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2020-06-29/30 DAILY UNM GLOBAL HEALTH COVID-19 BRIEFING

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UNM GLOBAL HEALTH COVID-19 BRIEFING

The Final Edition
June 29-30, 2020

Executive Summary

NM Highlights: NM cases update. ABQ nursing home hit hard. UNM student family housing closure. White Sands National Park reopening. 52% of federal COVID-19 relief money for tribal communities. Bill signed to help NM taxpayers.

US Highlights: Polarization of political elite response on Twitter.

International Highlights: China's military to use Ad5-nCoV vaccine in trials.

Economics, Workforce, Supply Chain, PPE: Decontaminate N95 respirators using a microwave.

Epidemiology Highlights: Mask-wearing prevents transmission. Face-masks associated with Italy's declining epidemic.

Healthcare Policy Recommendations: Social distancing reassessed? Lessons learned from previous pandemics. Digital tools against COVID-19. Investigating cultural and psychological factors to reduce spread.

Practice Guidelines: Preserving couple relationships during COVID-19.

Testing: No difference in viral load between symptomatic and asymptomatic individuals. A new fast point-of-care virus detection test. Few patient serum samples have virus RNA (at low viral load) and these are not associated with infectious disease. Symptoms and temperature reports are informative to screen health care workers.

Drugs, Vaccines, Therapies, Clinical Trials: 37 new trials registered June 29-30.

Other Science: Multisystem pediatric inflammatory syndrome. Hazardous postoperative outcomes. Childhood immunization in Africa. Citizen science and protein folding.

With this 58th edition of our briefing, we bring to a close our efforts to provide out distillation of current medical literature, local, national, and international news on COVID-19 to inform on healthcare and governmental response to the pandemic. We would like to express our profound gratitude to the many contributors to our Briefing over the past three months, and have created a tribute to them at the following page: https://digitalrepository.unm.edu/hsc_covid19_briefings/58/***. A big thank you for all of the support we have received from our many readers!***

All of our past briefings are maintained in a UNM library repository here.
Our continuously curated practice guidelines in the context of COVID-19 can be found here.
Our continuously curated therapeutic evidence is maintained here.

NM Highlights

- NM reports 4 more COVID-19 deaths and 168 additional cases on June 30

  As of today (6/30), the total positive cases and total deaths in the state are 12,147 and 497, respectively. The state has performed 344,181 tests, there are 127 individuals currently hospitalized for COVID-19, and 5,393 COVID-19 cases have recovered. NMDOH portal featuring epidemiologic breakdown of cases.

- ABQ nursing home 'Princeton Place' hit hard with COVID

  KOAT: 14 employees and 23 residents at Princeton Place have tested positive for COVID-19. Princeton Place has more than 300 beds in the facility, located near the state fairgrounds.

- UNM student family housing to close permanently, citing high renovation cost

  Daily Lobo: UNM Residence Life and Student Housing sent out an email on 6/29 announcing the closing of the housing complex. Renovation costs to repair the housing facility was projected to be upward of $45 million. Concern has been raised about where international students, who make up a substantial part of the student family housing community, will live amidst current travel restrictions.

- White Sands National Park partially reopen

  KRQE: White Sands National Park has partially reopened as part of the phased reopening of state parks and lakes. Park rangers are asking that visitors park only in designated areas, pack out everything you bring in, maintain 6 ft (2 m) social distance from others, stay on marked trails, and be prepared for limited access to restrooms and other facilities.

- Most of New Mexico COVID-19 relief dollars going to help tribal communities

  KOAT: According to federal records, more than $40 million has been spent in the Land of Enchantment and $21 million (52.5%) of that has gone to the Indian Health Services or the Bureau of Indian Affairs.

- New Mexico governor signs bill to help financial strain

  KOB: For New Mexicans unable to pay their taxes on time, the bill temporarily waives interest and penalties on late payments. The bill will also boost temporary state payments to cities hit hard by the economic downturn. New payment deadlines have been set for April 2021.

US Highlights

- Polarization of the political elite's response to the COVID-19: analysis of Twitter accounts

  Science Advances: To systematically monitor the polarization of the political elite's response to the COVID-19 pandemic, the authors analyzed Twitter accounts of members of the 116th United States Congress. Members of Congress quickly polarized along party lines in their communications regarding the crisis. Democrats tended to discuss the issue earlier and with more frequency. From January 17 through March 31, Democrats sent 19,803 tweets about COVID-19 while Republican members issued only 11,084, or 71 tweets per Democratic to 45 tweets per Republican member. The difference in cumulative tweets between Democratic and Republicans politicians became more pronounced after the CDC identified the first case of community spread in California and this gulf continued to increase following the declaration of a national emergency. The words most frequently used by Democrats concern public health and direct aid to workers (e.g., health, leave, testing) while the words most frequently used by Republicans concern national unity, China, and business (e.g., together, United States, China, businesses). The video about this research is available here.

International Highlights

- China's military approves coronavirus vaccine for use on soldiers

  Reuters: The Chinese military has received the green light to use a coronavirus vaccine developed by its research unit and a biotech company, according to a report. The Central Military Commission approved the use of the Ad5-nCoV vaccine candidate on Thursday for a period of one year, CanSino Biologics said in a filing. It was developed jointly by CanSino and the Beijing Institute of Biotechnology at the Academy of Military Medical Sciences. The company said clinical trials in 108

participants proved the vaccine was safe and showed some efficacy. The Ad5-nCoV is one of China's eight COVID-19 vaccine candidates approved for human trials at home and abroad. It also won approval for human testing in Canada. CanSino declined to disclose to Reuters whether the inoculation is mandatory or optional, citing commercial secrets. No vaccine has been approved for commercial use against the coronavirus.

Economics, Workforce, Supply Chain, PPE Highlights

- Microwave-generated steam decontamination of N95 respirators

  Clinical Science and Epidemiology: The paper describes a microwave-generated steam decontamination protocol for N95 respirators for use in health care systems. Using widely available glass containers, mesh from commercial produce bags, a rubber band, and a 1,100-W commercially available microwave, the authors constructed an effective, standardized, and reproducible means of decontaminating N95 respirators. Employing this methodology against MS2 phage, a highly conservative surrogate for SARS-CoV-2 contamination, they report an average 6-log10 plaque-forming unit (PFU) (99.9999%) and a minimum 5-log10 PFU (99.999%) reduction after a single 3-min microwave treatment. Notably, quantified respirator fit and function were preserved, even after 20 sequential cycles of microwave steam decontamination.

Epidemiology Highlights

- Mask wearing in pre-symptomatic patients prevents transmission

  Travel Medicine & Infectious Disease: 127 patients were confirmed to be infected with the SARS-CoV-2 in China. Epidemiological trajectory and clinical features of these COVID-19 cases were retrospectively retrieved from electronic medical records and valid individual questionnaire. The data showed that incidence of COVID-19 was significantly higher for local residents who had close-contact with pre-symptomatic patients who returned from Wuhan and did not wear masks compared to those who had close contact pre-symptomatic patients who returned from Wuhan but did wear masks (19.0% vs. 8.1%, $p<0.001$). Among 57 close-contact individuals, 21 sequential local COVID-19 patients originated from a pre-symptomatic Wuhan returned couple, indicating that dense gathering in congested spaces is a high risk for SARS-CoV-2 transmission.

- Face mask use correlated with accelerated curtailing of the epidemic in Italy

  MedRXiv preprint: A SIQR (susceptible, infectious, quarantine, recovery) infectious disease model was used to examine the effects of legal interventions and behavior change on cumulative number of COVID-19 cases in Italy. The major lockdowns were effective in halting spread of disease. However, there was another decrease that did not correspond to the obvious drastic legal interventions but may be explained by widespread promotion and mandatory use of face masks. Widespread use of face masks and other protective means has contributed substantially to keeping the number of new Italian COVID-19 cases under control in spite of society turning towards a new normality.

Healthcare Policy Recommendations

- Is one- or two-meters social distancing enough for COVID-19? (Letter to the Editor)

  Royal Society for Public Health: Evidence for reassessing. A short review is provided by China and US researchers. WHO recommends people keep at least 1 m (3 feet) apart. Based on the fact that a safe social distance is influenced by a variety of factors, a previous study has found that 1.83 m is the minimum requirement for preventing of contracting SARS-CoV-2. The wind speed in open space could significantly affect the travel distance of airborne disease-carrying droplets. When wind speed increases from 4 km/h to 15 km/h, the saliva droplet can travel up to 6 m with a corresponding decrease of its concentrations and liquid droplet size. Based on the existing study results, small particles with viral content may cover a distance of up to 10 m in an indoor environment,1,5 which could increase the risk of SARS-CoV-2 transmission in the workplace.

- Preventing COVID-19 and its sequela

  American Journal of Preventative Medicine: A review on COVID-19 prevention strategies and policies accounting for lessons learned from previous pandemics.

- Digital tools against COVID-19: taxonomy, ethical challenges, and navigation aid

  Lancet: The authors seek to contribute to the rapidly evolving debate about the promises and risks of digital public health technologies in response to COVID-19, focusing on public health outcomes and ethical principles guiding those outcomes by offering a topology of the main digital public health tools. This is a navigation aid for policy makers, recommending steps that should be taken to mitigate risks by engaging in a robust risk-benefit analysis.

- Cultural orientation, power, belief in conspiracy theories, and intentions to reduce spread of COVID-19

  British Journal of Social Psychology: The study investigated cultural and psychological factors associated with intentions to reduce the spread of COVID-19. Participants (n = 704) completed measures of individualism-collectivism, belief in conspiracy theories about COVID-19, feelings of powerlessness, and intentions to engage in behaviors that reduce the spread of COVID-19. Results revealed that vertical individualism negatively predicted intentions to engage in social distancing, directly and indirectly through both belief in COVID-19 conspiracy theories and feelings of powerlessness. Vertical collectivism positively predicted social distancing intentions directly. Horizontal collectivism positively predicted social distancing intentions indirectly through feelings of powerlessness. Finally, horizontal collectivism positively predicted hygiene-related intentions both directly and indirectly through lower feelings of powerlessness. These findings suggest that promoting collectivism may be a way to increase engagement with efforts to reduce the spread of COVID-19. They also highlight the importance of examining the interplay between culture and both personal feelings (powerlessness) and information consumption (conspiracy theories) during times of crisis.

Practice Guidelines

- Helping couples to preserve relationships during COVID-19 pandemic

  Family Process: The authors focus on strategies that therapists and relationship educators can use to help couples preserve and protect their relationships. They describe 4 foundations of safety that allow relationships to thrive: physical, emotional, commitment, and community. 3 keys from their body of work are highlighted that can help guide individuals and couples in protecting their relationships on a day-to-day, moment-to-moment basis: 1) Decide, don't slide. 2) Make it safe to connect. 3) Do your part.

Testing

- No difference in viral load between symptomatic and asymptomatic individuals

  Nature: The authors collected information on the demographics, clinical presentation, hospitalization, contact network and presence of SARS-CoV-2 infection in nasopharyngeal swabs for 85.9% and 71.5% of the population of one town in Italy at two time points. The mean serial interval was 7.2 days. On the first survey at the time the town lockdown started, a prevalence of infection was 2.6%, on the second survey at the end of the lockdown, a prevalence was 1.2%. 42.5% of the confirmed SARS-CoV-2 infections detected across the two surveys were asymptomatic. There was no statistically significant difference in the viral load of symptomatic versus asymptomatic infections. Mathematical modelling and genetic testing were also employed.

- First handheld point-of-care system for rapid virus detection in under 20 minutes

  MedRxiv preprint: A rapid point-of-care (PoC) diagnostic test (< 20 min) is described which is based on reverse transcriptase loop-mediated isothermal amplification (RT-LAMP) and semiconductor technology for virus detection from extracted RNA samples. It was validated against 183 clinical samples including 127 positive samples. Results showed 90.55% sensitivity and 100% specificity when compared to RT-qPCR and average positive detection times of 15.45 ± 4.43 min. Paired with a smartphone for results visualization and geo-localization, this portable diagnostic platform with secure cloud connectivity will enable real-time case identification and epidemiological surveillance.

- Few patient serum samples have vRNA (low loads) and are not associated with infectious SARS-CoV-2

  Nature Reviews Immunology preprint: A systematic literature review was done to assimilate the evidence for the frequency of vRNA in blood, and to identify associated clinical characteristics. The authors also performed RT-PCR in serum samples from a UK cohort of 212 acute and convalescent COVID-19 cases, together with 111 additional convalescent plasma samples. To determine whether PCR-positive blood samples could pose an infection risk, they attempted virus isolation from a subset

of RNA-positive samples. The review identified 28 relevant studies, reporting SARS-CoV-2 RNA in 0-76% of blood samples; pooled estimate 10% (95%CI 5-18%). Among the collected serum samples only 12.7% had SARS-CoV-2 RNA detected by RT-PCR. RNA detection occurred in samples up to day 20 post symptom onset, and was associated with more severe disease. Across all samples collected ≥28 days post symptom onset, 0% had vRNA detected. Among PCR-positive samples, cycle threshold (ct) values were high (range 33.5-44.8), suggesting low vRNA copy numbers. PCR-positive sera inoculated into cell culture did not produce any cytopathic effect or yield an increase in detectable SARS-CoV-2 RNA. Thus, vRNA was detectable at low viral loads in a minority of serum samples collected in acute infection, but was not associated with infectious SARS-CoV-2.

- Symptom and temperature reports are useful screening tools for healthcare workers

  PLOSone: In this retrospective study of health care workers (HCW) undergoing both COVID-19 telephonic symptom screening and nasopharyngeal SARS-CoV-2 assays, HCWs with negative assays but progressive symptoms were re-tested for SARS-CoV-2. Among 592 HCWs tested, 14% had an initial positive SARS-CoV-2 assay. 97% of HCW who were asymptomatic or reported only sore throat/nasal congestion had negative SARS-CoV-2 assays (P = 0.006). HCWs reporting three or more symptoms had an increased multivariate-adjusted odds of having positive assays, 1.95, which increased to 2.61 for >=6 symptoms. The multivariate-adjusted odds of a positive assay were also increased for HCWs reporting fever and temperature >/= 37.5C, and those with myalgias (1.83). Loss of smell/taste was reported less frequently (16%) than other symptoms by HCWs with positive assays, but was associated with more than a 7-fold multivariate-adjusted odds of a positive test. Of 509 HCWs with initial negative assays, 9 had symptom progression and positive re-tests, yielding an estimated negative predictive value of 98.2% (95% CI: 96.8-99.0%) for the exclusion of clinically relevant COVID-19.

Drugs, Vaccines, Therapies, Clinical Trials

- 37 New COVID-19 Trials registered June 29-30 at clinicaltrials.gov

  Treatment trials: Olokizumab, C21, Povidone-iodine, BDB-001 Injection, Prednisone, Hesperidin and Diosmin mixture, NA-831 and Atazanavir/Dexamethasone, REGN10933+REGN10987, Steroids and cyclosporin-A, VentaProst. At time of writing, a total of 2180 were active, 187 completed, and 4 posted results.

Other Science

- Multisystem Inflammatory Syndrome in U.S. children and adolescents

  NEJM: Targeted surveillance for Multisystem Inflammatory Syndrome (MIS-C) was conducted in pediatric health centers across the United States. The case definition included six criteria: serious illness leading to hospitalization, an age of less than 21 years, fever that lasted for at least 24 hours, laboratory evidence of inflammation, multisystem organ involvement, and evidence of infection with SARS-CoV-2 based on reverse-transcriptase polymerase chain reaction (RT-PCR), antibody testing, or exposure in the past month. The authors report on 186 patients with MIS-C in 26 states. 73% of them had previously been healthy, 70% were positive for SARS-CoV-2 and 88% were hospitalized after April 16, 2020. Organ-system involvement included the gastrointestinal system in 171 patients (92%), cardiovascular in 149 (80%), hematologic in 142 (76%), mucocutaneous in 137 (74%), and respiratory in 131 (70%). The median duration of hospitalization was 7 days (interquartile range, 4 to 10); 148 patients (80%) received intensive care, 37 (20%) received mechanical ventilation, 90 (48%) received vasoactive support, and 4 (2%) died. Coronary-artery aneurysms (z scores ≥2.5) were documented in 15 patients (8%), and Kawasaki's disease–like features were documented in 74 (40%). Most patients (171 [92%]) had elevations in at least four biomarkers indicating inflammation. The use of immunomodulating therapies was common: intravenous immune globulin was used in 144 (77%), glucocorticoids in 91 (49%), and interleukin-6 or 1RA inhibitors in 38 (20%).

- Hazardous postoperative outcomes of unexpected COVID-19 infected patients

  World Journal of Surgery: This report is a review on the perioperative period in COVID-19 patients who were preoperatively asymptomatic and not tested for COVID-19. Four reports were identified through the literature search, comprising 64 COVID-19 carriers, of them 51 were diagnosed only in the postoperative period. Synthesis of these reports, concerning the postoperative outcomes of patients diagnosed with COVID-19 during the perioperative period, suggested a 14/51 (27.5%) postoperative mortality rate and severe mostly pulmonic complications, as well as medical staff exposure and transmission.

- Childhood immunization in Africa: systems thinking and implementation science

  International Journal of Infectious Diseases: The authors propose a paradigm shift towards systems thinking and use of implementation science in immunization decision making. Systems thinking can inform a more nuanced and holistic understanding of the interrelationship that between COVID-19, its control strategies and childhood immunization. Tools like causal loop diagrams can be used to explicitly illustrate the systems structure by identifying the feedback loops. Once mapped and leverage points for interventions have been identified, implementation science can be used to guide the rapid uptake and utilization of multifaceted evidence-based innovations in complex practice settings. As Africa re-strategize for the post-2020 era, these emerging fields can contribute significantly in accelerating progress towards universal access to vaccines for all children on the continent despite COVID-19.

- Citizen scientists pool computing resources to accelerate COVID-19 protein investigation

  BioRiv preprint: Over a million citizen scientists have banded together through the Folding@home distributed computing project to create the world's first Exascale computer and simulate protein dynamics. These participants donated their computing power, allowing it to be pooled in order to reveal protein folding properties of COVID-19 proteins much faster than otherwise possible. The structures and mechanistic insights revealed through this project present new targets for the design of therapeutics. The data are supported by a variety of experimental observations and are being made publicly available in accordance with open science principles to accelerate the discovery of new therapeutics.

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