AAMC Novel Coronavirus Update
November 18, 2020

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.

The coronavirus update will be on hiatus next week for the Thanksgiving holiday and will return on Wednesday, Dec. 2.

Today's Numbers

- World: 55,917,685 confirmed cases (1,342,080 deaths)
  - 4,142,963 new cases this week (3,942,157 new cases last week)
- United States: 11,400,796 (249,187)
  - 1,101,228 new cases this week (848,063 new cases last week)
  - 8,201 deaths this week (7,087 deaths last week)
  - 165,828,419 total tests
- U.S. Hot Spots
  - Illinois: 74,009 new cases in last 7 days (8% increase in daily cases)
  - Texas: 60,383 (12%)
  - California: 53,296 (36%)
  - Minnesota: 47,473 (41%)
  - Ohio: 45,087 (37%)

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.

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

Modern is the second company to report success with a SARS-CoV-2 vaccine. In preliminary results from the joint Moderna-National Institutes of Health (NIH) study, the mRNA-1273 vaccine was 94.5% effective in preventing symptomatic COVID-19. The study was placebo-controlled, and an interim analysis after 95 symptomatic cases found that 90 were in the placebo cohort, while only five were in the vaccinated arm. There were 11 severe cases of COVID-19 — all in the placebo arm. Side effects were reported to be mild to moderate, including sore arms after both doses and some fatigue and headache after the second dose. [Editor's comment: This is, of course, great news and fits with the results Pfizer-BioNTech reported last week. The Moderna-NIH vaccine is somewhat easier to store and distribute, particularly since Moderna announced that the vaccine is stable for 30 days in a refrigerator and 12 hours at room temperature. There are still issues of manufacturing large quantities of either vaccine and ensuring that a sufficient percent of the public is immunized once a vaccine is available.]

Regarding the other mRNA vaccine from Pfizer-BioNTech, the team has completed an analysis of the first 170 cases of symptomatic COVID-19 as reported in the New York Times. 162 of the cases were in the placebo group, while only eight were in the vaccine group. Of 10 severe cases of COVID-19, nine were in the placebo group. Adverse events were not substantial, in that only 3.7% of volunteers reported fatigue after the second dose and 2% reported headaches. Efficacy in volunteers older than 65 was over 94%.

Treatment News

Researchers in the United Kingdom performed a preliminary evaluation of inhaled nebulized interferon 1-beta as treatment of COVID-19. The study was published in the Lancet Respiratory Medicine and enrolled 101 adults hospitalized with COVID-19 in a placebo-controlled, double-blind study. The endpoint was a change in symptom score during the 14-day dosing period. Patients receiving the interferon product (SNG001) had greater odds of improvement in symptom score by day 15 or 16, and they were more likely to recover to a symptom level of 1 (no limitation of activities). [Editor's comment: This is a very early study, and it requires replication with enough statistical power to determine more meaningful endpoints like mortality, duration of oxygen and ventilatory support, and the duration of hospitalization. These questions were asked in this study, but the power (or the effect) wasn’t there.]

Demonstrating what less-than-rigorous clinical research looks like, the Gamaleya National Center of Epidemiology and Microbiology in Moscow announced that the Sputnik V vaccine is 92% effective. That declaration was made on the basis of only 20 COVID-19 cases in their placebo-controlled clinical trial. The data was released as a press release two days after Pfizer and BioNTech released their preliminary results, also by press release. The analysis evaluated 16,000 volunteers beginning three weeks after their first dose of vaccine. Sputnik V is a two-vector vaccine using both adenovirus 5 and adenovirus 26. [Editor’s comment: It’s essentially impossible to make an efficacy judgement about a vaccine after only 20 cases. Whether the Sputnik V vaccine is ultimately effective — and it may be — will take time to establish.]

Clinical News

Two studies in the *New England Journal of Medicine* (NEJM) look at SARS-CoV-2 in the U.S. military and consider possible lessons for civilian society. The first study examined the transmission of SARS-CoV-2 among U.S. Marine Corps recruits and the efficacy of public health measures in mitigating that spread. After two weeks of home quarantine, approximately 1% of study participants had positive SARS-CoV-2 polymerase chain reaction (PCR) test results, and approximately 2% subsequently became infected during the two-week supervised quarantine period. Phylogenetic analysis of genomes from infected individuals identified shared rooms and shared platoon membership as risks for transmission. A second study described a COVID-19 outbreak on an aircraft carrier, where 1,271 crew members (26.6% of the crew) tested positive for SARS-CoV-2. Among the crew members with laboratory-confirmed infection, 76.9% had no symptoms at the time that they tested positive and 55% had symptoms develop at any time during the clinical course. Since the outbreak, the U.S. Navy has changed its procedures, instituting a "restriction of movement" in an attempt to prevent crew members from bringing the virus onboard and implementing additional testing to identify asymptomatic or pre-symptomatic SARS-CoV-2 carriers.

The Centers for Disease Control and Prevention (CDC) found that mental health-related emergency department visits during the COVID-19 pandemic in children aged 5-11 and 12-17 increased approximately 24% and 31%, respectively. The data were gathered from the CDC’s National Syndromic Surveillance Program and compared to the same time period (Jan. 1 to Oct. 17) in 2019. While there are some limitations to the data, the study emphasizes the need for continued study of the effects of public health emergencies on children’s mental health.

Longer-term outcomes of hospitalized COVID-19 infected patients are still not well understood. A recent observational study examined 60-day outcomes among patients hospitalized with COVID-19 across individuals in 38 hospitals in Michigan. The authors found that nearly 1 in 3 patients died either during hospitalization or within 60 days of discharge and that the remaining patients commonly reported an inability to return to normal activities, physical and emotional symptoms, and financial loss.

**CDC MMWR: Multiple COVID-19 Outbreaks Linked to a Wedding Reception in Rural Maine — August 7–September 14, 2020**

Policy News


Coronavirus and Health Equity

New research finds that among the first 7,868 COVID-19 patients treated at 88 hospitals across the United States, in-hospital mortality and major adverse cardiovascular events did not differ by race/ethnicity, though Black and Latinx patients were disproportionately represented among hospitalizations.

COVID-19 has led to significant changes in the "distribution, sale, purchase, preparation,
and consumption of food in the United States" and public health researchers have published new recommendations for building a more just and equitable retail food environment as a result of these shifts.

**Vox:** 80 Percent of Those Who Died of COVID-19 in Texas County Jails Were Never Convicted of a Crime

**NEJM:** Covid-19 Vaccine Trials and Incarcerated People — The Ethics of Inclusion

**Ethnicity & Health:** "Essential and Undervalued: Health Disparities of African American Women in the COVID-19 Era"

**Journal of Racial and Ethnic Health Disparities:** Racism, COVID-19, and Health Inequity in the USA: a Call to Action

**WebMD:** Homeless Shelters Deal With COVID as Cold Arrives

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## Research News

In a non-peer-reviewed preprint, investigators evaluated the duration of the immune response to SARS-CoV-2 infection. The study measured several aspects of the immune response in 185 COVID-19 cases, including 41 individuals with follow-up at greater than six months. Spike protein antibody titers remained detectable for the entire period, with mild declines seen at six and eight months. There was considerable heterogeneity in response, as seen in other studies. Spike-specific memory B-cells were more numerous at six months than at one month. CD4+ and CD8+ T-lymphocytes declined with a half-life of three to five months. [Editor’s comment: The good news was the durability of the immune response, particularly the anti-spike antibodies. The authors noted they needed more samples in order to establish a more complete profile for the rate of antibody decay. Perhaps, on the basis of this fairly preliminary data, there’s hope immunity may be longer lived after SARS-CoV-2 infection than for the routine respiratory coronavirus, where annual infection occurs frequently.]

Two articles and a cogent synthesizing summary were published in Science regarding the role of neuropilin-1 (NRP1) as a promoting factor for SARS-CoV-2 entry into cells. While ACE2 and TLRPRSS2 have been identified as critical receptors for the SARS-CoV-2 spike protein, it appears that NRP1 also plays a key role in facilitating virus entry and infectivity (also demonstrated in an additional study). Interestingly, NRP1 appears to be abundant on the exposed surfaces of nasal cells, which could be related to the anosmia of COVID-19. [Editor’s comment: Worth exploring, the NRP1 may prove to be a potential target for antiviral therapy — or at least an important element helping to explain the pathogenesis of SARS-CoV-2 infection.]

**Science:** Immune Life History, Vaccination, and the Dynamics of SARS-CoV-2 Over the Next 5 Years

**medRxiv:** Association of Social Distancing and Masking With Risk of COVID-19

**PNAS:** Analysis of Genomic Distributions of SARS-CoV-2 Reveals a Dominant Strain Type With Strong Allelic Associations

**Science Translational Medicine:** Prothrombotic Autoantibodies in Serum From Patients Hospitalized With COVID-19
Testing News

Maintaining a COVID-19-safe environment for students, staff, and faculty at U.S. universities has been an enormous challenge. The CDC MMWR published an article regarding Duke University’s testing program, which — as of the span of the sampling (Aug. 2 to Oct. 11, 2020) — has been quite successful. Duke required all students to quarantine for 14 days prior to arrival on campus and agree to an honor code of infection prevention behaviors. Students were given an app to log their symptoms (“SymMon”) and were required to do daily entries. The university implemented a 5-to-1 pooling methodology to frequently screen students using an RT-PCR assay system developed in-house. The methodology was reagent sparing at a time when diagnostic reagents were in short supply. Asymptomatic students were screened once or twice a week. An increased amount of directed testing was carried out after index cases. During the time period of the study, 68,913 specimens from 10,265 graduate and undergraduate students were tested. 84 specimens were positive — 51% from asymptomatic individuals. Contact tracing identified 27.4% of the infections. Student athletes were screened using a different strategy, as were the faculty. [Editor’s comment: As a former Duke employee, I have been very impressed at how well the university has managed during the pandemic. Sustainability will be key, and the program clearly wasn’t cheap. The good news, however, appears to be that with testing and contact tracing, on-campus life might be possible.]

The Food and Drug Administration has authorized the first at-home molecular testing for SARS-CoV-2. The new product, the Lucira COVID-19 All-in-One Test Kit, uses loop-mediated isothermal amplification that combines a single tube detection system with a simple device that gives a positive/negative readout. The test had, according to company data, a 94% positive predictive value compared to standard PCR in a sample of patients and a 98% negative predictive value compared to standard PCR. However, the details of that comparison, as well as standard sensitivity and specificity data, were not available yet. The emergency use authorization is for use at home for patients age 14 and older, and the test requires roughly 30 minutes to complete. It requires a doctor’s prescription and may also be suitable for point-of-care use in a medical office. The cost is expected to be about $50 for the kit. [Editor’s comment: We need more data about the assay — particularly real sensitivity and specificity information. If the sensitivity is too low, people may falsely assume they are not infected or contagious, so knowledge about the sensitivity will be critical to best advise patients. As another issue, patients are supposed to report their results to a physician, who hopefully will relay the information to public health authorities, but rapid tests like this one make tracking the public health status of the epidemic more of a challenge.]

Other COVID-19 News

*PloS Biology: Superspreading Events in the Transmission Dynamics of SARS-CoV-2: Opportunities for Interventions and Control*

*STAT News: With a Meteoric Rise in Deaths, Talk of Waves is Misguided, Say COVID-19 Modelers*

*AAMCNews: Anthony Fauci, MD, Sees a Return to “a Considerable Degree of Normality” by Fall 2021*

*AAMCNews: COVID-19 Cases are Surging. Is it Possible to Gather Safely for the Holidays?*
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