery. Journal of Reproductive Immunology. <https://doi.org/10.1016/j.jri.2021.103285>

- *[Pre-print, not peer reviewed]* The SARS-CoV-2 B.1.1.7 variant (first described in the UK) was experimentally shown to have similar sensitivity to the neutralizing activity of convalescent sera (n=83) collected up to 9 months post symptom onset compared to the wild-type virus. In contrast, neutralizing titers had a mean 6-fold reduction against the B.1.351 variant (first described in South Africa) and a loss of neutralizing activity in 40% of convalescent sera at 9 months post symptom onset.
- Among sera from 19 vaccinees collected at various timepoints during the vaccination regimen, neutralizing titers were lower against the B.1.1.7 variant and to a greater extent against the B.1.351 variant compared to the wild-type virus. After the second dose, at a 1/30 serum dilution, 80% of sera neutralized the wild-type and the B.1.1.7 variant but only 60% neutralized the B.1.351 variant.
- No neutralizing activity against the wild-type virus and the variants was detected in the nasal swabs from the vaccinees 2-3 weeks post vaccination, except among 3 vaccinees who had a history of SARS-CoV-2 infection. Neutralizing activity was similar for the wild-type virus and B.1.1.7 variant, but was absent for the B.1.351 variant.

Planas et al. (Feb 12, 2021). Sensitivity of Infectious SARS-CoV-2 B.1.1.7 and B.1.351 Variants to Neutralizing Antibodies. Pre-print downloaded Feb 16 from <https://doi.org/10.1101/2021.02.12.430472>

- Anti-SARS-CoV-2 antibodies were detected in 85% of 119 samples collected from 88 COVID-19 convalescent donors within 4 weeks post symptom onset. IgM/IgA levels declined after 1 month, while IgG levels remained relatively stable and were detected in 80% of samples up to 6-8 months irrespective of disease severity. SARS-CoV-2-specific memory B- and T-cell responses developed over time and were detected in all patients up to 6-8 months.

Sherina et al. (Feb 2021). Persistence of SARS-CoV-2 Specific B- and T-Cell Responses in Convalescent COVID-19 Patients 6-8 Months after the Infection. Med. <https://doi.org/10.1016/j.medj.2021.02.001>

Modeling and Prediction

- The test-positive proportion (TPP), the proportion of tested individuals who have tested positive, may be informative in predicting trends in COVID-19 incidence. The TPP strongly correlated with incidence in simulation results, as long as testing resources were sufficient to cover symptomatic and asymptomatic testing up to 35 days. However, the correlation between TPP and incidence weakened as variance of testing availability increased.

Hitchings et al. (Feb 12, 2021). The Usefulness Of SARS-CoV-2 Test-Positive Proportion As A Surveillance Tool. American Journal of Epidemiology. <https://doi.org/10.1093/aje/kwab023>

Public Health Policy and Practice

- The proportion of preterm deliveries (< 37 weeks) and stillbirths was similar in the Castilla-y-Leon region in Spain during the COVID-19 lockdown and de-escalation periods (March 15 to June 21,

2020) compared to previous time periods. The proportion of preterm deliveries during the lockdown was 6.5%, compared to 6.6% during the whole pre-lockdown period (January 1, 2015 to March 14, 2020) and 6.2% during pre-lockdown comparison time periods (March 15 to May 3, 2015-2019). Results were stable even when different gestational age categories and birthweight categories were considered. Proportion of stillbirths during the lockdown and pre-lockdown comparison time periods were 0.33% and 0.34%, respectively.

Arnaez et al. (Feb 12, 2021). Lack of Changes in Preterm Delivery and Stillbirths during COVID-19 Lockdown in a European Region. European Journal of Pediatrics.

<https://doi.org/10.1007/s00431-021-03984-6>

- *[Pre-print, not peer-reviewed]* An assessment of 158 COVID-19 data dashboards from 53 countries by an international panel of experts (n=17) found that only 20 dashboards (13%) were highly actionable. Key characteristics of actionable dashboards according to the expert panel include knowing the intended audience and information needs, reporting data sources and methods clearly, and linking time trends to policy decisions. A majority of the dashboards were government developed (63%) and had a national scope (60%).

Ivanković et al. (Feb 12, 2021). What Makes COVID-19 Dashboards Actionable? Descriptive Assessment and Expert Appraisal of 158 Public, Web-Based COVID-19 Dashboards (Preprint). Journal of Medical Internet Research. <https://doi.org/10.2196/25682>

- In a cross-sectional survey of homeless shelters in France from March to April 2020 (n=698), 49 people (7%) overall tested positive for SARS-CoV-2. Although positivity correlated with symptoms, over half of positive patients reported being asymptomatic. Young age (18-34 years, OR=3.8) and being housed in one specific shelter (OR=9.1) were associated with higher SARS-CoV-2 positivity. Acceptance towards testing was high (79%).

Ly et al. (Feb 5, 2021). Screening of SARS-CoV-2 among Homeless People, Asylum-Seekers and Other People Living in Precarious Conditions in Marseille, France, March–April 2020.

International Journal of Infectious Diseases. <https://doi.org/10.1016/j.ijid.2021.02.026>

- US pediatric hospital admissions in the US were lower in 2020 compared to the past 10 years, according to a cross-sectional study of over 5 million US pediatric hospital admissions at 49 hospitals in the Pediatric Health Information Systems database. There was a decrease in the number of admissions beginning in March 2020 compared with the period from 2010 to 2019, reaching a peak reduction of 45% in April 2020. Inflation-adjusted hospital charges in the second quarter of 2020 decreased 28% compared with prior years, and there were significant reductions in all examined diagnoses except for birth.

Pelletier et al. (Feb 12, 2021). Trends in US Pediatric Hospital Admissions in 2020 Compared With the Decade Before the COVID-19 Pandemic. JAMA Network Open.

<https://doi.org/10.1001/jamanetworkopen.2020.37227>

Other Resources and Commentaries

- [COVID-19 and the Collapse of Global Trade: Building an Effective Public Health Response](#) – The Lancet Planetary Health (Feb 1)
- [Indirect HIV Morbidity and Mortality Due to COVID-19](#) – Clinical Infectious Diseases (Feb 13)
- [Addressing COVID-19 Health Disparities through a Regional Community Health Response](#) – Cleveland Clinic Journal of Medicine (Feb 12)

- [Shifting Coronavirus Disease 2019 Testing Policy and Research to Include the Full Translation Pipeline](#) – Open Forum Infectious Diseases (Feb 1)
- [The Risk of Resurgence in Vaccine Preventable Infections Due to COVID-Related Gaps in Immunization](#) – Clinical Infectious Diseases (Feb 13)
- [Barriers to Vaccination for COVID-19 Control – Experience from the United States](#) – Global Health Journal (Feb 9)
- [SARS-CoV-2 Variants and Ending the COVID-19 Pandemic](#) – The Lancet (Feb 11)
- [SARS-CoV-2, Covid-19, and the Debunking of Conspiracy Theories.](#) – Reviews in Medical Virology (Feb 14)
- [Caring for the Caregivers – Covid-19 Vaccination for Essential Members of the Health Care Team](#) – New England Journal of Medicine (Feb 12)
- [How ‘Killer’ T Cells Could Boost COVID Immunity in Face of New Variants](#) – Nature (Feb 12)
- [Uncovering Ways That Emerging SARS-CoV-2 Lineages May Increase Transmissibility](#) – The Journal of Infectious Diseases (Feb 13)
- [Ensure Palestinians Have Access to COVID-19 Vaccines](#) – The Lancet (Feb 9)
- [Supplements for the Treatment of Mild COVID-19](#)—Challenging Health Beliefs With Science From A to Z – JAMA Network Open (Feb 12)
- [Home Testing for COVID-19: Benefits and Limitations](#) – Cleveland Clinic Journal of Medicine (Feb 12)
- [Priorities for the COVID-19 Pandemic at the Start of 2021: Statement of the Lancet COVID-19 Commission](#) – The Lancet (Feb 12)
- [Indoor versus Outdoor Transmission of SARS-COV-2: Environmental Factors in Virus Spread and Underestimated Sources of Risk](#) – Euro-Mediterranean Journal for Environmental Integration (Feb 10)
- [The US Regulatory System and COVID-19 Vaccines](#) – JAMA (Feb 15)
- [Covid-19: Is Manaus the Final Nail in the Coffin for Natural Herd Immunity?](#) – BMJ (Feb 12)
- [Challenges in ensuring global access to COVID-19 vaccines: production, affordability, allocation, and deployment](#) – The Lancet (Feb 12)

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