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

- A phase 1, dose-escalation, open-label trial of the candidate vaccine mRNA-1273 among 45 healthy adults found that all participants had serum neutralizing antibody activity after the second vaccination. No trial-limiting safety concerns were identified. More

- Self-reported contact surveys and wearable proximity sensors were highly correlated methods for capturing person-to-person contact patterns relevant to respiratory virus transmission among 730 schoolchildren in the Pittsburgh metropolitan area. More

- Updated COVID-19 forecasts from the Institute for Health Metrics and Evaluation estimated that the cumulative mortality in the US could reach 430,494 by the end of 2020. Their model indicates that universal mask use may prevent nearly 25% of the estimated deaths. More

- A neonate born to a mother infected in the third trimester was confirmed to have transplacental transmission of SARS-CoV-2. More

Non-Pharmaceutical Interventions

- [Preprint, not peer-reviewed] Grantz et al. compared data from self-reported contact surveys and wearable proximity sensors from 730 schoolchildren in the Pittsburgh metropolitan area. The two methods produced highly correlated data on age-specific mixing patterns relevant to the dynamics of respiratory virus transmission. The results from the methods differed in that participants reported fewer but longer contacts in surveys relative to the generally short proximal interactions captured by wearable sensors.
  

Transmission

- Vivanti et al. demonstrated a transplacental transmission of SARS-CoV-2 in a neonate born to a mother infected in the third trimester and delivered at the Paris Saclay University Hospitals. RT-PCR testing for SARS-CoV-2 was positive from multiple sites from the neonate, including blood, bronchoalveolar lavage fluid, nasopharyngeal and rectal swabs, and placental samples. The neonate presented with neurological manifestations, similar to those described in adult patients.

Testing and Treatment

- Detection of SARS-CoV-2 RNA was reported in 21 samples from aircraft and cruise ship wastewater sanitation systems (adsorption-extraction by electronegative membrane [n=13] and ultrafiltration by Amicon [n=8]). Concentrations were near the limit of detection for the assay. Findings suggested the surveillance of wastewater from large transport vessels with their own sanitation systems could be a complementary data source to prioritize clinical testing and contact tracing among disembarking passengers.


- An ecological study conducted by Klinger et al. find a strong negative correlation between the years of BCG administration and the deaths per million from COVID-19 based on data from 55 countries. Countries with BCG immunization policies over the past 15 years have a significantly lower rate of COVID-19 deaths than countries with no BCG in last 15 years (p=0.0004). [EDITORIAL NOTE: Results from ecological studies should be interpreted with caution due to unmeasured confounding between countries and may not reflect individual-level effects]


- [Preprint, not peer-reviewed] A systematic review (32 studies with 1,023 SARS-CoV-2 infected patients) showed the highest percentage of detection of SARS-CoV-2 by RT-PCR was from nasopharyngeal sampling between 0 to 4 days post-symptom onset at 89% (95%CI 83%-93%). The percentage dropped to 54% (95%CI 47%-61%) after 10 to 14 days. Up to 30% of participants with SARS-CoV-2 detected in respiratory samples did not have detectable fecal samples.


- Based on a sample of 172 suspected cases of SARS-CoV-2 and 795 negative plasma samples, IgG antibody testing had a 100% specificity (0/795) and IgG tests were positive for 83% of suspected cases among samples collected more than 14 days from symptom onset.
- There was no association between the level of IgG and IgM reactivity and mild versus severe disease course.


Vaccines

- The candidate vaccine mRNA-1273 was shown to induce antibody and T-cell immune responses in all participants (n=45).
- Jackson et al. conducted a phase 1, dose-escalation, open-label trial including 45 healthy adults, to test the candidate vaccine mRNA-1273 encoding the stabilized prefusion of SARS-CoV-2 spike protein. Participants received two vaccinations, 28 days apart in three dose groups.
• After the first vaccination, antibody responses were higher among those who received the higher dose. After the second vaccination, the titers increased and all participants had serumneutralizing activity. No trial-limiting safety concerns were identified.
  

Clinical Characteristics and Health Care Setting

• A multicenter study in the US compared 37 inpatients with cirrhosis and COVID-19 to age- and gender-matched patients with COVID-19 alone (n=108) or cirrhosis alone (n=127). Results showed that patients with cirrhosis and COVID-19 had a non-significantly higher mortality compared to patients with cirrhosis alone (30% vs 20%, p=0.16), and significantly higher mortality than patients with COVID-19 alone (30% vs 13%, p=0.03). The elevated mortality among those with cirrhosis and COVID-19 may be at least partially attributable to a higher degree of co-morbidities, as measured by the Charlson Comorbidity Index.
  

• Among 9,850 health care workers Massachusetts between March 1 and April 30, 2020 13% were positive for SARS-CoV-2 by RT-PCR. Prior to implementation of universal masking (March 1-24, 2020), the SARS-CoV-2 positivity rate increased exponentially from 0% to 21%, with a case doubling time of 3.6 days (95%CI 3.0-4.5 days). After implementation of universal masking (April 11-30, 2020), the positivity rate decreased linearly from 14.7% to 11.5%, with a weighted mean decline of 0.49% per day.
  

Mental Health and Personal Impact

• In a nationally representative sample of 1,041 adults from the general population of the Republic of Ireland, the rate of COVID-19-related posttraumatic stress disorder (PTSD) was 18%. Of individuals who screened positive for PTSD, 54% met the criteria for depression, 50% for generalized anxiety disorder, and 60% for either depression or anxiety. COVID-19-related PTSD was associated with younger age, male sex, living in a city, living with children, and moderate and high perceived risk of COVID-19 infection.
  

Modeling and Prediction

• [Preprint, not peer-reviewed] The Institute for Health Metrics and Evaluation (IHME) team used an SEIR model to estimate trajectories of SARS-CoV-2 infections and the impact of non-pharmaceutical interventions at the state level from July 5 to December 31 2020. The model projects that cumulative total deaths across the US could reach 430,494 (288,046–649,582) by December 31st, 2020. Greater than 60% of the deaths projected in this scenario would occur in five states:
California, Florida, Texas, Massachusetts, and Virginia. The model indicates that an emphasis on universal mask use may reduce epidemic resurgences in many states, saving as many as 102,795 (95%CI 55,898 to 183,374) lives.


- [Preprint, not peer-reviewed] Andrasfay and Goldman used COVID-19 projections produced by the Institute for Health Metrics and Evaluation and estimated a reduction in life expectancy at birth due to COVID-19 of greater than 1.5 years for Black and Latino populations, which is one year larger than the reduction for whites. This would be a 30% increase (from 3.6 to 4.7 years) in the Black-white gap in life expectancy. The survival advantage among Latinos would decline by 36%, equivalent to its magnitude in 2006.


Public Health Policy and Practice
- [Preprint, not peer-reviewed] During March 1-April 30, 907 cases of SARS-CoV-2 infection were detected among detained persons (n = 628) and staff (n = 279) in the Cook County Jail (Chicago) and there were 9 deaths. Programmatic activity and visitation stopped on March 9, and cells were converted into single occupancy beginning March 26. Universal masking was implemented for staff (April 2) and detained persons (April 13). Cases at the jail declined while cases in Chicago increased.


Other Resources and Commentaries
- Researchers Home in on COVID-19 Severity Biomarkers – JAMA (July 14)
- COVID-19 Antibody Trials Have Begun – JAMA (July 14)
- Tackling the Cytokine Storm in COVID-19, Challenges, and Hopes – Life Sciences (July 11)
- Hypothetical Targets and Plausible Drugs of Coronavirus Infection Caused by SARS-CoV-2 – Transboundary and Emerging Diseases (July 13)
- The Spectrum of Pathological Findings in Coronavirus Disease (COVID-19) and the Pathogenesis of SARS-CoV-2 – Diagnostic Pathology (July 14)
- Universal Masking to Prevent SARS-CoV-2 Transmission—The Time Is Now – JAMA (July 14)
- Identification of Vulnerable Populations and Areas at Higher Risk of COVID-19 Related Mortality in the U.S. – Preprint (July 14)
- Unnecessary Hesitancy on Human Vaccine Tests – Science (July 10)
- Aligning Public Health Infrastructure and Medicaid to Fight COVID-19 – American Journal of Public Health (July 14)
- The Molecular Virology of Coronaviruses – The Journal of Biological Chemistry (July 13)
- COVID-19 Contact Tracing Solutions for Mass Gatherings – Disaster Medicine and Public Health Preparedness (July 14)
- Covid-19: Disinfectants and Sanitisers Are Changing Microbiomes – BMJ (July 14)
• **Subsequent Waves of Viral Pandemics a Hint for the Future Course of the SARS-CoV-2 Pandemic** – Preprint (July 14)
• **State-Level Tracking of COVID-19 in the United States** – Preprint (July 14)
• **The Invisible Epidemic: Neglected Chronic Disease Management During COVID-19** – Journal of General Internal Medicine (July 14)

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