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### 2020-06-03/04 DAILY UNM GLOBAL HEALTH COVID-19 BRIEFING

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## DAILY UNM GLOBAL HEALTH COVID-19 BRIEFING

June 3-4, 2020

### Executive Summary

**NM Highlights:** Navajo Nation to end weekend curfew. NM case count. Navajo Nation case updates. Food distribution by PepsiCo. APS to get funding.

**US Highlights:** 5 vaccine candidates. Arizona's increased cases. Some states postpone primaries. Pork plant infections.

**Economics, Workforce, Supply Chain, PPE:** Impact on global supply chains. Residency selection process disrupted. Facemask filtration efficiency. Resources for underserved countries.

**Epidemiology Highlights:** Morbidity and mortality in Africa.

**Healthcare Policy Recommendations:** Need for social distancing. Psychological support guide. Return to work guidelines.

**Practice Guidelines:** Anesthesia recommendations for ECT. Extracorporeal membrane oxygenation outcomes.

**Testing:** Roche Elecsys IL-6 test is authorized by FDA to identify severe inflammatory response.

**Drugs, Vaccines, Therapies, Clinical Trials:** HCQ RCT does not show disease prevention. Lancet HCQ study retraction. Adjunctive convalescent plasma did not show clinical improvement. Mixed remdesivir results. Virtual drug screening. Heparin improved survival. Moderna phase 3. Skin science for vaccine development. ECMO therapy. 48 new clinical trials.

**Other Science:** Androgens and poor male outcomes. Trust in science enhances prevention compliance. High VTE prevalence in critically ill.

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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](#).

You may submit content for future briefings [here](#).

### NM Highlights

- [Navajo Nation to end 57-hour weekend curfew and lockdown](#)

While the weekend curfew and lockdown will end, the 7-day nightly curfew will continue. The nightly curfew is from 8 p.m. - 5 a.m. The Navajo Nation has reported 5,533 COVID-19 cases and 248 deaths.

- [NM reports 8 more COVID-19 deaths and 218 additional cases on June 4](#)

As of today (6/4), the total positive cases and total deaths in the state are 8,353 and 383, respectively. The state has performed 217,757 tests, there are 170 individuals currently hospitalized for COVID-19, and 3,115 COVID-19 cases have

recovered. [NMDOH portal featuring epidemiologic breakdown of cases.](#)

- [Navajo Nation reports 54 new cases of COVID-19 and 4 additional deaths on June 2](#)

The Navajo Department of Health reported 54 new cases of COVID-19 and four additional deaths Tuesday. The total number of confirmed COVID-19 cases for the Navajo Nation has reached 5,533 with 248 deaths.

- [PepsiCo's Food for Good delivered 94,000 meals to tribal communities](#)

Food for Good, a nutrition program by PepsiCo, distributed more than 94,000 meals to Pueblo communities over the last several weeks. This is all part of a \$60 million initiative to feed at-risk communities during the COVID-19 pandemic.

- [APS anticipating \\$26M from CARES Act](#)

Albuquerque Public Schools is expecting nearly \$26 million in Coronavirus Aid, Relief and Economic Security Act funds to help pay for device and internet costs, personal protective equipment, and cleaning supplies for classrooms and buses.

## US Highlights

- [Trump administration selects five COVID vaccine candidates to begin testing in late July](#)

*NY Times:* The companies are: Moderna Inc, AstraZeneca Plc, Pfizer Inc, Johnson and Johnson, Merck and Co Inc. A vaccine is expected by the end of the year with millions of doses by 2021.

- [Arizona's highest single-day rise in cases - state experts blame ending lockdown](#)

*Newsweek:* The state reported 1,127 new infections of the novel virus, the highest number reported in a single day since the outbreak began, according to the dashboard updated by the Arizona Department of Health Services. The state also reached a new record of more than 1,000 hospitalizations due to COVID-19 on Monday, suggesting the state is seeing an increase in more serious infections likely due to not following the CDC guidelines.

- [4 states held primaries this week and 5 postponed](#)

*USA Today:* There are multiple presidential primary elections taking place around the country Tuesday as election season chugs forward amid the coronavirus pandemic. NM, SD, DC, MT held primaries, IN, MD, PA & RI postponed.

- [Tyson Foods: 591 workers at Storm Lake pork plant test positive for COVID-19](#)

*Sioux City Journal:* That's a quarter of the 2,303 workers who work at the facility and were tested for COVID-19. The vast majority of the plant's workers reside in Buena Vista County, which had 854 total cases of the virus with its first COVID-19-related death. If all the workers who tested positive lived in Buena Vista County, they would account for roughly 70 percent of the Northwest Iowa county's total cases.

## Economics, Workforce, Supply Chain, PPE Highlights

- [Duration of lockdown and spatial extent has great impact on global supply chains](#)

*Nature:* The authors modelled four different sets of pandemic scenarios, three of which (36 scenarios in total) represent different spread extents and containment responses to the COVID-19 pandemic. The spatial extent of the pandemic is the most important driver of the global cost. It was found that the global supply-chain effects increase almost fourfold to 12.6%. The modeled impacts of global lockdowns in response to COVID-19 are greater still—26.8% of global GDP. The second insight from the model is the importance of propagation through global supply chains—even countries that are not directly affected by the virus experience large losses, and low- and middle-income countries are more vulnerable to indirect effects.

- [COVID-19 disrupts residency selection process, test centers close](#)

*JAMA:* Disruptions caused by COVID-19 may result in an increased number of applications this year. In 2019-2020, applicants from US medical schools applied to an average of 65 programs, and international medical graduates (IMGs) applied to an average of 137 programs. Due to testing center closures, many applicants are unable to take portions of the US Medical Licensing Examination (USMLE). This is especially critical for IMGs who must pass the Step 2 Clinical Skills Examination to obtain certification from the Educational Commission for Foreign Medical Graduates and apply to US residency programs. Medical schools shortened clerkships shifted to virtual rotations and canceled away electives. Conducting virtual interviews

or waiving requirements for USMLE scores and letters of recommendation, will be necessary. The other recommendations include emphasis on narrative aspects of the application, encouraging students to focus NOT on quantity but quality of their applications, and capping the number of interviews a student can accept.

- [Household materials selection for homemade cloth face coverings](#)

*Nano Letters:* The authors evaluated the filtration properties of natural and synthetic materials using a modified procedure for N95 respirator approval. Cotton, polyester, nylon, and silk had filtration efficiency of 5-25%, polypropylene spunbond had filtration efficiency 6-10%, and paper-based products had filtration efficiency of 10-20%. An advantage of polypropylene spunbond is that it can be simply triboelectrically charged to enhance the filtration efficiency (from 6 to >10%), without any increase in pressure (stable overnight and in humid environments). Cotton, polyester, and polypropylene multilayered structures can meet or even exceed the efficiency of materials used in some medical face masks.

- [Vaccine group plans agreement to secure resources for underserved countries](#)

*Reuters:* GAVI vaccines agree to launch Advance Market Commitment (AMC) for future vaccines to secure resources. GAVI, a public-private partnership backed by the Bill & Melinda Gates Foundation, WHO, the World Bank, UNICEF and others, arranges bulk buys to reduce vaccine costs for poor countries. This AMC is an incentive for manufactures to invest in trial and production as well as prevent wealthier countries from buying all future vaccines.

## Epidemiology Highlights

- [Morbidity and mortality of COVID-19 in Africa](#)

*Am J Tropical Med Hygiene:* There is lower morbidity and mortality due to COVID-19 in Africa than globally. This review examined the merits of various hypotheses advanced to explain this phenomenon, including low seeding rate, effective mitigation measures, a youthful population, favorable weather, and possible prior exposure to a cross-reactive virus. Having a youthful population and favorable weather appears compelling, particularly the combined effect. However, progression of the pandemic in the region and globally may dispel these hypotheses in the coming months.

## Healthcare Policy Recommendations

- [Ongoing need for social distancing and control measures after a "lockdown"](#)

*European Respiratory Journal:* Most countries with significant outbreaks have introduced social distancing or "lockdown" measures to reduce viral transmission but the key question is when, how, and to what extent these measures can be lifted. Data on daily numbers of newly confirmed cases and mortality were used to fit regression models estimating trajectories, doubling times and the reproduction number (R0) of the disease before and under the control measures. The estimates of R0 before lockdown (2.0 - 3.7 for USA, Italy, Spain, France and UK) were broadly consistent with those previously published. There was little evidence to suggest that the restrictions had reduced R far below 1 in many places. The data are more consistent with a need to adopt a "new normal" that can provide the optimal balance between allowing economic activity while ensuring very substantial reductions (at least 80%) in prior social contacts.

- [Guide to psychological support for healthcare workers](#)

*Inter-Agency Standing Committee:* The Inter-Agency Standing Committee released a "Basic Psychosocial Skills: Guide for COVID-19 Responders" to aid in self-care, supportive communication for others, offering practical support, supporting those who are in emotional distress, and resources for law enforcement, refugee situation, those grieving, etc. It highlights the importance of personal wellness in order to be able to care for others. There are sample cases for various scenarios and ways to help, as well as meditation techniques.

- [Return to work guidelines for the COVID-19 pandemic](#)

*Occupational Medicine:* A panel of experts was convened by the Spanish Association of Occupational Medicine (AEEMT) to elaborate return to work guidelines for high-risk workers, low-risk workers, and for direct COVID-10 contacts. Practical schemas are suggested.

## Practice Guidelines

- [General anesthesia recommendations for ECT during the COVID-19 pandemic](#)

*The Journal of ECT*: The Weill Cornell Medicine- New York Presbyterian Hospital Anesthesiology and Psychiatry departments collaborated to develop guidelines for electroconvulsive therapy anesthesia during COVID-19 pandemic

## Testing

- [Roche inflammatory response test receives FDA emergency use approval for COVID-19 patients](#)

Roche (SIX: RO, ROG; OTCQX: RHHBY) announced today that the U.S. Food and Drug Administration (FDA) has issued an Emergency Use Authorization (EUA) for the Elecsys® IL-6 test. This test measures levels of the biomarker interleukin 6 (IL-6) and can be used to help identify patients with confirmed COVID-19 disease who could be at high risk of intubation with mechanical ventilation. Hospitals and reference laboratories can run the test on Roche's cobas e® analysers which are widely available around the world. These fully-automated systems can provide test results in approximately 18 minutes, with a test throughput of up to 300 tests/hour, depending on the analyser.

- [Clearance and Persistence of SARS-CoV-2 RNA in COVID-19 patients](#)

*Journal of Medical Virology*: SARS-CoV-2 viral clearance profile is crucial to establish a re-testing plan on discharge and ending isolation of patients. This study aimed to evaluate the number of days patients needed to achieve undetectable levels of SARS-CoV-2 in upper respiratory tract specimens. Patients were grouped by management of illness (treated in home vs. in hospital) and also by whether they achieved two negative test results or had continued positive tests within the study timeframe. Patients' RT-PCR results were also correlated with their immune response testing results. The study found that most patients tested positive for more than two weeks and that persistence of viral RNA is not necessarily associated with severe disease but may result from a weaker immune response instead.

## Drugs, Vaccines, Therapies, Clinical Trials

- [Hydroxychloroquine did not prevent illness compatible with COVID-19 in a double-blind RCT](#)

*NEJM*: A randomized, double-blind, placebo-controlled trial tested HCQ as postexposure prophylaxis. They enrolled adults with a high- or moderate-risk exposure to SARS-CoV-2. Within 4 days after exposure, the authors randomly assigned participants to receive either placebo or HCQ (N=821 asymptomatic participants). 87.6% reported a high-risk exposure to a confirmed Covid-19 contact. The incidence of new illness compatible with Covid-19 did not differ significantly between participants receiving HCQ (11.8% and those receiving placebo 14.3%; the absolute difference was -2.4 percentage points (95% confidence interval, -7.0 to 2.2; P=0.35). Side effects were more common with HCQ than with placebo (40.1% vs. 16.8%), but no serious adverse reactions were reported.

- [Study authors retract Lancet article suggesting no benefit of hydroxychloroquine for COVID-19 patients](#)

*The Lancet*: Following expressions of concern, authors retracted an influential article on hydroxychloroquine originally published on May 22. The original article found there was no benefit of treatment with chloroquine or hydroxychloroquine in hospitalized COVID-19 patients and raised concerns regarding the risk/benefit ratio of these therapies outside of the treatment of autoimmune diseases. However, the authors were not able to obtain an independent audit of the data underpinning these conclusions, and the Lancet published their retraction of the article on June 4.

Here is the official [retraction](#).

- [Adjunctive convalescent plasma did not result in a shorter time to clinical improvement](#)

*JAMA*: Open-label, multicenter, randomized clinical trial included 103 participants with severe/life-threatening COVID-19 was terminated early after 103 of a planned 200 patients were enrolled. Clinical improvement within 28 days was not significantly improved for the convalescent plasma group (51.9% 27/52) compared to the control group (43.1% 22/51) (difference, 8.8% [95% CI, -10.4% to 28.0%]; hazard ratio [HR], 1.40 [95% CI, 0.79-2.49]; P = .26). There was no significant difference in 28-day mortality (15.7% vs 24.0%; OR, 0.65 [95% CI, 0.29-1.46]; P = .30) or time from randomization to discharge (51.0% vs 36.0% discharged by day 28; HR, 1.61 [95% CI, 0.88-2.93]; P = .12). Convalescent plasma treatment was associated with a negative

conversion rate of viral PCR at 72 hours in 87.2% of the convalescent plasma group vs 37.5% of the control group (OR, 11.39 [95% CI, 3.91-33.18];  $P < .001$ ).

- [Remdesivir results mixed in moderate COVID-19 patients](#)

*Reuters*: A late-stage safety and efficacy trial of remdesivir in 600 patients with moderate COVID-19 found that 76% of patients treated for 5 days and 70% of patients treated for 10 days achieved clinical improvement compared to only 66% of patients given standard care. While the 5-day treatment group did achieve a significant increase in the percentage of patients who were improved, the percentage of patients who were clinically improved in the 10-day treatment group did not achieve significance. These findings indicate that remdesivir has some utility in treatment of moderate COVID-19 patients, but benefits are likely modest and protocols need to be clarified.

- [Virtual screening-driven drug discovery of SARS-CoV2 enzyme inhibitors](#)

*Journal of Biomolecular Structure and Dynamics*: With the aid of bioinformatics and computational modelling, 97 antiviral secondary metabolites from fungi were docked onto five SARS-CoV2 enzymes involved in viral attachment, replication, post-translational modification, and host immunity evasion infection mechanisms followed by molecular dynamics simulation and in silico ADMET prediction (absorption, distribution, metabolism, excretion and toxicity) of the hit compounds. Thus, three fumiquinazoline alkaloids scedapin C (15), quinadoline B (19) and norquinadoline A (20), the polyketide isochaetochromin D1 (8), and the terpenoid 11a-dehydroxyisoterreulactone A (11) exhibited high binding affinities on the target proteins, papain-like protease (PLpro), chymotrypsin-like protease (3CLpro), RNA-directed RNA polymerase (RdRp), non-structural protein 15 (nsp15), and the spike binding domain to GRP78. Of the five top-scoring metabolites, quinadoline B (19) was predicted to confer favorable ADMET values, high gastrointestinal absorptive probability and poor blood-brain barrier crossing capacities.

- [Search for natural inhibitors of SARS-CoV2 protease by molecular docking and simulation](#)

*Journal of Biomolecular Structure and Dynamics*: The authors performed in silico screening of compounds from *Curcuma longa* L. against Mpro protein inhibition. Employing a combination of molecular docking, scoring functions, and molecular dynamics simulations, 267 compounds were screened by docking on Mpro crystallographic structure. X-ray crystallographic structure of the SARS-CoV2 Mpro protein demonstrated the significance of Glu166, Cys141, and His41 residues involved in protein dimerization and its catalytic function.

- [The association between treatment with heparin and survival in patients with Covid-19](#)

*Journal of Thrombosis and Thrombolysis*: In a prospective study, clinical data were collected from the 2075 patients with Covid-19, admitted in 17 hospitals in Spain. Heparin had been used in 1734 patients and was associated with lower mortality when the model was adjusted for age and gender, with OR (95% CI) 0.55 (0.37-0.82)  $p = 0.003$ . This association remained significant when saturation of oxygen  $< 90\%$ , and temperature  $> 37$  degrees C were added to the model with OR 0.54 (0.36-0.82)  $p = 0.003$ , and also when all the other drugs were included as covariates OR 0.42 (0.26-0.66)  $p < 0.001$ .

- [Moderna phase 3 trial will begin in July](#)

*Forbes*: The phase 3 trial of Moderna's experimental vaccine for COVID-19 will begin in July with 30,000 patients. A phase 3 trial follows testing for safety, and is designed as a randomized controlled trial to establish benefit of the vaccine over placebo. The trial will include primarily US sites but also international sites, and is the final step before potential approval by the FDA for general use.

- [Advances in skin science may enable development of COVID-19 vaccine](#)

*Journal of the American Academy of Dermatology*: A commentary and review showed the potential of cutaneous delivery strategies for vaccines and immune-modulation therapies via biotechnology such as microneedle arrays. These approaches may allow for the development of novel vaccine strategies and immunotherapies, as well as negative immunization strategies for immune regulation in the treatment of systemic allergy and autoimmune diseases.

- [Extracorporeal membrane oxygenation for respiratory failure in COVID-19 patients](#)

*Canadian Journal of Anesthesia*: In a prospective case series study the data were collected on 12 COVID-19 patients admitted for ECMO therapy continuing for 12 days. 67% of patients were discharged from the ICU and 33% died. All patients were treated with inhaled nitric oxide, neuromuscular blockade, and prone positioning prior to ECMO therapy. All patients received heparin treatment. Common complications of disease in ECMO patients included acute kidney injury (92%),

thrombosis (92%), and ventilator associated pneumonia (83%). For patients weaned from ECMO, biological data showed an increase in lymphocyte count (from 560 mm<sup>-3</sup> to 1,280 mm<sup>-3</sup>) and a decrease in fibrinogen (from 6.8 gL<sup>-1</sup> to 3.6 gL<sup>-1</sup>). There was an increase in PaO<sub>2</sub>/FIO<sub>2</sub> ratio from 129 mmHg to 268 mmHg, and an initial decrease in respiratory compliance from 29.3 to 19.3 mLmmHg<sup>-1</sup>, followed by an increase to 26.8 mLmmHg<sup>-1</sup>.

- [48 new clinical trials for COVID-19 therapies registered over the course of 2 days](#)

Clinicaltrials.gov: 48 new trials of therapies for COVID-19 were registered at clinicaltrials.gov between June 3 and June 4. The drugs to be studied include Colchicine, Hydroxychloroquine, Dexmedetomidine, Ruxolitinib, Nivolumab, Tofacitinib, Conestat Alfa, Mesenchymal Stem Cell, LAU-7b, KB109, Opaganib, Bacillus Calmette-guerin, Axatilimab. At time of writing, a total of [1841](#) clinical trials were active, [119](#) completed, and [4](#) posted results.

## Other Science

- [Androgens may explain why men have worse COVID-19 outcomes than women](#)

*Science*. Data from around the world show that men have a greater risk of severe illness and death from COVID-19 than women. More data are now generated supporting the hypothesis that androgens appear to boost the virus' ability to get inside cells. The data include outcomes in men with prostate cancer and lab studies of how androgens regulate key genes. And preliminary observations from Spain suggest that a disproportionate number of men with male pattern baldness—which is linked to a powerful androgen—end up in hospitals with COVID-19. Researchers are rushing to test already approved drugs that block androgens' effects, deploying them early in infection in hopes of slowing the virus and buying time for the immune system to beat it back.

- [Trust in science is critical complying with COVID-19 prevention guidelines](#)

*Psychology, Health & Medicine*: A structural equation model to identify individual characteristics that make a person more/less likely to comply with COVID-19 prevention guidelines showed that COVID-19 risk perception and trust in science both independently predict compliance with COVID-19 prevention guidelines, while the remaining variables in the model (political conservatism, religious orthodoxy, conspiracy ideation and intellectual curiosity) do so via the mediating role of trust in science.

- [High prevalence of venous thromboembolism \(VTE\) in critically ill patients with COVID-19](#)

*British Journal of Haematology*: This retrospective cohort study of ICU adults with COVID-19 (N=91) found that 26.1% of patients had VTE during their hospitalization. Elevated creatinine at time of hospital admission and hospital length of stay were associated with a VTE diagnosis. Patient outcomes were similar for VTE and non-VTE patients in contrast to previous reports suggesting worse outcomes amongst patients found to have VTE.

- [Oxford Royal College of General Practitioners clinical informatics digital hub](#)

*JMIR* preprint: The paper describes the rapid design and development of the Oxford Royal College of General Practitioners Clinical Informatics Digital (ORCHID) Hub, and its first two platforms. The Surveillance Platform will provide extended primary care surveillance, while the Trials Platform will be a streamlined clinical trials platform integrated into routine primary care practice. The authors applied the FAIR (Findable, Accessible, Interoperable and Reusable) metadata principles to a new, integrated digital health hub that will extract routinely collected general practice electronic health data for use in clinical trials and provide enhanced communicable disease surveillance. The hub will be a bottom-up, professionally led network ensuring benefits for member practices, health service and the population served. Data will only be used for SQUIRE (surveillance, quality improvement, research and education) purposes. There has already been a positive response from practices and the number in the network has doubled since February 2020 to over 1,150. COVID-19 Surveillance has delivered a trebling of virology sites to 293 (target 300), helping collect the largest ever weekly total of surveillance swabs in the UK as well as over 3,000 SARS-CoV-2 serology samples. Practices are recruiting to the PRINCIPLE trial and follow-up of these participants will take place through ORCHID. These initial outputs demonstrate the feasibility of ORCHID to provide an extended national, digital health hub.



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