2019-nCoV Literature Situation Report (Lit Rep)
May 10, 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

- **Among Italian patients (n=286) who recovered from mild-to-moderate symptomatic COVID-19, the prevalence of altered sense of smell or taste one year after initial symptom onset was more than 20%.** More
- **Pooled estimates of vaccine-induced immune thrombotic thrombocytopenia (VITT) cumulative incidence among individuals who received the Oxford-AstraZeneca/Covishield vaccine was 1 in 139,000 in an analysis published as a pre-print. For those aged 65 and over, the risk was about 1 in 1,000,000, while for those under 55, the risk was between 1 in 20,000 to 60,000.** More

Transmission

- Additional follow-up data from a prior prospective cohort study of young adults (18-20 years) reinfected with SARS-CoV-2 after testing negative on three nasal swab PCR tests over a 2-week quarantine period found that viable virus was detected in 4 of 16 participants, and only once in each, with titers ranging from 1.7 to 5.5 $\log_{10}$ plaque-forming units per mL. All participants had detectable SARS-CoV-2 spike IgG at study enrollment, while none of the four who shed viable virus and only four of 12 who did not shed viable virus had detectable serum neutralization activity. Only one of the four who shed viable virus was symptomatic when viable virus was detected.
  Letizia et al. (May 2021). Viable Virus Shedding during SARS-CoV-2 Reinfection. The Lancet Respiratory Medicine. https://doi.org/10.1016/S2213-2600(21)00219-8

Geographic Spread

- *[Pre-print, not peer-reviewed]* There is evidence from sequencing data from GISAID that the SARS-CoV-2 B.1.620 variant, which shares mutations and deletions common to variants of concern (VOCs), including E484K, S477N, HV69Δ, Y144Δ, and LLA241/243Δ, is likely contributing to ongoing transmission locally in Lithuania, France, Germany, Spain, Belgium and the Central African Republic. The authors found evidence suggesting that some cases identified in Europe appeared to be linked with travel to Cameroon.
  Dudas et al. (May 8, 2021). Travel-Driven Emergence and Spread of SARS-CoV-2 Lineage B.1.620 with Multiple VOC-like Mutations and Deletions in Europe. Pre-print downloaded May 10 from https://doi.org/10.1101/2021.05.04.21256637

Testing and Treatment

- *[Pre-print, not peer-reviewed]* A genomic surveillance algorithm developed to combine RT-PCR and sequencing technologies to identify SARS-CoV-2 variants of concern found the frequency of S Gene Target Failure (SGTF) exponentially to 47% and 48% by the last week of March 2021, in both Puerto Rico and US laboratories, respectively. SGTF is used as a proxy for the SARS-CoV-2 B.1.1.7 variant. This increase in SGTF prevalence was concurrent with an increase in variants of concern among all SARS-CoV-2 sequences from Puerto Rico uploaded to GISAID (n = 461). The frequency of the B.1.1.7 variant increased from <1% in the last week of January 2021 to 51.5% of viral sequences from Puerto Rico collected in the last week of March 2021.
  Guerrero-Preston et al. (May 7, 2021). Precision Health Diagnostic and Surveillance Network Uses S Gene Target Failure (SGTF) Combined with Sequencing Technologies to Identify Emerging SARS-CoV-2 Variants. Pre-print downloaded May 10 from https://doi.org/10.1101/2021.05.04.21256012

- A systematic review and meta-analysis found that patients with COVID-19 who received convalescent plasma in randomized clinical trials (n=10 studies) and matched control studies (n=20 studies) had lower mortality rates compared with patients receiving standard treatments (OR = 0.58). In addition, exploratory analysis found that early treatment (within 3 days of hospital admission) of higher titer plasma was associated with lower mortality compared to later treatment (OR = 0.44 vs. OR = 0.79). The authors determined that the number of patients who would need to be treated to avoid one death was 11. The study included results published between January 1, 2020 and January 16, 2021 from randomized trials, matched control trials, dose-response studies, and case series or case reports published on preprint servers.
  Klassen et al. (May 2021). The Effect of Convalescent Plasma Therapy on Mortality Among Patients With COVID-19: Systematic Review and Meta-Analysis. Mayo Clinic Proceedings. https://doi.org/10.1016/j.mayocp.2021.02.008

- A study comparing the performance of three commercial immunoassays to detect SARS-CoV-2 IgA and IgG antibodies (Euroimmun SARS-COV-2 IgA/IgG, Mikrogen *recom*Well SARS-CoV-2 IgA/IgG, and SERION ELISA *agile* SARS-CoV-2 IgA/IgG) and three rapid lateral flow tests (Abbott Panbio COVID-19 IgG/IgM, NADAL COVID-19 IgG/IgM, and Cleartest Corona 2019-nCOV IgG/IgM) to a gold standard plaque-reduction neutralization test (PRNT50) found that the sensitivity of the three immunoassays ranged from 32% to 91%, and the specificity from 86% to 100%. The lowest sensitivity among the immunoassays was a test for IgA. The lateral flow assays had a broader range of sensitivity (7-89%) and similar specificity (91-100%). Only the SERION IgG showed a sensitivity and specificity of >98%. The analysis was based on samples from 63 patients who recovered from COVID-19 up to seven months after symptom onset, and 50 samples from before the beginning of the pandemic.
  Krone et al. (May 7, 2021). Performance of Three SARS-CoV-2 Immunoassays, Three Rapid Lateral Flow Tests and a Novel Bead-Based Affinity Surrogate Test for the Detection of SARS-CoV-2 Antibodies in Human Serum. Journal of Clinical Microbiology. https://doi.org/10.1128/JCM.00319-21

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Vaccines and Immunity

- Among healthcare workers in Spain who recovered from COVID-19 (n = 22), T-cell response was significantly lower among those with early loss of antibodies (6 cases, 27%) a median of 1.8 months after diagnosis. After 5.1 months, 77% of participants had antibody decline (41% seroreverted; $p<0.01$), and 36% lost T-cell response (75% lost response to spike protein). *Casado et al. (May 7, 2021). Progressive and Parallel Decline of Humoral and T Cell Immunity in Convalescent Health Care Workers with Asymptomatic or Mild-Moderate SARS-CoV-2 Infection. The Journal of Infectious Diseases.* https://doi.org/10.1093/infdis/jiab242

- *[Pre-print, not peer-reviewed]* Pooled estimates of vaccine-induced immune thrombotic thrombocytopenia (VITT) cumulative incidence among individuals who received Oxford-AstraZeneca/Covishield vaccine in 10 countries found an overall risk of 1 in 139,000. For those aged 65 and over, the risk was about 1 in 1,000,000, while for those under 55, the risk was between 1 in 20,000 to 60,000. Risk also varied between countries in the analysis, with a cumulative incidence of 1.67 per 100,000 in the UK, and 5.06 per 100,000 in Norway. The authors note that even the highest reported incidence in Norway is lower than the risk of serious COVID-19 outcomes in areas with high community spread, as well as risk of serious injury requiring hospitalization or death as a result of driving. *Chan et al. (May 8, 2021). Meta-Analysis of Risk of Vaccine-Induced Immune Thrombotic Thrombocytopenia Following ChAdOx1-S Recombinant Vaccine. Pre-print downloaded May 10 from* https://doi.org/10.1101/2021.05.04.21256613

- *[Pre-print, not peer-reviewed]* A prospective study of adults (n = 160) in Israel who had not been previously infected with SARS-CoV-2 evaluated physiological changes in participants before and after their second Pfizer-BioNTech dose. Participants were given a chest-patch sensor to wear for four days, starting one day before vaccination. The sensor measured 13 physiological parameters including heart rate, blood oxygen saturation, respiratory rate, blood pressure, cardiac output, and body temperature, and the accompanying mobile application collected daily self-reported questionnaires regarding local and systemic reactions, sleep quality, stress levels, physical activity, and mood levels. Within the first 48 hours post-vaccination, there were significant changes in nearly all 13 chest-patch indicators compared to baseline, including among 78 participants (half of the cohort) who reported no local or systemic reactions. These measures returned to baseline levels within three days after vaccination. *Gepner et al. (May 7, 2021). Short-Term Effects of BNT162b2 MRNA COVID-19 Vaccination on Physiological Measures a Prospective Study. Pre-print downloaded May 10 from* https://doi.org/10.1101/2021.05.06.21256587

- *[Pre-print, not peer-reviewed]* Among 63 COVID-19 convalescent individuals assessed at 1.3, 6.2 and 12 months after infection, antibody reactivity to the receptor binding domain (RBD), neutralizing activity, and the number of RBD-specific memory B cells remained relatively stable from 6 to 12 months in those who had not been vaccinated. Among the 41% of the cohort who received an mRNA vaccine, all components of the humoral response were increased, and serum neutralizing activity against variants of concern was comparable to or greater than the original strain achieved by vaccination of individuals not previously infected. The authors argue that immunity among convalescent individuals may be long lasting, and that those who receive mRNA vaccines will produce antibodies and memory B cells that may be protective against circulating SARS-CoV-2 variants.

Wang et al. (May 9, 2021). Vaccination Boosts Naturally Enhanced Neutralizing Breadth to SARS-CoV-2 One Year after Infection. Pre-print downloaded May 10 from https://doi.org/10.1101/2021.05.07.443175

Clinical Characteristics and Health Care Setting

- More than 20% of patients surveyed in Italy who recovered from mild-to-moderate symptomatic COVID-19 reported altered sense of smell or taste one year after initial symptom onset (prevalence = 57/286, 21%). 34 participants reported both smell and taste dysfunction, while 15 reported smell impairment alone and 5 taste disorder alone after 1 year. Of 187 patients who reported COVID-19 associated smell and/or taste dysfunction at study baseline, 130 (70%) reported complete resolution of smell or taste impairment, 41 (22%) reported impairment with a decrease in the severity, and 16 (9%) reported persistence in symptom severity or worsening 1 year after onset.

  Boscolo-Rizzo et al. (May 2021). Self-Reported Smell and Taste Recovery in Coronavirus Disease 2019 Patients: A One-Year Prospective Study. European Archives of Oto-Rhino-Laryngology. https://doi.org/10.1007/s00405-021-06839-w

- A study using RNA sequencing found evidence to suggest that SARS-CoV-2 RNA may be able to integrate into human cell genomes in vitro, perhaps explaining the persistence of viral RNA among patients even after recovery from COVID-19. The authors found evidence that suggests viral–host chimeric transcripts are created via long interspersed nuclear elements, which reverse-transcribe RNA into DNA.

  Zhang et al. (May 25, 2021). Reverse-Transcribed SARS-CoV-2 RNA Can Integrate into the Genome of Cultured Human Cells and Can Be Expressed in Patient-Derived Tissues. Proceedings of the National Academy of Sciences. https://doi.org/10.1073/pnas.2105968118

Modeling and Prediction

- *[Working paper, not peer-reviewed]* A modeling study from the National Bureau of Economic Research found that school reopenings in Texas in the fall of 2020 may have accelerated community spread of COVID-19, with 43,000 additional cases and more than 800 additional deaths within the first two months following reopenings. The report notes that schools in Texas reopened when community transmission was high, and reopenings occurred at near full student capacity, making social distancing difficult. Using mobility data, the authors found that the median time spent outside the home on a typical weekday increased substantially in neighborhoods with large numbers of school-age children, suggesting that reopenings may have impacted the behavior of adults.

  Courtemanche et al. (May 2021). School Reopenings, Mobility, and COVID-19 Spread: Evidence from Texas. https://www.nber.org/papers/w28753

Public Health Policy and Practice

- Perceptions of risk of suffering from economic loss due to the pandemic were associated with COVID-19 mitigation behavior and support for strict containment measures, while perceptions of health risks had variable effects on behaviors and support, in a cross-sectional study with data collected in 24 countries (N = 25,435). Survey results suggest that globally, respondents tended to perceive greater personal economic risk than health risk, but that individuals did not perceive saving the economy and saving lives as competing endpoints.

Nisa et al. (May 2021). Lives versus Livelihoods? Perceived Economic Risk Has a Stronger Association with Support for COVID-19 Preventive Measures than Perceived Health Risk. Scientific Reports. https://doi.org/10.1038/s41598-021-88314-4

- Most participants (59%) in a survey of Medicare beneficiaries over age 65 (n = 8,050) administered between June and July 2020 reported relying on traditional news sources (TV, radio, websites, newspapers) for COVID-19 information; other less commonly reported sources included healthcare providers (11%), government officials (11%), webpages/internet (9%), friends/family members (9%), and social media (1%). Participants who relied on government officials for COVID-19 information (vs. traditional news sources) were more likely to engage in preventive behaviors (OR = 1.7), while those who relied on information from friends/family were less likely to engage in preventive behaviors (OR = 0.6).
Ng and Park. (May 2021). The Role of Media Sources for COVID-19 Information on Engaging in Recommended Preventive Behaviors among Medicare Beneficiaries Aged ≥ 65 Years. The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences. https://doi.org/10.1093/geronb/gbab083

Other Resources and Commentaries

- Coronapod: Waiving Vaccine Patents and Coronavirus Genome Data Disputes – Nature (May)
- Allergy to COVID-19 Vaccines: A Current Update – Allergology International (Apr)
- Precision Medicine for COVID-19: Phenotype Anarchy or Promise Realized – JAMA (May)
- Rapid Antigen Testing in COVID-19 Responses – Science (May 7)
- COVID-19 in the WHO African Region: Using Risk Assessment to Inform Decisions on Public Health and Social Measures – Epidemiology and Infection (May)
- India's COVID-19 Emergency – Lancet (May)
- International COVID-19 Trial to Restart with Focus on Immune Responses – Nature (May)
- COVID-19 Vaccine Impact in Israel and a Way out of the Pandemic – Lancet (May)
- Thrombotic Thrombocytopenia Due to SARS-CoV-2 Vaccination – Cleveland Clinic Journal of Medicine (May)
- Visual Exploratory Analysis of COVID-19 Pandemic One Year After the Outbreak – MedRxiv (May 8)
- A Blueprint to Control the SARS-CoV-2 Pandemic – Mayo Clinic Proceedings (May)
- Covid-19: Africa Scrambles to Increase Genomic Testing Capacity as Variants Spread – BMJ (May)
- Systematic Review of Experiences and Perceptions of Key Actors and Organisations at Multiple Levels within Health Systems Internationally in Responding to COVID-19 – Implementation Science (Dec 7)
- Covid-19: Sputnik Vaccine Rockets, Thanks to Lancet Boost – BMJ (May 6)

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