COVID-19 Evidence Digest 11/24/20

[Antibodies to SARS-CoV-2 Are Associated with Protection against Reinfection](#) (medRxiv pre-print)

Bottom Line: This pre-print study among healthcare workers found that prior SARS-CoV-2 infection that resulted in antibody responses was protective against subsequent infection for most participants during the 6-month follow-up period.

Details: This study examined the proportion of new SARS-CoV-2 infections by antibody status in a large sample of seropositive (prior exposure) and seronegative (no prior exposure) healthcare workers (HCW).12,219 HCW participated in the study. To identify HCW with previous SARS-CoV-2 infections at baseline, antibody levels were ascertained using SARS-CoV-2 spike and nucleocapsid immunoglobulin G (IgG) antibody tests. Of 12,219 participants, 11,052 did not have antibodies at baseline; 1,167 did, and an additional 79 seroconverted during follow-up, for a total of 1,246 with positive antibody tests. Follow-up took place over 30 weeks (from April to November), during which HCW underwent routine and symptomatic SARS-CoV-2 testing. Of the 11,052 HCW who did not have SARS-CoV-2 antibodies at baseline, 89 had polymerase chain reaction (PCR)-confirmed symptomatic SARS-CoV-2 infection during follow-up. There were no symptomatic infections in individuals with baseline antibodies against the virus' spike protein. 76 additional HCW with no antibodies against the spike protein at baseline had PCR-positive tests during routine (asymptomatic) screening, compared to 3 HCW with antibodies at baseline, who did not develop symptoms. Positive antibodies against the spike protein at baseline were associated with lower rates of PCR-confirmed positivity (adjusted rate ratio 0.24, 95%CI 0.08-0.76, with similar rate ratios for IgG antibodies against the nucleocapsid alone or in combination with anti-spike IgG).

Key Takeaways:
- Findings from this study, which have not been peer-reviewed and thus should be interpreted with caution, suggest that SARS-CoV-2 re-infection is highly unlikely for at least 6 months after the initial infection.
- More research is needed to ascertain protection against SARS-CoV-2 infection beyond 6 months.

[SARS-CoV-2, SARS-CoV, and MERS-CoV Viral Load Dynamics, Duration of Viral Shedding, and Infectiousness: A Systematic Review and Meta-Analysis](#) (Lancet Microbe)

Bottom Line: This systematic review and analysis across studies (meta-analysis) of viral load dynamics, viral shedding duration, and infectiousness found SARS-CoV-2 viral loads in the upper respiratory tract are highest in the first week after infection. Additionally, while SARS-CoV-2 RNA shedding can persist in stool, blood, and the respiratory tract, viable virus cannot be detected beyond 9 days post-infection.

Details: This systematic review and meta-analysis compared viral dynamics, viral shedding duration, and infectiousness of SARS-CoV-2, SARS-CoV, and MERS-CoV. Pre-print and peer-reviewed databases and grey literature published from 1/1/03 –

6/6/20 were searched; various study designs were included for consideration. Average length of viral shedding was calculated for every applicable study, and the random-effects model was applied to estimate a pooled effect size. 98 studies were included (79 on SARS-CoV-2, 8 on SARS-CoV, and 11 on MERS-CoV). The average length of SARS-CoV-2 RNA shedding in the upper respiratory tract, lower respiratory tract, stool, and serum was 17, 14.6, 17.2, and 16.6 days, respectively; maximum shedding duration was 83, 59, 35, and 60 days, respectively. Pooled average shedding duration was positively associated with age. Though high viral loads frequently persisted in included studies, live SARS-CoV-2 was not detected in any sample beyond 9 days post-symptom onset. While upper respiratory tract viral load was highest at 10-14 days and 7-10 days for SARS-CoV and MERS-CoV, respectively, viral load of SARS-CoV-2 peaked during the first week of symptom onset. Lastly, several studies reported similar viral loads among asymptomatic and symptomatic patients with SARS-CoV-2 at the start of infection, but time to clear the virus was generally shorter in asymptomatic patients, suggesting similar transmission potential at infection onset but a shorter period of infectiousness.

Key Takeaways:

- Findings underscore the importance of 1) early SARS-CoV-2 case detection and isolation and 2) public education about the spectrum of COVID-19 illness and the timing and duration of the virus' infectiousness period for SARS-CoV-2 containment.

[Trends in County-Level COVID-19 Incidence in Counties With and Without a Mask Mandate — Kansas, June 1–August 23, 2020](#) (MMWR)

Bottom Line: In Kansas, 24 counties that required mask wearing in public spaces saw a decrease in new COVID-19 cases, while cases in 81 counties without mask mandates continued to increase.

Details: This study examines COVID-19 trends in Kansas counties before (6/1-7/2) and after (7/3-8/23) the governor's executive order mandating the use of masks or face coverings in public spaces (issued on 7/2). As part of that order, counties could choose to opt out of the state mandate or adopt their own mask mandate. As of 8/11, 24 counties (23% of all counties) had not opted out, or had adopted their own mask mandate around the same time as the executive order, and 81 counties (77%) opted out and did not adopt their own mask mandate. Trend analyses comparing 7-day rolling averages of new daily COVID-19 cases from 6/1 to 7/2 indicate that both counties that would ultimately implement mask mandates and those that would not were increasing each day, with greater increases in the former. After 7/3, the 7-day rolling average of new daily COVID-19 cases decreased (average decrease of 0.08 cases per 100,000 per day; 6% net decrease) in the 24 counties with a mask mandate and continued to increase (average increase of 0.11 cases per 100,000 per day; 100% net increase) in the 81 counties without a mask mandate. A strength of this study was the comparison of counties to themselves over time, which controlled for county-level characteristics that might otherwise make comparison difficult.

Key Takeaways:

- Prior to the governor's executive order, COVID-19 rates were higher in Kansas counties that ultimately adopted a mask mandate than in those that did not; this analysis demonstrated that rates declined significantly in counties with mask mandates, and continued to increase in counties without mask mandates.
- Findings suggest that countywide mask mandates contributed to the mitigation of SARS-CoV-2 spread in Kansas counties that had them in place.