AAMC Novel Coronavirus Update

January 13, 2021

To help filter through the large volume of news about the novel coronavirus, Ross McKinney Jr., MD, AAMC chief scientific officer, with assistance from his team in the Scientific Affairs unit at the AAMC, has initiated this science-focused newsletter.

This newsletter will be published once per week on Wednesdays.

Opt-in to receive future updates.

Contact AAMC Lead Science Policy Specialist Anu Dev, PhD, with any other questions or requests.

To access the latest AAMC updates and resources on COVID-19, visit aamc.org/coronavirus. For resources on COVID-19 medical research, read more here.

Please share/forward this newsletter freely.

Note: The AAMC Coronavirus Update will take a break next week and return on Wednesday, Jan. 27.

Today's Numbers

- World: 91,771,125 confirmed cases (1,968,343 deaths)
  - 4,607,815 new cases this week (4,455,547 last week)
- United States: 22,860,032 confirmed cases (381,130 deaths)
  - 1,742,426 new cases this week (1,535,930 last week)
  - 23,236 deaths this week (18,696 last week)
  - 269,334,131 total tests
- U.S. Hot Spots
  - California: 294,954 new cases in last 7 days (11% increase in daily cases)
  - Texas: 152,139 (20%)
  - New York: 114,342 (18%)
  - Florida: 111,359 (16%)
  - Georgia: 67,538 (12%)
- U.S. COVID-19 Vaccine Distribution and Administration
  - Total Doses Distributed: 27,696,150
  - Total Number of People Initiating Vaccination: 9,327,138

For the most up-to-date data, refer to the Johns Hopkins COVID-19 Map. Details of other U.S. hot spots can be found at the Washington Post's coronavirus data webpage. Overall U.S. COVID-19 vaccine distribution and administration data can be found at the Centers for Disease Control and Prevention (CDC) COVID Data Tracker.

The Institute for Health Metrics and Evaluation at the University of Washington Medicine is
proj ecting hospital resource use in the United States based on COVID-19 deaths.

Lead News

A not yet peer-reviewed study published in bioRxiv examined neutralization of the N501Y mutant strain of SARS-CoV-2. N501Y is present in the recently identified U.K. and South Africa virus strains that are believed to be more transmissible. The study evaluated the effects of mRNA-based COVID-19 vaccine BNT162b2-elicited sera (aka the Pfizer/BioNTech vaccine) on the mutant strains and found that sera of 20 participants in a previously reported trial of the BNT162b2 vaccine had equivalent neutralizing titers for the wild-type N501 and mutant Y501 viruses. As new variants of SARS-CoV-2 are identified, researchers continue to study the effectiveness of current vaccines to determine whether a mutation might necessitate changing the mRNA sequence in order to adapt to strain change.

Treatment News

In a finding that is consistent with monoclonal antibody studies, the use of convalescent plasma to treat patients early in their SARS-CoV-2 infection can decrease the rate of severe disease. In a study from Argentina published in the New England Journal of Medicine (NEJM), 160 adults age 75 or older who were within 72 hours of the onset of mild COVID-19 symptoms were randomized to high-titer plasma or placebo control. Thirteen of 80 (16%) patients randomized to convalescent plasma progressed to severe respiratory disease compared to 25 of 80 (31%) placebo-treated patients. The relative risk reduction was 48%. [Editor’s comment: Just like with monoclonal antibodies, polyclonal antibodies administered early in the course of the disease can lower viral load and diminish disease progression. The key: early testing with good turnaround on test results.]

Clinical News

The CDC conducted an observational, case control study of new COVID-19 cases by county, looking at 101 counties with large nonprofit universities (greater than or equal to 20,000 students) and comparing counties whose schools had remote instruction to those that had in-person classes. The first time period was the 21 days before the start of classes in August 2020, and the comparison period was the 21 days after the start of classes. In those counties that did not have a university, COVID-19 incidence declined by 5.9%. In the 22 counties with universities that had remote classes, the decline was 17.9%. In contrast, for the 79 counties with universities with in-person classes, the increase in COVID-19 incidence in the two periods was 56.2%.

The CDC was also opportunistic in working with colleges and their sports programs to assess the timing of when SARS-CoV-2-infected individuals register as positive via polymerase chain reaction (PCR) test after COVID-19 exposure. Because athletes are placed in quarantine after exposure for 14 days, the CDC had a captive audience. 40.7% of the exposures were at social events, 31.7% were roommates, and only 12.7% of exposures were directly sports-related. Of the 1,380 quarantined athletes, 25% became PCR-positive. The average time to PCR positivity was 3.8 days after exposure. The probability of positivity was 27% after day five and less than 5% by day 10. Essentially, this affirms the CDC’s recent recommendation of a 10-day quarantine after exposure.

A group of investigators at the Duke University School of Medicine and the University of
North Carolina worked with school systems across North Carolina to evaluate rates of in-school transmission of SARS-CoV-2, and they published their results in the journal *Pediatrics*. The study included nearly 100,000 students at 11 school districts that relied on in-class instruction (out of 56 participating school districts). Students were monitored from Aug. 15 to Oct. 23, 2020. Schools followed a program referred to as the “Twelve Principles,” with hand-washing, mask-wearing, physical distancing, and other interventions. During this period, the community incidence of COVID-19 in North Carolina was 1-2 cases per 1000 residents. Over the nine-week study period, there were 773 community-acquired cases as determined by PCR in students and staff, and through contact tracing and an adjudication process, it was determined that only 32 of the cases were acquired in the school setting. There were no child-to-staff within-school transmissions. There was one outbreak in a pre-K program participating in the project, but that program was not using masks at the time of the outbreak. There were two clusters in a special needs class setting, one of which was thought to be caused by proximate eating at lunch. At the conclusion, the authors noted that if the community rates had been present in the schools, there would have been 800-900 secondary cases in the schools instead of 32. [Editor’s comment: I had a chance to discuss this research with one of the authors (Daniel Benjamin, MD, PhD, who worked with me as a trainee) and he reinforced that masks seemed to work — and that children could be taught to wear masks more readily than adults. This article adds data for the discussion about balancing the developmental need of children to be with peers and the question of whether schools might act as an initiation site for the spread of COVID-19. The data appear to suggest that in-person schools can be run safely.]

Taking a very different approach than North Carolina, Sweden kept schools open and made no effort to encourage mask-wearing. The results of evaluating the approach were published in a correspondence in the *NEJM*. The investigators’ focus was on intensive care unit (ICU) admissions and severe COVID-19. From March to June 2020 (the period of study), 15 children were admitted to an ICU in Sweden, and no children died of COVID-19. Surveillance data showed that fewer than 30 teachers were admitted to an ICU during that time period. [Editor’s comment: Reports like this one from Sweden leave more questions than they provide answers. The one piece of good news: Children don’t appear to die of COVID-19 very frequently. However, “ICU admissions” is a fairly draconian endpoint for a study, and it isn’t clear whether schools might have been a focus for the spread of SARS-CoV-2 as they have been for influenza. It doesn’t appear likely, but this small study had more limited ambitions.]

To help address the issue of transmission in the school setting, investigators in Norway did full contact tracing of all pediatric cases that were identified in school settings in two counties. The results of their study were published in *Eurosurveillance*. The study was performed in Oslo and Viken Counties, the two highest-incidence counties for COVID-19 in Norway during the study period (September-November 2020). Full contact tracing was performed for each index case, which was defined as a child age 5-13 who had been in school within 48 hours of when their positive PCR was identified. There were 13 contact tracings in the study period and 292 evaluated contacts. All but one of the index cases had a history of an infected family member. The exposed contacts who consented were PCR tested twice — at the beginning and end of their 10-day quarantine period. Among the 234 child contacts, there were two primary cases and no secondary cases. Among the 58 adult contacts, there was one primary case. The bottom line was a less than 1% transmission rate to other children and a less than 2% rate from children to adult contacts. [Editor’s comment: The study is small but appears to be done well. It might have been better to wait a few days on the first PCR for contacts since the timing may have missed the period of viral shedding for some contacts. I agree with the author’s conclusion that school attendance should be manageable if good attention is paid to precautions like masks, hand-washing, and distancing.]
A study published in the *Lancet* by investigators in China evaluated the long-term outcome of patients hospitalized with COVID-19 between January and May 2020. They excluded patients who died before follow-up as well as those with certain conditions including psychiatric diseases, mobility limitations, and strokes. The evaluation six months after discharge included a history, physical exam, and blood tests. More severely ill patients had pulmonary function tests and chest CT scans. 1,733 out of 2,469 discharged patients were evaluated, with a median age of 57. Fatigue or muscle weakness was reported by 63%, while 26% reported sleep disturbances. 23% were depressed or anxious. In general, patients with a more severe in-hospital course had more severely impaired pulmonary diffusion capacities and chest CT findings. [Editor’s comment: The sad news is that almost two-thirds of patients still had muscle aches and fatigue six months after hospitalization. It is important to note these were hospitalized patients, so they were more acutely ill in their initial presentation. However, the high proportion of patients with long-term symptoms is all the more reason to hope vaccinations can be performed rapidly.]

**Policy News**

The Food and Drug Administration (FDA) issued a statement that there is not adequate data to justify proposals to halve the dose of current mRNA vaccines or delay administration of second doses. They affirmed both the dosage amounts and the interval of 21 days for the Pfizer/BioNTech vaccine and 28 days for the Moderna vaccine.

[HHS Launches Web-Based Locator for COVID-19 Outpatient Treatment Sites for Monoclonal Antibodies]

**Coronavirus and Health Equity**

New research published in the *Journal of Racial and Ethnic Health Disparities* explored the relationship between COVID-19 mortality and neighborhood-level social determinants of health (SDOH). Results showed that counties in the lowest quintile of a measure of economic privilege had increased COVID-19 death rates of 67.5%. Other health-harming SDOH — such as local incarceration rates, percent of households without internet, and percent of adults without a high school diploma — were also found to significantly increase COVID-19 death rates.

A new analysis from the Kaiser Family Foundation found that rural residents are among the most vaccine-hesitant groups: Only 3 in 10 (31%) people in rural areas report they will “definitely get” the vaccine compared with 4 in 10 people in urban areas (42%) and suburban areas (43%). These differences remained even after political affiliation was taken into account.

[New York Times: Dr. Marcella Nunez-Smith Takes Aim at Racial Gaps in Health Care]

[U.S. News and World Report: Black Patients at Higher Risk When Type 1 Diabetes and COVID Combine]

[Business Insider: Most COVID-19 Vaccines Are Going to White People. Even Though the Pandemic Has Ravaged Communities of Color]

**Research News**
To better understand the immunological memory to SARS-CoV-2, researchers assessed immune memory of all three branches of adaptive immunity (CD4+ T cell, CD8+ T cell, and humoral) using samples from 188 individuals with COVID-19 for up to eight months after infection. The findings indicate that Immunoglobulin G to the spike protein was relatively stable over six months or more, spike-specific memory B cells were more abundant at six months than at one month post-symptom onset, and SARS-CoV-2-specific CD4+ T cells and CD8+ T cells declined with a half-life of three to five months. Given these data, the authors suggest that durable immunity against secondary COVID-19 is a possibility in most individuals.

Testing News

The FDA issued an alert for laboratories and clinicians to be aware that mutations in circulating SARS-CoV-2 strains have the potential to cause false negative PCR tests. The B.1.1.7 strain circulating in the United Kingdom was uncovered in part because one of the three primers used in standard diagnostic tests there was adversely affected by the strain’s mutations. The FDA noted that three U.S.-approved diagnostic assays would be affected by the mutations in B.1.1.7, although the pattern of one negative primer and two positive primers might be useful in early identification of B.1.1.7’s presence.


Other COVID-19 News

CDC MMWR: Participation in Fraternity and Sorority Activities and the Spread of COVID-19 Among Residential University Communities — Arkansas, August 21–September 5, 2020


Emerging Infectious Diseases: Genomic Evidence of In-Flight Transmission of SARS-CoV-2 Despite Predeparture Testing

AAMCNews: As COVID-19 Vaccines Roll Out, Medical Students Help With Inoculations

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