



2019-nCoV Literature Situation Report (Lit Rep)

May 3, 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 & Johnson/Janssen vaccine showed a real-world effectiveness of 76.7% in preventing SARS-CoV-2 infection at least two weeks after vaccination among patients in the Mayo Clinic Health system, according to an analysis of data between February 27th and April 14th, 2021. [More](#)**
- 📄 **College students in Washington State generally reported strong adherence to most CDC COVID-19 preventive behavioral guidelines, including mask-wearing and disinfecting surfaces, but significantly underestimated the extent to which other, “typical” young adults adhered to guidelines. [More](#)**
- 📄 **An analysis of B and T cell responses in healthcare workers who received one dose of the Pfizer-BioNTech vaccine found that individuals with prior infection had enhanced T cell immunity and neutralizing antibodies effective against the B.1.1.7 and B.1.351 variants, while those without prior infection had reduced immunity against variants. [More](#)**
- 📄 **Nearly half of patients with cancer in a study in France showed no anti-spike antibody response four weeks after one dose of the Pfizer-BioNTech vaccine, with age older than 65 and chemotherapy treatment associated with no seroconversion. [More](#)**

Non-Pharmaceutical Interventions

- Young adult college students at the University of Washington (n = 539) reported strong adherence to most CDC COVID-19 preventive behavioral guidelines, including mask-wearing in public (97.5%) and cleaning high-touch surfaces (61.7%), but perceived significantly lower adherence among their peers for all 14 behaviors assessed, according to a survey conducted in September 2020. Participants perceived the lowest adherence by their peers to avoiding social gatherings such as those at friends’ houses (37.9%). Participants who felt that peers adhered more strongly to guidelines tended to self-report more adherence, while those who perceived peers’ adherence to be lower also reported lower adherence to guidelines. The study found that overall, young adults significantly underestimated the extent to which other, “typical” young adults adhered to guidelines.

Graupensperger et al. (May 2021). Young Adults Underestimate How Well Peers Adhere to COVID-19 Preventive Behavioral Guidelines. The Journal of Primary Prevention.

<https://doi.org/10.1007/s10935-021-00633-4>



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- A modeling study of noncompliance with measures aimed at limiting SARS-CoV-2 transmission found that a portion of the population that is noncompliant can result in extensive endemic disease in the long-term after a return to pre-pandemic activity. Using game theory to assess whether noncompliance is perceived as beneficial to individuals, the authors found that for interventions that are effective at preventing disease spread, the consequences of noncompliance are more often borne by noncompliant individuals.

Stoddard et al. (Dec 30, 2021). Individually Optimal Choices Can Be Collectively Disastrous in COVID-19 Disease Control. BMC Public Health. <https://doi.org/10.1186/s12889-021-10829-2>

Transmission

- In a study in England of all sequenced positive SARS-CoV-2 test results between October 1 – December 15, 2020, odds of household clustering with the SARS-CoV-2 B.1.1.7 variant was 1.9-fold higher than with wildtype virus, after adjusting for Index of Multiple Deprivation, region of residence, time of testing, age group, sex, race, and ethnicity of the index case. Household clusters were defined as a sequenced index case followed by one or more laboratory confirmed SARS-CoV-2 cases at the same private dwelling unit within 14 days. Higher odds of clustering were found in less deprived households and lower odds when the index case was age 70 years or older.

Chudasama et al. (Apr 2021). Household Clustering of SARS-CoV-2 Variant of Concern B.1.1.7 (VOC-202012-01) in England. Journal of Infection. <https://doi.org/10.1016/j.jinf.2021.04.029>

- The household secondary attack rate (SAR = 0.15) among pediatric index cases under age 18 (n = 17) was significantly lower than the rate among 126 adult (SAR = 0.38) index cases, according to findings from a seroprevalence study among 150 households in Germany with at least one confirmed case of SARS-CoV-2 since June 2020. In 84 (56%) households, no transmission was detected, while in 35/150 (23%) households, all household members were seropositive. Households with children and adolescents were significantly less likely to have all seropositive household members compared to households without children.

Galow et al. (Apr 2021). Lower Household Transmission Rates of SARS-CoV-2 from Children Compared to Adults. Journal of Infection. <https://doi.org/10.1016/j.jinf.2021.04.022>

Geographic Spread

- A summary of circulating SARS-CoV-2 mutations in 383,570 complete sequences with known sampling dates in the Global Initiative of Sharing All Influenza Data (GISAID) through April 5, 2021 showed that high incidence of COVID-19 often paralleled high numbers of new mutations and SARS-CoV-2 variant strains. The summary included data from ten countries: the United Kingdom, South Africa, Brazil, USA, India, Russia, France, Spain, Germany, and China. Among approximately 180 novel mutations, some previously reported mutations waned and some increased in prevalence over time, including the B.1.1.7 and B.1.351, and P.1 and P.2 variants.

Weber et al. (May 2021). SARS-CoV-2 Worldwide Replication Drives Rapid Rise and Selection of Mutations across the Viral Genome: A Time-Course Study - Potential Challenge for Vaccines and Therapies. EMBO Molecular Medicine. <https://doi.org/10.15252/emmm.202114062>

Testing and Treatment

- A comparison of the diagnostic performance of seven antigen-detecting rapid diagnostic tests (Ag-RDTs, both lateral flow immunochromatographic tests and fluorescent immunoassay tests) in

real-world hospital settings found a wide range of sensitivity estimates by test brand (range 66.0–93.8%) and cycle threshold (Ct) cut-off values (Ct < 25: 96.2%; Ct 30-35: 31.1%), with an optimal Ct cutoff of 29 to maximize sensitivity. The authors concluded that routine use of these tests may be helpful in situations where high volumes of specimens are tested daily, but performance of commercially available tests may differ substantially.

Bruzzone et al. (Apr 2021). Comparative Diagnostic Performance of Different Rapid Antigen Detection Tests for COVID-19 in the Real-World Hospital Setting. International Journal of Infectious Diseases. <https://doi.org/10.1016/j.ijid.2021.04.072>

Vaccines and Immunity

- *[Pre-print, not peer-reviewed]* The Johnson & Johnson/Janssen vaccine showed a real-world effectiveness of 76.7% in preventing SARS-CoV-2 infection at least two weeks after vaccination among patients in the Mayo Clinic Health system, according to an analysis comparing the infection rate among 2,195 individuals who received the vaccine to that among 21,950 unvaccinated, propensity-matched individuals between February 27th and April 14th, 2021. Of 1,779 vaccinated individuals with at least two weeks of follow-up, only 3 (0.17%) tested positive on day 15 or later after vaccination compared to 128 of 17,744 (0.72%) unvaccinated individuals, corresponding to a 4.3-fold reduction in cumulative incidence. The authors note that at the time of the study, there were not enough hospitalizations, ICU admissions, or deaths within the cohort to assess the effect of the vaccine on COVID-19 severity.

Corchado-Garcia et al. (Apr 30, 2021). Real-World Effectiveness of Ad26.COV2.S Adenoviral Vector Vaccine for COVID-19. Pre-print downloaded May 3 from <https://doi.org/10.1101/2021.04.27.21256193>

- Nearly half of patients with cancer (CP) at a hospital in France showed no anti-spike antibody response four weeks after one dose of the Pfizer-BioNTech vaccine, while 100% of healthcare workers (HCW) vaccinated at the same time (between February 17 and March 18, 2021) had developed anti-spike antibodies (seroconversion). Anti-S IgG titers were also significantly higher in HCWs than among seropositive CPs (680 vs 315 UA/mL). Age older than 65 (aOR = 3.6) and chemotherapy treatment (aOR = 4.3) were associated with lack of seroconversion among CP. No symptomatic COVID-19 cases occurred between the two doses in either CPs or HCWs.

Palich et al. (Apr 2021). Weak Immunogenicity after a Single Dose of SARS-CoV-2 MRNA Vaccine in Treated Cancer Patients. Annals of Oncology. <https://doi.org/10.1016/j.annonc.2021.04.020>

- *[Pre-print, not peer-reviewed]* An analysis of longitudinal serum samples collected from U.S. active duty service members, dependents, and military retirees with PCR-confirmed SARS-CoV-2 infection between March 2020 and March 2021 found 100% seropositivity among inpatients followed for six months (58/58) to one year (8/8). Seroreversion was observed in 5% (9/192) of outpatients six to ten months after symptom onset, and 18% (2/11) of outpatients followed for one year. In both groups, the half-life of anti-SARS-CoV-2 binding-IgG responses was >1000 days post-symptom onset. Older age was positively correlated with both higher IgG binding and neutralizing antibody levels, after controlling for COVID-19 hospitalization status.

Laing et al. (May 2, 2021). SARS-CoV-2 Antibodies Remain Detectable 12 Months after Infection and Antibody Magnitude Is Associated with Age and COVID-19 Severity. Pre-print downloaded May 3 from <https://doi.org/10.1101/2021.04.27.21256207>

- An analysis of B and T cell responses in healthcare workers who received one dose of the Pfizer-BioNTech vaccine showed that individuals with prior infection had enhanced T cell immunity and neutralizing antibodies effective against the B.1.1.7 and B.1.351 variants, while those without prior infection showed reduced immunity against variants. B.1.1.7 and B.1.351 spike mutations resulted in increased or unchanged T cell responses depending on human leukocyte antigen (HLA) polymorphisms. The authors concluded that one dose of the vaccine achieves similar levels of S1 RBD binding antibodies to two doses in vaccinated individuals who had not been infected, and among individuals who had been infected and received one dose, the second dose offered no additional immune enhancement.

Reynolds et al. (Apr 2021). *Prior SARS-CoV-2 Infection Rescues B and T Cell Responses to Variants after First Vaccine Dose*. *Science*. <https://doi.org/10.1126/science.abh1282>

- A case series of 12 patients in the US who experienced cerebral venous sinus thrombosis (CVST) with thrombocytopenia following the Johnson & Johnson/Janssen vaccine found that all patients were women under the age of 60 who began experiencing symptoms that required hospitalization between 6 and 15 days after vaccination. Seven patients had at least 1 CVST risk factor, including obesity (n = 6), hypothyroidism (n = 1), and oral contraceptive use (n = 1). Among 11 patients tested for heparin-induced thrombocytopenia (HIT) antibodies, all were positive, and none had documented prior heparin exposure. As of April 12, 2021, reported outcomes were death (n = 3), intensive care unit (ICU) care (n = 3), non-ICU hospitalization (n = 2), and discharge to home (n = 4).

See et al. (Apr 2021). *US Case Reports of Cerebral Venous Sinus Thrombosis With Thrombocytopenia After Ad26.COVS.5 Vaccination, March 2 to April 21, 2021*. *JAMA*. <https://doi.org/10.1001/jama.2021.7517>

Mental Health and Personal Impact

- A study of pediatric emergency department (ED) mental health (MH) visits found that although the mean number of monthly visits significantly decreased during the COVID-19 pandemic (from 339 to 261 visits per month), the proportion of ED visits for MH conditions significantly increased (from 4.0% to 5.7%). Data were collected from electronic medical records of 11,490 patients aged 5 to 24 years between January 1, 2018, and January 1, 2021. Patients with ED MH visits before the pandemic were significantly more likely than those with visits after the pandemic to be female (56.8% to 62.6%), white (34.8% to 39.5%), and older than 12 years of age (70.7% to 77.6%). Patients with MH conditions presenting during the COVID-19 pandemic had higher adjusted odds of hospital admission (aOR = 1.4), and the adjusted length of hospital stay was 3.4 days longer during the pandemic.

Krass et al. (Apr 30, 2021). *US Pediatric Emergency Department Visits for Mental Health Conditions During the COVID-19 Pandemic*. *JAMA Network Open*. <https://doi.org/10.1001/jamanetworkopen.2021.8533>

Modeling and Prediction

- Averting one SARS-CoV-2 infection among a representative US resident would generate an additional 0.061 quality-adjusted life-years (QALYs) (0.055 for the patient; 0.006 for the patient's family members) according to a probabilistic simulation model informed by CDC COVID-19 estimates. Preventing one infection would result in a total of 1.51 total QALYs gained over a longer time horizon of 15 months if the ongoing transmission from the index patient is included,

though the analysis assumes that an effective vaccine is not available until three months into the simulation.

Basu and Gandhay. (May 2021). Quality-Adjusted Life-Year Losses Averted With Every COVID-19 Infection Prevented in the United States. Value in Health.

<https://doi.org/10.1016/j.jval.2020.11.013>

Other Resources and Commentaries

- [Interleukin-6 Receptor Blockade in Patients with COVID-19: Placing Clinical Trials into Context](#) – The Lancet Respiratory Medicine (Apr)
- [The Heterogeneity of the COVID-19 Pandemic and National Responses: An Explanatory Mixed-Methods Study](#) – BMC Public Health (May)
- [Prospects for Durable Immune Control of SARS-CoV-2 and Prevention of Reinfection](#) – Nature Reviews. Immunology (Apr)
- [Social Workers and the National Strategy for the COVID-19 Response and Pandemic Preparedness](#) – Health & Social Work (Apr 30)
- [Will SARS-CoV-2 Variants of Concern Affect the Promise of Vaccines](#) – Nature Reviews. Immunology (Apr)
- [‘Unprecedented Achievement’: Who Received the First Billion COVID Vaccinations](#) – Nature (Apr 29)
- [Sputnik V Vaccine Goes Global](#) – New Scientist (Apr)
- [A Review on the Immune Responses against Novel Emerging Coronavirus \(SARS-CoV-2\)](#) – Immunologic Research (Apr 29)
- [Covid-19: Most People Admitted to Hospital after Vaccination Were Infected before Immunity Could Develop, Research Shows](#) – BMJ (Apr 30)
- [Coronapod: The Inequality at the Heart of the Pandemic](#) – Nature (Apr 30)
- [Can Cuba Beat COVID with Its Homegrown Vaccines](#) – Nature (Apr 29)
- [A Data-Driven Simulation of the Exposure Notification Cascade for Digital Contact Tracing of SARS-CoV-2 in Zurich, Switzerland](#) – JAMA Network Open (Apr 30)
- [SARS-CoV-2 Elimination, Not Mitigation, Creates Best Outcomes for Health, the Economy, and Civil Liberties](#) – The Lancet (Apr)
- [Vaccination against SARS-CoV-2 Should Be Included in Childhood Vaccination Programs](#) – International Journal of Infectious Diseases (Apr)
- [Estimating the Cumulative Incidence of SARS-CoV-2 Infection and the Infection Fatality Ratio in Light of Waning Antibodies](#) – Epidemiology (Apr 2)
- [Cost-Effectiveness of COVID-19 Vaccination in Low- and Middle-Income Countries](#) – MedRxiv (May 2)
- [N440K Variant of SARS-CoV-2 Has Higher Infectious Fitness](#) – BioRxiv (Apr 30)
- [Why Is India Having a Covid-19 Surge](#) – BMJ (Apr 30)
- [U.S. Regional Differences in Physical Distancing Evaluating Racial and Socioeconomic Divides During the COVID-19 Pandemic](#) – MedRxiv (Apr 30)
- [Public Health Crises Compounded: A High School Equivalency Context in the Time of a Pandemic](#) – International Review of Education (Apr 27)

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