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### 2020-05-08 DAILY UNM GLOBAL HEALTH COVID-19 BRIEFING

Christophe G. Lambert

Shawn Stoicu

Ingrid Hendrix

Lori Sloane

Anastasiya Nestsiarovich

*See next page for additional authors*

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**Authors**

Christophe G. Lambert, Shawn Stoicu, Ingrid Hendrix, Lori Sloane, Anastasiya Nestsiarovich, Praveen Kumar, Nicolas Lauve, Ryen Ormesher, Lauren Tagliaferro Epler, Jenny Situ, Aly Raboff, John Powell, Alexandra Yingling, Cristian Bologa, Tudor I. Oprea, Gregory Mertz, and Douglas J. Perkins

## DAILY UNM GLOBAL HEALTH COVID-19 BRIEFING

May 8, 2020

### Executive Summary

UNM drug repurposing. NM cases. Doctors Without Borders. SNAP benefits online. NM 7<sup>th</sup> highest unemployment. Virtual LemonAid tonight. New N98 masks. Healthcare supply chain challenge. EMS lack resources. Infection risk in healthcare workers. COVID-19 on medical education. Human disinfectant chambers. Evidence of seroconversion. Dangers of considering herd immunity. Wastewater-based surveillance. More youths infected. Reconstructing ship spread. Pharmacoepidemiologic analysis. Clinicopathologic characteristics. Cancer treatment impact. Reduced voluntary psychiatric admission in Italy. Operating room management. Humidifiers reduce transmission. Phone contact tracing ethics. Call for patient database. Immunity certification program. Guidelines on tracheostomy, IBD, nose bleeding, pituitary tumors, and hematopoietic stem cells transplantation, benefits of low-PEEP, and of molecular diagnostics. FDA authorizes at-home test. Cepheid Xpert test. MRSA nasal swabs. NIH remdesivir+baricitinib RCT. Corticosteroid caution. Arbidol active in vitro. ACE/ARB systematic review. In silico phytochemical and virus protease candidates. Potential zinc benefit. 31 new clinical trials. Glycemic control benefit. Psychological effects meta-analysis and survey. Disease course model. Liver injury. Environmental and health perspectives. Olfactory and gustatory dysfunction. Vitamin D. Disease map.

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](#).

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

### NM Highlights

- [UNM Scientists studying ways to repurpose older drugs](#)  
Scientists at the university of New Mexico are using machine learning to analyze the university's DrugCentral database to identify drugs that could be repurposed as treatments for the COVID-19 infection. The drugs, many of which were developed decades ago for very different health conditions, could be a game-changer at a time when there are no vaccines or broadly effective drug treatments for the disease.
- [New Mexico reports 9 more COVID-19 deaths and 181 additional cases on May 8](#)  
The total positive cases and total deaths in the state are 4,673 and 181, respectively. As of today (5/8), the state has performed 93,262 tests, there are 201 individuals currently hospitalized for COVID-19, and 1189 COVID-19 cases have recovered. [New NMDOH portal featuring epidemiologic breakdown of cases](#).
- [Doctors Without Borders team comes to NM to aid tribes](#)  
Doctors Without Borders, an international medical humanitarian organization, announced that a nine-person team of physicians, nurse-midwives, logisticians, and a health promoter is now working in New Mexico and the Navajo Nation, and is assessing how they can provide support to pueblos across the state. The NM DOH reports that 56% of COVID-19 cases in the state are Native American.

- [USDA allows New Mexicans to use SNAP benefits online](#)

The USDA approved New Mexico to let families on Supplemental Nutrition Assistance Program (SNAP) benefits buy food from online retailers, such as Walmart and Amazon, in response to the pandemic. Karmela Martinez, the NM Income Support Division Director, says she hopes to see the program continue in New Mexico after the pandemic ends.

- [NM is 7th highest in unemployment claims over the past week](#)

Since March 16th, 33.5 million Americans have lost their employment. Not all states have been impacted equally, with New Mexico having the 7th highest increase in unemployment claims over the past week. There were 16,801 unemployment claims the week of April 27th, 2020, a 2,324% increase from April 2019. NM is currently 26th highest in unemployment claims since the start of the COVID-19 pandemic.

- [Virtual LemonAid digital arts livestream tonight at 8pm to support NM COVID-19 relief](#)

Virtual LemonAid is a major multidisciplinary digital arts festival leveraging the creative talent of our region to raise critical funds to provide aid and support to those most in need in our community during the COVID-19 crisis. The broadcast will be available on: [Youtube Live](#), [Facebook Live](#), [Instagram Live](#), Santa Fe Community Television - SFCTV- Channel 16 (Comcast).

## Economics, Workforce, Supply Chain, PPE Highlights

- [New multilayer nanofiber filter for simulated airborne COVID-19](#)

A goal of the study was to develop air filters (e.g. respirator, facemask, ventilator, medical breathing filter/system) with 90% capture of 100-nm airborne COVID-19 with pressure drop of less than 30 Pa (3.1 mm water). The 6-layer charged nanofiber filter was developed and qualified as an 'N98 respirator' (98% capture efficiency for 300-nm NaCl aerosols) but with pressure drop below conventional N95. The 6-layer charged PVDF nanofiber filter provides good personal protection against airborne COVID-19 virus and nano-aerosols from pollution based on the N98 standard and is 10X more breathable than N95 respirator.

- [Healthcare supply chains: COVID-19 challenges and pressing actions](#)

Healthcare requires 5 categories of products: pharmaceuticals, personal protective equipment, medical devices, medical supplies, and blood. Each of these categories has a distinct supply chain, and the failure of any 1 of these chains can wreak havoc on the health care system. Authors suggest that urgent action must be taken to ensure that our supply chains support our health care providers at this critical time and in the future.

- [A survey on EMS resource capacity and competency](#)

An online survey was randomly distributed between April 1, 2020, and April 16, 2020 to various active Emergency Medical Services (EMS) paid personnel in all 50 U.S. states (n=192). An overwhelming number of EMS providers report having limited access to N95 respirators, receiving little or no benefits from COVID-19 related work, and report no institutional policy on social distancing practices despite CDC recommendations. For providers who do have access to N95 respirators, 31% report having to use the same mask for 1 week or longer. Approximately 1/3 of the surveyed participants were unsure of when a COVID-19 patient is infectious. The data suggests regular decontamination of EMS equipment after each patient contact is not a regular practice.

- [Epidemiology, PPE, and risk factors for infection in healthcare workers](#)

A living rapid review regarding SARS-CoV-1 and SARS-CoV-2 finds that healthcare workers generally experience a high incidence of infection although apparently less severe illness and mortality than non-healthcare workers. PPE use was generally associated with dose-dependent decreased risk. Although masks showed the most consistent association, risk reduction was observed for gloves, gowns, eye protection, handwashing, and training in infection control measures. It found evidence that N95 masks may be superior to surgical masks. Increased infection risk was observed with involvement in intubations, and direct contact with infected patients or their bodily secretions.

- [The impact of COVID-19 on medical education](#)

*Cureus* Editorial: The replacement of in-person with online classes, the cancellation of clerkships, and the loss of conference presentations present a challenge for medical students trying to distinguish themselves on residency applications. Small

group learning, sharing best practices, and implementing webinar technology are ways to combat this.

- [SARS-CoV-2 human disinfection chambers: a critical analysis](#)

Rapid human disinfection chambers have emerged as an innovation for the pandemic. They have an entry point, an exit point, an enclosed chamber where the disinfection takes place, power supply, solvent supply, chemical chamber/mixer, air supply and compressor, as well as a spray mechanism. The paper examines the viricidal activity of various agents, along with safety/toxicity considerations for repeated human exposure. Researchers concluded that though limited exposure to a chemical may not show harm, that does not mean the chemical or compound is safe.

## Epidemiology Highlights

- [Most people carry antibodies after recovering](#)

*MedRxiv* preprint: Seroconversion and PCR-positivity was investigated in 1343 convalescent serum donors in New York City. All but three confirmed SARS-CoV-2 patients seroconverted to the SARS-CoV-2 spike, while only 37.4% of suspected SARS-CoV-2 patients seroconverted. Nasopharyngeal SARS-CoV-2 RNA was detected up to 28 days from symptom resolution. The vast majority of confirmed COVID-19 patients seroconvert, potentially providing immunity to reinfection. They also report that in a large proportion of individuals, viral genome can be detected via PCR in the upper respiratory tract for weeks post symptom resolution, but it is unclear if this signal represents infectious virus. Story also covered in [New York Times](#).

- [Herd Immunity against COVID-19: A dangerous misconception](#)

Two infectious disease epidemiologists clearly state that herd immunity against COVID-19 will not be achieved at a population level in 2020, barring a public health catastrophe. In New York City, initial studies suggest that perhaps 15-21% of people have been exposed so far, with more than 17,500 dead. "To reach herd immunity for COVID-19, likely 70% or more of the population would need to be immune. Without a vaccine, over 200 million Americans would have to get infected before we reach this threshold." This will not occur before mid-2021; at the current daily death rates, up to half a million Americans could die of COVID-19 by that time.

- [Computational analysis of COVID-19 surveillance by wastewater-based epidemiology](#)

Scientists are turning now to wastewater-based epidemiology (WBE) as a tool for assessing and managing the pandemic. The authors employed computational analysis and modeling to examine the feasibility, economy, opportunities and challenges of enumerating active coronavirus infections locally and globally using WBE. Depending on local conditions, detection in community wastewater of one symptomatic/asymptomatic infected case per 100 to 2,000,000 non-infected people is theoretically feasible. WBE surveillance of populations is shown to be orders of magnitude cheaper and faster than clinical screening yet cannot fully replace it. Cost savings worldwide for one-time national surveillance campaigns are estimated to be in the million to billion US dollar range (US\$), depending on a nation's population size and number of testing rounds conducted. For resource poor regions and nations, WBE may represent the only viable means of effective surveillance. Important limitations of WBE rest with its inability to identify individuals and to pinpoint their specific locations.

- [Rising proportion of youth among COVID-19 cases following the physical distancing](#)

Using data on COVID-19 cases in Germany from the Robert Koch Institute, the authors found a relative increase with time in the prevalence in 15 to 34-year-olds (particularly 20-24-year-olds) compared with 35-49- and 10-14-year-olds (we excluded older and younger ages because of different healthcare seeking behavior). This suggests an elevated role for that age group in propagating the epidemic following the introduction of physical distancing measures.

- [Computational methods reconstructing COVID-19 spread on the "Diamond Princess" ship](#)

A contact network was used to reconstruct unprotected, protected contact, and airborne spread to simulate the two-stages outbreak of COVID-19 on the "Diamond Princess" cruise ship. During the early epidemic with intensive social contacts, the results reveal that the average transmissibility ( $t$ ) was 0.026 and the basic reproductive number  $R_0$  was 6.94, triple that in the WHO report, indicating that all people would be infected in one month. The  $t$  and  $R_0$  decreased to 0.0007 and 0.2 when quarantine was implemented. The reconstruction suggests that diluting the airborne virus concentration in closed settings is useful in addition to isolation, and high-risk susceptible should follow rigorous prevention measures in case exposed.

- [Considerations for pharmacoepidemiological analyses in COVID-19](#)

In this paper, endorsed by the International Society for Pharmacoepidemiology, methodological considerations are provided for the conduct of pharmacoepidemiologic studies in relation to the pandemic across eight domains: (1) timeliness of evidence, including the need to prioritize some questions over others in the acute phase of the pandemic; (2) the need to align observational and interventional research on efficacy; (3) the specific challenges related to 'real-time epidemiology' during an ongoing pandemic; (4) what design to use to answer a specific question; (5) considerations on the definition of exposures; (6) what covariates to collect; (7) considerations on the definition of outcomes; and (8) the need for transparent reporting.

- [Characteristics of 8697 patients with COVID-19 in China: a meta-analysis](#)

Meta-analysis showed that a higher proportion of infected patients were male (53.3%), and the two major symptoms observed were fever (78.4%) and cough (58.3%). Other common symptoms included fatigue (34%), myalgia (21.9%), expectoration (23.7%), anorexia (22.9%), chest tightness (22.9%) and dyspnea (20.6%). Only 5.4% of the patients were asymptomatic. Most patients showed normal leucocyte counts (64.7%) and elevated C reactive protein levels (65.9%). Lymphopenia was observed in about 47.6% of the infected patients, along with abnormal levels of myocardial enzymes (49.4%) and liver function (26.4%). Other findings included leucopenia (23.5%), elevated D-dimer (20.4%), elevated erythrocyte sedimentation rate (20.4%), leukocytosis (9.9%), elevated procalcitonin (16.7%) and abnormal renal function (10.9%).

- [Impact of COVID-19 on cancer patients in NYC center](#)

The New York Proton Center (NYPC) is a high-volume free-standing multi-institutional proton center. The purpose of this report is to describe the institutional patient experience and quantify the impact of treatment delays and interruptions over the first month of the COVID-19 outbreak. Despite the early implementation of measures and policies, NYPC still had 11% of patients affected, including 3% confirmed positive for COVID-19 within the first month and one patient death. All the delays at NYPC occurred in the second half of the month, suggesting other cities should expect and prepare for an acceleration of patient events near their projected regional pandemic peak.

- [Reduced voluntary psychiatric admissions in Italy after pandemic start](#)

In the 40-day period (February 21st-March 31st 2020) after the start of the COVID-19 epidemic in Italy, compared to a similar 40-day period prior to 21 February, and compared to two 40-day periods of 2019, there has been a marked reduction in psychiatric admission rates. The reduction was explained by voluntary admissions, while there was not a noticeable reduction for involuntary admissions. The reduction was visible for all diagnostic groups, except for a group of 'Other' diagnoses, which includes anxiety disorders, neurocognitive disorders, etc.

## Healthcare Policy Recommendations

- [Strategies for daily ambulatory operating room management after acute phase of COVID-19](#)

The article suggests dedicating most operating rooms to procedures that are not airway aerosol producing and can be performed without general anesthesia. Other suggestions are to increase throughput by performing nerve blocks before patients enter the operating rooms, bypass the phase I post-anesthesia care unit whenever possible by appropriate choices of anesthetic approach and drugs, and plan long-duration workdays (e.g., 12-h). The authors recommend using statistical methods to plan for the resulting long turnover times. Whenever possible, have the anesthesia and nursing teams stagger cases in more than one room so that they are doing one surgical case while the other room is being cleaned.

- [Humidifiers to reduce viral transmission](#)

According to recent studies, COVID-19 transmission is more efficient in dry, cold climates. Further, when the respiratory mucosal barrier is dehydrated, it loses structural integrity, promoting viral transmission. The authors suggest aggressive re-humidification of dry air in all public and private heated spaces, especially in areas containing patients on ventilators.

- [Ethical implications of using phone apps for contact tracing](#)

Contact tracing is an essential practice to combat the spread of infection. COVID-19 is especially complicated, as a high proportion of infection is spread pre-symptomatically. To combat this, phone apps offer a more instantaneous means to perform contact tracing. However, using a phone app for 'intelligent physical distancing' raises many ethical concerns, such

as individuals unable to maintain data security and privacy.

- [Researchers call for COVID-19 patient health record database](#)

*Lancet*: Currently, there is no pooled, publicly-available dataset on COVID-19 patients. The authors make the argument that access to this data would greatly benefit researchers and could expedite global efforts to combat the virus. It is noted that the absence of this database is not due to absence of technology or precedent, as there is a database established in 1996 that provides researchers with deidentified health record data on intensive care patients.

- [Consideration of a COVID-19 immunity certification program](#)

*JAMA Viewpoint* examines the U.S. government's consideration of an immunity certification program based on past COVID-19 infection or positive antibody testing. Individuals with such certification could be allowed certain work and social freedoms, such as attending events with large groups. The article highlights temporary inequities in civil liberties that could come with such a program, advocates focusing on healthcare workers when supplies are limited, and ensuring equal access to testing thereafter. As COVID-19 is not yet vaccine-preventable and there is not yet universal availability of antibody testing, developing such a program would require more time and consideration.

## Practice Guidelines

- [Guidelines for tracheostomy: American Association for the Surgery of Trauma](#)

The guidelines from the Critical Care and Acute Care Surgery Committees of the American Association for the Surgery of Trauma are provided on tracheostomy in known or suspected Covid-19 patients.

- [Guidelines on management of IBD patients during the COVID-19 pandemic](#)

Here, the World Endoscopy Organisation (WEO) is providing practical advice for the management of inflammatory bowel disease (IBD) patients during the pandemic covering the diagnostic and therapeutic aspects.

- [Recommendations for nose bleeding management during the COVID-19 pandemic](#)

Recommendations include: thorough history taking, wearing PPE, performing invasive treatments in operating room or well demarcated areas, and postponing sphenopalatine artery ligation (for posterior epistaxis) until COVID-19 testing has been performed. The use of local anesthetic atomized sprays should be avoided, and soaked pledgets should be preferred. A suction system should be used during the procedure within a closed system with a viral filter.

- [Management of pituitary tumors during COVID-19](#)

Recommendations are provided by a group of international researchers. Face to face visits for patients with pituitary tumors could be postponed in most cases for 3-6 months without compromising optimal care. Endocrine help-line run by endocrinologists and endocrine nurses should be available 24/7 aiming to offer immediate support to patients with urgent problems/queries, to reduce anxiety and to reduce workload of primary care clinicians. Dissemination of websites of patient support groups is strongly recommended.

- [International guidelines for hematopoietic stem cell transplantation](#)

The guidelines were issued by the European Society for Blood and Marrow Transplantation (EBMT) and American Society for Transplantation and Cellular Therapy (ASTCT). They include a negative COVID-19 PCR test prior to transplant as well as completing 14 days of isolation before starting transplant conditioning. Donors who test positive for COVID-19, who are symptomatic, or who have traveled to high risk areas should defer to donate unless the case is urgent and there are no alternative donors. As of March 20,2020, 15 cases of COVID-19 cases in post-hematopoietic stem cell transplantation setting (15 allogenic and 3 autologous) have been reported from Europe with one death.

- [Care map and low PEEP reduce ventilation days, ICU admission, mortality and LOS](#)

In a retrospective analysis of clinical data on patients with COVID-19 pneumonia and ARSD admitted to ICU an increased survival was observed in patients with low positive end-expiratory pressure (PEEP) compared to other groups. A possible explanation could be that the relative low-pressure ventilation avoids transforming an initial alveolitis into an ARDS-iatrogenic framework, in which the local ongoing inflammation is rather damaged than helped by high PEEP (generating a Ventilation-Induced-Lung Injury - VILI) in a context that is the "not-classic" ARDS. The authors also recommend their multimodal program

("care map") which implements Early Warning Score (EWS) monitoring for intermediate care patients, in order to perform a strict selection of ICU admission and employ mechanical ventilation as little as necessary. This program allowed to reduce the number of ICU admissions, the number of ventilation days and mortality.

- [Molecular testing for acute respiratory tract infections: recommendations](#)

The Diagnostics Committee of the Infectious Diseases Society of America (IDSA) conducted a literature review. Compared to classical culture-and antigen-based methods, molecular tests have high sensitivity and there is potential for a clinically meaningful turn-around-time to actionable results. Respiratory NAAT is most useful in the setting of intermediate pre-test probability and intermediate disease severity. This is a situation where a negative test may permit withholding of initial empiric coverage of a potential pathogen, whereas a positive test can allow therapy to be focused against a particular pathogen, thus increasing therapeutic efficacy, decreasing avoidable drug-toxicity, and potentially reducing unnecessary additional testing.

## Testing

- [FDA authorizes first at-home saliva test](#)

The RUCDR Infinite Biologics test will cost \$150 and needs to be fully supervised by a practitioner via telemedicine to ensure proper sample collection. Test analysis will be performed at Rutgers Clinical Genomics Laboratory and results will be available within 48-72 hours.

- [New Cepheid Xpert Xpress automated molecular test shown to be rapid, sensitive, and accurate](#)

The limit of detection of the 45-minute Xpert test was 0.01 plaque forming units (PFU)/mL. Other hCoVs were not detected by the Xpert test. SARS-CoV was detected by a broad-range target (E) and was distinguished from SARS-CoV-2 (SARS-CoV-2-specific N2 target). Compared to nucleic acid amplification tests (NAAT), the positive agreement of the Xpert test was 219/220 (99.5%) and the negative agreement was 250/261 (95.8%). A third tiebreaker NAAT resolved all but three of the discordant results in favor the Xpert test.

- [MRSA nasal swabs can be used to detect SARS-CoV-2](#)

MRSA nasal swabs showed a high concordance with respiratory viral swabs. In situations where respiratory viral swabs are in scarce supply, health care workers can use MRSA nasal swabs with similar virus detection accuracy.

## Drugs, Vaccines, Therapies, Clinical Trials

- [NIH announces trial combining antiviral remdesivir and antiinflammatory drug baricitinib](#)

The NIAID-sponsored trial is expected to open at approximately 100 U.S. and international sites and enroll more than 1000 participants. Baricitinib, taken orally, inhibits cytokine signaling in the body that plays a role in causing inflammatory responses. The putative benefit of baricitinib for COVID-19 has been described in a case series of critically ill patients who recovered. The combination of remdesivir and baricitinib has not been evaluated in a large, randomized controlled treatment trial. One arm will receive baricitinib tablets orally and intravenous (IV) remdesivir, and the other will receive placebo tablets orally and IV remdesivir in this double-blind study. The primary outcome is time to recovery, with secondary outcomes examining severity and mortality.

- [Corticosteroids and SARS-CoV-2/SARS-CoV/MERS-CoV outcomes: a meta-analysis advises caution](#)

Corticosteroid use was associated with delayed virus clearing with a mean difference (MD) = 3.78 days (95% confidence Interval [CI] = 1.16, 6.41 days; I(2) = 0%). There was no significant reduction in deaths with relative Risk Ratio (RR) = 1.07 (90% CI = 0.81; 1.42; I(2) = 80%). Hospitalization duration was prolonged and use of mechanical ventilation increased.

- [The anti-influenza virus drug, arbidol is an efficient inhibitor of SARS-CoV-2 in vitro](#)

The authors evaluated six currently available and licensed anti-influenza drugs against SARS-CoV-2 in vitro: arbidol, baloxavir, laninamivir, oseltamivir, peramivir, and zanamivir. Among the six drugs, only arbidol efficiently inhibited SARS-CoV-2 infection. Functionally, it appears to block virus entry by impeding viral attachment and release from the endolysosomes. Although the selectivity index (SI) of arbidol is relatively low (SI=7.73), as a repurposed drug, its pharmacokinetics profile such



as maximal concentration (Cmax) is more important for predicting efficacy.

- [ACEi and ARBs not associated with adverse events or death](#)

Systematic review and meta-analysis did not find evidence of an increase in critical events and mortality in hospitalized patients given these medications for hypertension.

- [In silico screening of natural phytochemical compounds against COVID-19](#)

The authors created a phytochemical library of 318 phytochemicals from 11 plants which have been reported as having antiviral, antibacterial or antifungal activity. It was subjected to virtual screening against molecular targets; Main protease (Mpro) and Angiotensin-Converting Enzyme 2 (ACE2). The top 10 compounds were selected from each target.

- [Targeting virus protease: drug candidates found through virtual screening of the ChEMBL database](#)

The main protease M(pro) of SARS-CoV-2 is a potential target for treatment of COVID-19. A M(pro) homodimer structure suitable for docking simulations was prepared using a crystal structure. Structure-based virtual screenings of 1,485,144 compounds predicted 64 potential drugs (11 approved, 14 clinical, and 39 preclinical drugs) to show high binding affinity with M(pro). Additional docking simulations for predicted compounds with high binding affinity with M(pro) suggested that 28 bioactive compounds may have potential as effective anti-SARS-CoV-2 drug candidates.

- [Potential zinc benefit in non-randomized retrospective hydroxychloroquine+azithromycin study](#)

MedRxiv preprint of retrospective observational study, not peer-reviewed: Patients were categorized based on their exposure to hydroxychloroquine+azithromycin alone (n=521) or with zinc sulfate (n=411) as treatment in addition to standard supportive care. The two groups did not differ with respect to age, race, sex, tobacco use or past medical history. After adjusting for zinc therapy timing, the authors found that addition of zinc sulfate to hydroxychloroquine and azithromycin is associated with an increased frequency of being discharged home (OR 1.53, 95% CI 1.12-2.09) and significant reduction in mortality or transfer to hospice (OR 0.449, 95% CI 0.271-0.744).

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

Treatment trials: olokizumab, RPH-104, NT-17, azoximer bromide, acalabrutinib, clazakizumab, atorvastatin, melphalan, Chinese herbal medicine, sirukumab, ciclesonide, low-dose radiotherapy, hydroxychloroquine, ritonavir/lopinavir, tocilizumab, azithromycin, corticosteroid, low molecular weight heparin, oxygen, convalescent plasma, BNT162a1, BNT162b1, BNT162b2, BNT162c2. At time of writing, a total of [1271](#) were active, [63](#) completed, and [3](#) posted results.

## Other Science

- [Improved glycemic control associated with better outcomes type 2 diabetics](#)

This retrospective, multi-centered study (n=7,337) of COVID-19 patients in Hubei, China found that subjects with Type 2 diabetes (n=952) required more medical interventions and had a significantly higher mortality (7.8% vs 2.7%; adjusted HR, 1.49) and multiple organ injury than the non-diabetic individuals. Well-controlled blood glucose was associated with markedly lower mortality than individuals with poorly controlled blood glucose during hospitalization.

- [Psychological effects of virus outbreaks on healthcare workers: meta-analysis](#)

Compared with lower risk controls, staff in contact with affected patients had greater levels of both acute or post-traumatic stress (odds ratio 1.71, 95% CI 1.28 to 2.29) and psychological distress (1.74, 1.50 to 2.03), with similar results for continuous outcomes. Risk factors for psychological distress included being younger, being more junior, being the parents of dependent children, or having an infected family member. Clear communication, access to adequate personal protection, adequate rest, and both practical and psychological support were associated with reduced morbidity.

- [Italian survey of increased psychological distress during the COVID-19 pandemic](#)

An online survey using logistic regression models examined the associations between sociodemographic variables; personality traits; depression, anxiety, and stress. Female gender, negative affect, and detachment were associated with higher levels of depression, anxiety, and stress. Having an acquaintance infected increased levels of both depression and stress, whereas a history of stressful situations and medical problems was associated with higher levels of depression and anxiety. Finally, family members infected and young person and work outside their domicile presented higher levels of

anxiety and stress, respectively.

- [Computational prediction for disease progression in mild COVID-19](#)

The risk factors for requiring of oxygen support in mild COVID-19 were explored using multivariate logistic regression. Nomogram as visualization of the models was developed using R software (N=344 patients). When the laboratory data were not included in multivariate analysis, diabetes, coronary heart disease, T >=38.5 and sputum were independent risk factors of progressive COVID-19 (Model 1). When the blood routine test was included the CHD, T >=38.5 and NLR were found to be independent predictors (Model 2). The AUROC of model 2 was larger than model 1 (0.872 vs. 0.849, P =0.023). The negative predictive value of both models was greater than 96%, indicating they could serve as simple tools for ruling out the possibility of disease progression.

- [Liver injury increases with disease severity: Systematic review and meta-analysis](#)

*MedRxiv* preprint: Data from studies (n=57) on Chinese patients (n=9889) showed that among the patients with early infection, the incidence of liver injury events was 24.7% (95% CI, 23.4%-26.4%). Liver injury in severe patients was more common than that in non-severe patients, with a risk ratio of 2.07 (95% CI, 1.77 to 2.43). Quantitative analysis showed that the severe the coronavirus infection, the higher the level of aspartate aminotransferase, alanine aminotransferase, total bilirubin, alkaline phosphatase, and gamma-glutamyl transpeptidase and the lower the level of albumin.

- [A summary of environmental and health perspectives of COVID-19](#)

This Opinion Paper provides a summary of recent findings and solutions for a better understanding of the environmental and health problems associated with COVID-19. The list of topics covered is: meteorology and air quality factors with correlation number of infections, sewage waters as a way to reveal the scale of COVID-19 outbreak, current hospital disinfection procedures and new eco-friendly technologies and list of drug therapies recommend waiting for the desired vaccine to come.

- [Olfactory and Gustatory Dysfunction common in COVID-19 Patients: meta-analysis](#)

A meta-analysis of 10 studies (n=1627) showed a 52.73% (95% CI 26.64%-75.23%) prevalence of olfactory dysfunction among patients with COVID-19. An analysis of 9 studies (n=1390) showed a 43.93% (95% CI 20.46%-68.95%) prevalence of gustatory dysfunction. This indicates that olfactory and gustatory dysfunction are common symptoms in COVID-19 patients and may represent early symptoms in the clinical course of infection.

- [Evidence supports a causal model for Vitamin D in COVID-19 outcomes](#)

An analysis of global data for COVID-19 deaths and recoveries shows that outbreak severity displays a striking latitude relationship with a northern hemisphere bias. Using Causal Inference, the authors highlight known pathways that involve Vitamin D and show how these protect against viral infection and ameliorate symptoms in COVID-19 and other respiratory diseases.

- [COVID-19 Disease Map, a computational repository of virus-host interaction mechanisms](#)

The COVID-19 Disease Map is announced (<https://doi.org/10.17881/covid19-disease-map>), an effort to build a comprehensive, standardized knowledge repository of SARS-CoV-2 virus-host interaction mechanisms, guided by input from domain experts and based on published work.

**Contributing team members:** Christophe G. Lambert, Shawn Stoicu, Ingrid Hendrix, Lori Sloane, Anastasiya Nestsiarovich, Praveen Kumar, Nicolas Lauve, Ryen Ormesher, Lauren Tagliaferro Epler, Jenny Situ, Aly Raboff, John Powell, Alexandra Yingling, Cristian Bologna, Tudor Oprea, Gregory Mertz, Douglas J. Perkins.