

2019-nCoV Literature Situation Report (Lit Rep)

January 27, 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 variant B.1.351 (South Africa) showed some resistance to neutralization by certain monoclonal antibodies, convalescent plasma, and sera from people who had received the Pfizer or Moderna vaccines. The B.1.1.7 (UK) variant also showed some resistance to neutralization, but to a lesser extent.** [More](#)
- **Findings from a systematic review show that global vaccination coverage and total number of vaccines administered declined during the COVID-19 pandemic.** [More](#)
- **A diagnosis of a schizophrenia spectrum disorder was associated with an increased risk of 45-day mortality among adults who tested positive for SARS-CoV-2. Neither mood disorders nor anxiety were associated with 45-day mortality.** [More](#)

Transmission

- Two SARS-CoV-2 outbreaks in April, 2020 were identified among office workers in Washington, DC. The study identified two factors potentially associated with SARS-CoV-2 infection and transmission in the workplace: a significantly higher percentage of seropositive participants lived with someone who had a confirmed positive test result (13%) than those who were seronegative (1%), and more (60% vs. 32%) seropositive participants traveled by taxi after the cancellation of nonessential gatherings on March 11, 2020. There was no significant difference in workplace mitigation activities between seropositive and seronegative participants, including using a face covering most of the time or always, maintaining a distance of ≥ 6 feet, and washing hands or using hand sanitizer ≥ 5 times per day.

Sami et al. (Feb 24, 2021). SARS-CoV-2 Infection and Mitigation Efforts among Office Workers, Washington, DC, USA. Emerging Infectious Diseases. <https://doi.org/10.3201/eid2702.204529>

Vaccines and Immunity

- *[Pre-print, not per-reviewed]* The SARS-CoV-2 variant B.1.1.7 (UK) was resistant to neutralization by several monoclonal antibodies (mAbs) targeting either the N-terminal domain (NTD) of the virus's spike protein or its receptor-binding domain (RBD). This variant was also modestly more resistant to neutralization with convalescent plasma (about 3 fold) and sera from people who had received the Pfizer or Moderna vaccines (about 2 fold). The B.1.351 (South Africa) variant resisted neutralization by most NTD mAbs, multiple individual mAbs directed against the RBD, convalescent plasma (about 11-33 fold), and sera from vaccinated people (about 6.5-8.6 fold). The authors note that loss of

neutralizing activity against the B.1.1.7 variant is unlikely to have an adverse impact, while the reduction in activity levels against the B.1.351 variant were potentially concerning.

Wang et al. (Jan 26, 2021). Increased Resistance of SARS-CoV-2 Variants B.1.351 and B.1.1.7 to Antibody Neutralization. Pre-print downloaded January 27 from <https://doi.org/10.1101/2021.01.25.428137>

- *[Pre-print, not per-reviewed]* A longitudinal study of people who had recovered from COVID-19 (n=963) estimated a half-life of 7.7 months for anti-spike IgG and a half-life of 8.7 months for serum neutralization, with only 13% of individuals losing seroreactivity at ten months. In addition, around 3% of recovered patients demonstrated effective cross-neutralizing IgG antibodies to SARS-CoV-1 without known prior exposure to the virus. Key factors in predicting the development of SARS-CoV-2 neutralizing activity in mild cases were seroreactivity, age, time since disease onset, and fever.

Vanshylla et al. (Jan 26, 2021). Kinetics and Correlates of the Neutralizing Antibody Response to SARS-CoV-2. Pre-print downloaded January 27 from <https://doi.org/10.1101/2021.01.26.428207>

- *[Pre-print, not per-reviewed]* A retrospective cohort study of electronic health record data from the National Health System in England from 23.4 million patients using the OpenSAFELY-TPP platform found that between December 8 and January 13, 2021, a total of 961,580 people received a COVID-19 vaccine. Of 1,160,062 patients aged 80 or over and not living in a care home, 41% had been vaccinated. Within this group, there were substantial differences in vaccination by ethnicity (white 43% vaccinated, Black 21%) and across rankings of deprivation (least deprived 45%, most deprived 38%). In the 70-79 age cohort, 4% had been vaccinated. Among those age 65-70 who were care home residents the vaccine coverage was 33%. Of all those vaccinated, 18% (169,472 persons) had received a second dose.

MacKenna et al. (Jan 26, 2021). Trends Regional Variation and Clinical Characteristics of COVID-19 Vaccine Recipients a Retrospective Cohort Study in 23.4 Million Patients Using OpenSAFELY. Pre-print downloaded January 27 from <https://doi.org/10.1101/2021.01.25.21250356>

- A study of SARS-CoV-2 infection waves in England noted different regional distributions of infections during the first (March-September 2020) and second (September 2020-onward) waves, with regions that experienced high mortality in the first wave experiencing lower mortality in the second. Greater first wave severity was also associated with slower second wave growth rate. Possible explanations for these trends put forth by the authors were changes in the demographics of the subpopulations sampled by testing, increased social distancing behaviors, or changes in population immunity.

Brookes et al. (Jan 26, 2021). Non-Congruent SARS-CoV-2 Waves in England. Pre-print downloaded January 27 from <https://doi.org/10.1101/2021.01.25.21250440>

- A molecular study of SARS-CoV-2 found that the virus's spike protein was able to bind to biliverdin and bilirubin, products of heme metabolism. The authors identified the phenomenon after observing a green pigment in protein precipitate of recombinant SARS-CoV-2 spike produced in human cell lines. Binding to biliverdin inhibited the ability of immune sera and a subset of monoclonal antibodies to neutralize the virus. The study findings suggest that the spike N-terminal domain (NTD), a key site for antibody binding, is a dynamic and flexible region, and that interaction with biliverdin can cause conformational changes in the NTD such that it may evade the immune response. Spike protein isolated from endemic coronaviruses (NL63 and OC43) did not have similar properties.

Rosa et al. (Jan 26, 2021). SARS-CoV-2 Recruits a Haem Metabolite to Evade Antibody Immunity. Pre-print downloaded January 27 from <https://doi.org/10.1101/2021.01.21.21249203>

Clinical Characteristics and Health Care Setting

- Diagnosis of a schizophrenia spectrum disorder was significantly associated with increased risk of 45-day mortality among adults who tested positive for SARS-CoV-2, after adjusting for demographic and medical risk factors (OR=2.7). The retrospective cohort study enrolled 7,348 individuals at a large medical system in New York, 75 (1%) of whom had a history of a schizophrenia spectrum illness, 564 (8%) who had a history of a mood disorder, and 360 (5%) with a history of an anxiety disorder. Diagnoses of mood (OR=1.14) and anxiety disorders (OR=0.96) were not associated with mortality after adjustment.

Nemani et al. (Jan 27, 2021). Association of Psychiatric Disorders With Mortality Among Patients With COVID-19. JAMA Psychiatry. <https://doi.org/10.1001/jamapsychiatry.2020.4442>

- *[Pre-print, not per-reviewed]* A study of SARS-CoV-2 in pregnant women showed that in pregnant women with COVID-19, ACE2 is widely expressed in the placenta at term compared to low levels of expression in noninfected mothers. Despite the *in vitro* susceptibility of cytotrophoblasts (a type of placental cell) to SARS-CoV-2 infection, viral RNA was detected in the placentas of only around 13% of women in the cohort, including those with severe disease and high viral loads. Bulk transcriptomic analysis of the placenta demonstrated clear differences in the expression of genes associated with immune responses, which the authors suggested could represent immune activation at the placenta even in the absence of detectable virus. However, only minor histological differences (an increase intervillous fibrin in the placentas from COVID-infected women) were observed when comparing the placentas from COVID-infected women to controls.

Lu-Culligan et al. (Jan 26, 2021). SARS-CoV-2 Infection in Pregnancy Is Associated with Robust Inflammatory Response at the Maternal-Fetal Interface. Pre-print downloaded January 27 from <https://doi.org/10.1101/2021.01.25.21250452>

- A study of the serologic response to SARS-CoV-2 infection in pregnant women (n = 88) found that asymptomatic pregnant women mounted a lower immune response than symptomatic pregnant women, and that maternal IgG antibodies were positively correlated with levels in neonates. Maternal IgM and IgG levels peaked around 15 and 30 days after onset of symptoms, respectively. Passive transfer of IgG was identified in 78% of all neonates.

Kubiak et al. (Jan 2021). SARS-CoV-2 Serology Levels in Pregnant Women and Their Neonates. American Journal of Obstetrics and Gynecology. <https://doi.org/10.1016/j.ajog.2021.01.016>

- Among patients with COVID-19 in The Netherlands who required mechanical ventilation in the ICU, higher BMI was not associated with differences in measurements of plasma cytokines or clinical outcomes. Patients (n=67) were classified as obese (BMI ≥ 30 kg/m²) and non-obese (BMI < 30 kg/m²). Obese participants had a lower elevation in body temperature (38.1C vs. 38.7C) but no other clinical differences between the groups were observed, including differences in time on ventilator, ICU length of stay, or 40-day mortality. BMI did not correlate with plasma levels of cytokines including IL-6, IL-8, TNF, MCP-1, IL-1RA, or IP-10.

Kooistra et al. (Jan 25, 2021). A Higher BMI Is Not Associated with a Different Immune Response and Disease Course in Critically Ill COVID-19 Patients. International Journal of Obesity. <https://doi.org/10.1038/s41366-021-00747-z>

Public Health Policy and Practice

- 23% of first responders in New York City tested positive for SARS-CoV-2 antibodies during May-July 2020, with seroprevalence highest among correctional staff (39%) and emergency medical technicians (38%) and lowest in laboratory technicians (10%) and medicolegal death investigators (11%). Associations were found between seropositivity and exposure to a SARS-CoV-2 positive household member (aOR=3.5), non-Hispanic Black race or ethnicity (aOR=1.5), and severe obesity (aOR=1.3). Consistent glove use was paradoxically associated with increased likelihood of seropositivity (aOR=1.2) which the authors attributed to cross-contamination and improper hand hygiene after glove use; use of other personal protective equipment had no association with seropositivity.

Sami et al. (Jan 25, 2021). Prevalence of SARS-CoV-2 Antibodies in First Responders and Public Safety Personnel, New York City, New York, USA, May-July 2020. Emerging Infectious Diseases. https://wwwnc.cdc.gov/eid/article/27/3/20-4340_article

- A systematic review of 17 studies examining the impact of the COVID-19 pandemic on existing global vaccination programs found a reduction in vaccination coverage and a decline in the total number of vaccines administered. Polio cases increased by about fourfold in polio endemic countries. Factors contributing to low vaccine coverage included fear of being exposed to the virus at health care facilities, restriction on city-wide movements, shortage of workers, and diversion of resources from child health to address the pandemic. 10 of these studies focused on campaigns in high-income countries.

Lassi et al. (Jan 22, 2021). The Impact of the COVID-19 Pandemic on Immunization Campaigns and Programs: A Systematic Review. International Journal of Environmental Research and Public Health. <https://doi.org/10.3390/ijerph18030988>

- Survey participants with disabilities who live outside of metropolitan areas had the lowest COVID-19 information trust ratings and reported significantly less trust in most information sources when compared to people with disabilities in either metropolitan or micropolitan counties. Increased compliance with CDC guidelines was associated with being over 65, identifying as female, and higher general trust scores. Decreased compliance with CDC guidelines was associated with being nonwhite, living in a nonmetropolitan area, higher trust scores in President Trump, and having a communication disability.

Ipsen et al. (Jan 2021). A Cross-Sectional Analysis of Trust of Information and COVID-19 Preventative Practices among People with Disabilities. Disability and Health Journal. <https://doi.org/10.1016/j.dhjo.2021.101062>

Other Resources and Commentaries

- [Systemic Racism and Overcoming My COVID-19 Vaccine Hesitancy](#) – EClinicalMedicine (Jan 2021)
- [Cross-Country Evidence on the Association between Contact Tracing and COVID-19 Case Fatality Rates](#) – Scientific Reports (Dec 25 2021)
- [Data and Policy to Guide Opening Schools Safely to Limit the Spread of SARS-CoV-2 Infection](#) – JAMA (Jan 26 2021)
- [The Experience of Teleworking with Dogs and Cats in the United States during COVID-19](#) – Animals (Jan 21 2021)
- [Covid-19: Moderna Plans Booster Doses to Counter Variants](#) – BMJ (Jan 26 2021)
- [Youth Mask-Wearing and Social-Distancing Behavior at In-Person High School Graduations During the COVID-19 Pandemic](#) – Journal of Adolescent Health (Jan 2021)
- [Why Did the World's Pandemic Warning System Fail When COVID Hit?](#) – Nature (Jan 28 2021)

- [Understanding the Public Discussion about the CDC in the COVID-19 Pandemic: A Text-Mining Analysis of Twitter Data](#) – Journal of Medical Internet Research (Jan 2021)
- [What Can We Learn from Israel’s Rapid Roll out of COVID 19 Vaccination?](#) – Israel Journal of Health Policy Research (Jan 2021)
- [Audio Interview: Covid-19 in South Africa and a New SARS-CoV-2 Variant](#) – The New England Journal of Medicine (Jan 2021)
- [Israel’s Rapid Rollout of Vaccinations for COVID-19](#) – Israel Journal of Health Policy Research (Dec 26 2021)
- [Severe SARS-CoV-2 Placenta Infection Can Impact Neonatal Outcome in the Absence of Vertical Transmission](#) – Journal of Clinical Investigation (Jan 26 2021)
- [Dark Web Marketplaces and COVID-19: Before the Vaccine](#) – EPJ Data Science
- [Biden’s Ambitious COVID Plan: What Scientists Think](#) – Nature (Jan 26 2021)
- [Review on Up-to-Date Status of Candidate Vaccines for COVID-19 Disease](#) – Infection and Drug Resistance (Jan 2021)

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