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2020-05-04 DAILY UNM GLOBAL HEALTH COVID-19 BRIEFING

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DAILY UNM GLOBAL HEALTH COVID-19 BRIEFING

May 4, 2020

Executive Summary

NM convalescent plasma call. NM case counts. Gallup lockdown continues. Tribal federal relief delay. Childcare demand drops. Polling open for primaries. Non-US world funds R&D. South Korea eases more. Soft quarantine inefficiency. Chinese interventions. Transmission window. December French case. CDC on law enforcement, essential errands. NEJM on telemedicine. Practice guidelines for: ECMO, pneumonia, nuclear medicine SOP. FDA antibody test restrictions. Africa testing differences. PCR assay sensitivity. Wuhan antibody tracking. Hydroxychloroquine toxicity. Remdesivir mechanism. Tocilizumab study inconclusive. SARs-CoV-2 structure. 28 new trials. Immunology and exercise. Synthetic SARS-CoV-2. IgM and IgG responses. Bacterial and fungal coinfection. Youth mental health challenges.

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Our continuously curated practice guidelines in the context of COVID-19 can be found [here](#).

Our continuously curated therapeutic evidence is maintained [here](#).

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NM Highlights

- [BPL Plasma seeks donations from COVID-19-recovered patients for testing](#)
BPL Plasma is asking for 18 to 65-years-old people who are at least 2 weeks recovered from COVID to donate convalescent plasma for potential use for therapeutics. Donors must provide documented evidence of a positive COVID-19 laboratory test and a negative post-illness COVID-19 swab test. Donors must be symptom-free for at least 28 days before making donation. There are two Albuquerque donation sites. Register online here.
- [New Mexico reports 5 more COVID-19 deaths and 189 additional cases](#)
As of Monday (5/4), the total positive cases and total deaths in the state are 4,031 and 156, respectively. The state has performed 81,720 tests, there are 181 individuals currently hospitalized for COVID-19, and 842 COVID-19 cases have recovered. [New NMDOH portal featuring epidemiologic breakdown of cases](#).
- [Governor extends Gallup's citywide lockdown order to Thursday, May 7](#)
The weekend lockdown initially went into effect on Friday and was set to expire on Monday (5/4). The extended lockdown declaration closes all roads into Gallup, limits business hours, restricts how many individuals can travel in a car at once, and directs Gallup residents to remain at home except for emergency outings.
- [New Mexico tribes await federal relief money for COVID-19 pandemic](#)
More than 50% of people COVID-19 infected in NM are Native American. But the Navajo Nation still hasn't received substantial support from the Coronavirus Aid, Relief, and Economic Security Act, which Congress passed in late March. The act allocated \$8 billion directly to the tribes to be split among 574 federally recognized tribal governments – 22 of which are in New Mexico.
- [NM childcare centers and preschools experience drop in demand](#)
Childcare centers and preschools have experienced a massive drop in demand since the first reported cases of COVID-19 in NM. Approximately 500 childcare centers have remained open and are serving 15-30% of the children they normally would.

Some pre-K centers are attempting to reach children through distance learning.

- [Polling places will be open for the primaries](#)

A Public Health Emergency Order from 4/30 states the polling facilities will be subject to certain social distancing restrictions. New Mexicans are advised to apply for absentee ballot and to cast their ballots by mail.

International Highlights

- [World leaders \(not including US\) pledge \\$8 billion to fight pandemic](#)

Leaders from several countries have pledged \$8 billion for vaccine research, development, and delivery in the fight against COVID-19. EU officials said pharmaceutical companies that receive the funding will not be asked to forgo intellectual property rights on the new vaccine and treatments, but they should commit to making them available worldwide at affordable prices.

- [South Korea to relax social distancing rules further](#)

Seoul has seen a dramatic reduction in new cases from over 900/day to approximately 10/day, following extensive population testing and contact tracing. Starting May 6, South Korea will allow a phased reopening of businesses and public facilities and permit social gatherings that abide by disinfection guidelines.

Epidemiology Highlights

- [Universality of COVID-19 growth in four continents and inefficiency of soft quarantine](#)

The authors analyzed the growth of the cumulative number of confirmed infected cases by COVID-19 until March 27, 2020, from countries of Asia, Europe, North America, and South America. Power law curves for countries were shown to be statistically highly correlated, suggesting the universality of such curves around the world. Social isolation of individuals plus identifying and isolating infected individuals daily will allow governments to reach the flattening of the power-law curves.

- [Effect of non-pharmaceutical interventions to contain COVID-19 in China](#)

Nature: With limited availability of effective pharmaceutical therapies for SARS-COV-2, non-pharmaceutical interventions (NPIs) have become increasingly necessary. Early detection and isolation of cases in China prevented more infections than travel restrictions and contact reductions alone, but combined NPIs achieved the strongest and most rapid effect.

- [Most COVID-19 transmission occurs before and within 5 days of symptom onset](#)

JAMA 05/01: The Taiwan CDC conducted a prospective case-ascertained study that enrolled all the initial 100 confirmed cases (including 9 asymptomatic patients) in Taiwan between January 15 and March 18, 2020, and their 2761 close contacts. All contacts were followed up until 14 days after the last exposure to the index case. People with COVID-19 were found to be most infectious to others before and within 5 days of symptom onset. None of the 9 asymptomatic case patients transmitted to a secondary case, but there was significant transmission by pre-symptomatic cases. The pattern of high transmissibility near and before symptom onset reinforces the need for social distancing to prevent transmission.

- [French hospital discovers case from December after retesting samples](#)

France confirmed its first three COVID-19 cases on Jan 24, 2020. However, retesting earlier samples from hospital patients originally screened for flu virus reveals a COVID-19 patient on December 27, 2019. This patient had no known sick contacts nor travel, raising the possibility of COVID-19 cases even before this date.

Healthcare Policy Recommendations

- [CDC issues updated COVID-19 guidance for law enforcement personnel](#)

The guidelines outline symptoms and transmission of COVID-19, protection from exposure, recommended personal protective equipment (PPE), and what needs to be done if close contact occurred during apprehension.

- [Update: CDC guidelines on essential errands](#)

CDC guidelines on protecting from infection during essential errands include new guidance on getting gasoline. If available, use disinfectant wipes on handles and buttons before fueling. After fueling, use hand sanitizer, and wash hands upon

returning home.

- [Audio interview: Judd E. Hollander, M.D.](#)

Dr. Hollander, associate dean for strategic health initiatives at Sidney Kimmel Medical College of Thomas Jefferson University, discusses how health systems can use telemedicine services to their advantage during the COVID-19 pandemic in order to decrease exposure in both inpatient and outpatient settings. Corresponding article can be found [here](#).

Practice Guidelines

- [Extracorporeal life support organization in COVID-19: interim guidelines](#)

This is a 'living document' developed by the ELSO COVID-19 Working Group on extracorporeal membrane oxygenation (ECMO) support. The group will remain active for the duration of the pandemic and during any future COVID-19 outbreaks to revise the guidelines as new information and evidence become available. The most up-to-date version of the guideline document and all previous iterations can be found on the ELSO website www.else.org.

- [Chinese protocol for COVID-19 pneumonia diagnosis and treatment](#)

Chinese Medical Journal provides a summary of COVID-19 -related evidence and the guidelines to manage the disease.

- [The US guidance on operating procedures for a nuclear medicine facility](#)

The guidance provided by The American College of Nuclear Medicine aims to assist nuclear medicine facilities in developing standard operating procedures for managing a patient under investigation for COVID-19. The recommendations are based on the current best practices narrated from current literature, as well as publications from the WHO and CDC.

Testing

- [U.S. FDA tightens regulations for antibody tests](#)

The FDA expects producers of coronavirus antibody tests to now submit requests for emergency use authorization of their tests within 10 days from when the tests are validated. To prevent fraud, the FDA website will list compliant and non-compliant test manufacturers.

- [Some smaller African countries have higher rates of testing compared to more populated countries](#)

Concerns about testing limitations include lack of testing kits due to international competition, stay at home orders preventing access to testing sites, politics, and stigma.

- [PCR Assay from U.S. CDC, China CDC, and Institut Pasteur Deemed Highly Sensitive](#)

The sensitivities of SARS-CoV-2 RT-PCR tests developed by Charite (Germany), HKU (Hong-Kong), China CDC (China), U.S. CDC, and Institut Pasteur, Paris (France) were assessed on SARS-CoV-2 cell culture supernatants and clinical samples. Although all RT-PCR assays performed well for SARS-CoV-2 detection, assays from Institut Pasteur (IP2, IP4), N. China CDC, and US CDC were found to be the most sensitive.

- [Wuhan study demonstrates COVID-19 antibodies can potentially track disease progression](#)

In a retrospective study involving 112 COVID positive patients, 58 (51.79%) were positive for both IgM and IgG, 7 (6.25%) were negative for both, 1 (0.89%) was positive for only IgM, and 46 (41.07%) were positive for only IgG. IgM antibody appeared within a week after infection and remained elevated for 1 month, while IgG was produced 10 days after infection and remained elevated for longer than 1 month. These results demonstrated that serological tests could be powerful approach for the early diagnosis of COVID-19.

Drugs, Vaccines, Therapies, Clinical Trials

- [Hydroxychloroquine & QT prolongation in COVID-19](#)

Two recent studies in *JAMA Cardiology* provided additional evidence that hydroxychloroquine treatment is associated with prolonged QTc interval in COVID-19. In the first study, 10 of 90 patients had hydroxychloroquine stopped early for adverse events, including one patient who developed torsades de pointes (doi.org/doi:10.1001/jamacardio.2020.1834). In the second

study, 1/3 of those on hydroxychloroquine and azithromycin developed QTc of 500 ms or more, versus 5% on hydroxychloroquine alone (doi.org/doi:10.1001/jamacardio.2020.1787). An accompanying editorial discussed concerns raised by the two studies and the previously reported Brazilian study by Borba.

- [Remdesivir inhibits from SARS-CoV-2 RNA-dependent RNA polymerase: Mechanism of action](#)

The replication of SARS-CoV-2 requires the viral RNA-dependent RNA polymerase (RdRp), the target of the antiviral drug, remdesivir, which acts as a non-obligate chain terminator.

- [Multicenter study of Tocilizumab in patients with severe COVID-19](#)

A cohort of 63 hospitalized adults with severe Covid-19 received a trial of Tocilizumab in a prospective, open, single arm study. No evaluation of efficacy was possible in this single-arm study.

- [SARS-CoV-2 S structure may further inform vaccine design](#)

Using a site-specific mass spectrometric approach, the authors mapped the glycan-processing states across the trimeric viral spike. They show how SARS-CoV-2 S glycans differ from typical host glycan processing, which may have implications in viral pathobiology and vaccine design.

- [28 New COVID-19 Trials registered today at clinicaltrials.gov](#)

Treatment trials: duvelisib, favipiravir, hydroxychloroquine/azithromycin/zinc, convalescent plasma. At time of writing, a total of 1122 were active, 51 completed, and 3 posted results.

Other Science

- [The first holistic immunological model of COVID-19: no extreme physical activity warning](#)

The model explains how the outcome of the first 10-15 days after infection is dependent on the cumulative dose of viral exposure and the efficacy of the local innate immune response. Extreme physical activity and hyperventilation during early stages facilitates early direct penetration of high numbers of virus particles in the lower airways and the alveoli, without impacting airway's mucosae covered by neutralizing antibodies. This allows the virus to bypass the mucosal immune barrier of the upper airway. The primary factor to determine severity of the disease course is whether the virus or the adaptive immune response reaches the lungs first.

- [Rapid method for producing a synthetic version of SARS-CoV-2](#)

Nature: A yeast-based synthetic genomics platform was shown to genetically reconstruct diverse RNA viruses, including members of the Coronaviridae family. Based on this platform researchers were able to engineer and resurrect chemically-synthesized clones of the recent epidemic SARS-CoV-2 in only a week after receipt of the synthetic DNA fragments. This enables generation and functional characterization of evolving RNA virus variants—in real-time—during an outbreak.

- [Kinetics of SARS-CoV-2 specific IgM and IgG responses in COVID-19 patients](#)

The authors investigated IgM and IgG responses against SARS-CoV-2 nucleocapsid (N) and spike (S) protein after symptom onset in ICU and non-ICU patients. A series of blood samples were collected from 11 ICU patients and 27 non-ICU patients for up to three weeks. N and S specific IgM and IgG (N-IgM, N-IgG, S-IgM, S-IgG) in non-ICU patients increased after symptom onset. The combined detection of N and S specific IgM and IgG could identify up to 75% of SARS-CoV-2 infected patients in the first week. S-IgG was significantly higher in non-ICU patients than in ICU patients in the third week while N-IgG was significantly higher in ICU patients than in non-ICU patients. The increase of S-IgG was positively correlated with the decrease of C-reactive protein (CRP) in non-ICU patients. N and S specific IgM and IgG increased gradually after symptom onset and can be used for detection of SARS-CoV-2 infection.

- [Bacterial and fungal coinfection in individuals with coronavirus: a review](#)

A literature review showed that most studies did not identify or report bacterial/fungal coinfection (61%). For COVID-19, 8% patients were reported as experiencing bacterial/fungal co-infection during hospital admission. On secondary analysis, 72% of patients reported received antimicrobial therapy. No antimicrobial stewardship interventions were described. For non-COVID-19 cases bacterial/fungal co-infection was reported in 11% of patients. Broad-spectrum antibiotic use was reported. Thus, there is paucity of data to support the association with respiratory bacterial/fungal co-infection.

- [The COVID-19 pandemic has researchers concerned about the mental health of children and teens](#)
YouTube Video from Science (AAAS): Here's what scientists are doing to investigate the challenges they face, and how those might impact their social and emotional well-being.

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