A. Medicine and Health

December 10, 2020 (NEJM)
Efficacy of Tocilizumab in Patients Hospitalized with Covid-19
John H. Stone, Matthew J. Frigault, Naomi J. Serling-Boyd et al.
https://doi.org/10.1056/NEJMoa2028836

The efficacy of tocilizumab, an IL-6 receptor blocker, was tested in a randomized, controlled trial involving patients with COVID-19 who had fever, pulmonary infiltrates, or a need for supplemental oxygen. The authors found that the treatment had no significant effect on disease progression, independence from supplemental oxygen, or death.

December 10, 2020 (Int. J of Radiation Oncology*Biology*Physics)
Clinician attitudes to using low dose radiotherapy to treat COVID-19 lung disease
Catherine R. Hanna, Kathryn A. Robb, Kevin G. Blyth et al.
https://doi.org/10.1016/j.ijrobp.2020.12.003

Low dose radiotherapy (LDRT) has received both interest and criticism as a potential treatment for COVID-19 lung disease. In this qualitative study, the authors explored clinicians’ perspectives to identify barriers to testing LDRT in clinical trials and implementing them in clinical practice. The authors hope to address the barriers identified to facilitate research into the potential benefits of radiation treatment for patients with COVID-19 lung disease.

December 8, 2020 (The Lancet)
Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK
Merryn Voysey, Sue Ann Costa Clemens, Shabir A Madhi et al.
https://doi.org/10.1016/S0140-6736(20)32661-1

The authors evaluated the safety and efficacy of the ChAdOx1 nCoV-19 vaccine in a pooled interim analysis of four ongoing blinded, randomised, controlled trials across the UK, Brazil, and South Africa. Participants in the ChAdOx1 nCoV-19 group received two standard doses of the vaccine. The primary efficacy analysis included symptomatic COVID-19 in seronegative participants with a nucleic acid amplification test-positive swab more than 14 days after the second dose of vaccine. In this interim analysis of ongoing clinical trials, ChAdOx1 nCoV-19 has an acceptable safety profile and is efficacious against symptomatic COVID.
This study describes changes in portable oximeter–measured peripheral oxygen saturation ($\text{Spo}_2$ or $\text{O}_2\text{sat}$) in older adults before, during, and after wearing a 3-layer plane-shaped disposable nonmedical face mask widely used to protect against COVID-19. The authors found that wearing a 3-layer nonmedical face mask was not associated with a decline in oxygen saturation in older participants. Limitations to this study included small sample size, the exclusion of patients who were unable to wear a mask for medical reasons, investigation of only 1 type of mask and $\text{Spo}_2$ measurements during minimal physical activity.

This randomized trial compares the effects of fluvoxamine, a selective serotonin reuptake inhibitor with immunomodulatory effects vs placebo on a composite of dyspnoea or pneumonia and oxygen desaturation among adult outpatients with polymerase chain reaction–confirmed mild COVID-19 illness.

The authors conducted a retrospective nested case-control study in 2 French hospitals to estimate the prevalence of symptomatic pulmonary embolism (PE) in COVID-19 patients and to identify the clinical, radiological or biological characteristics associated with PE. Their results show a PE prevalence of close to 5% in COVID-19 patients. They found that PE appears to be associated with more extensive lung damage and more frequently requires invasive ventilation.

B. Science and Engineering

COVID-19 X-ray images classification based on enhanced fractional-order cuckoo search optimizer using heavy-tailed distributions
Dalia Yousri, Mohamed Abd Elaziz, Laith Abualigah et al.
https://doi.org/10.1016/j.asoc.2020.107052
The researchers propose a method that extracted the informative features from X-ray images. An enhanced cuckoo search optimization algorithm is proposed using fractional-order calculus and four different heavy-tailed distributions in place of the Lévy flight to strengthen the algorithm performance during dealing with COVID-19 multi-class classification optimization task. The results were compared with well-regarded optimization algorithms. The outcomes show that the proposed approach yield accurate results for UCI and COVID-19 data-sets.

December 24, 2020 (Results in Physics)  
A simple, SIR-like but individual-based epidemic model: Application in comparison of COVID-19 in New York City and Wuhan  
Xiaoping Liu  
https://doi.org/10.1016/j.rinp.2020.103712

An individual-based epidemic model, considering latent-infectious-recovery periods is presented. The analytic solution of the model in the form of recursive formulae with a time-dependent transmission coefficient is derived. The simulated epidemic curves fit very well with the daily reported cases of COVID-19 in Wuhan, China and New York City (NYC), USA. These simulations show that the transmission rate of NYC’s COVID-19 is nearly 30% greater than the transmission rate of Wuhan’s COVID-19.

December 24, 2020 (Environmental Research)  
Phase-wise analysis of the COVID-19 lockdown impact on aerosol, radiation and trace gases and associated chemistry in a tropical rural environment  
Chaithanya D. Jain, B. L. Madhavan, Vikas Singh et al.  
https://doi.org/10.1016/j.envres.2020.110665

Phase-wise variations in different aerosol, radiation and trace gases and their associated chemistry during the COVID-19 lockdown have been investigated over a tropical rural site Gadanki, India. In contrast with the studies over urban environments, air quality category over the rural environment remained the same during the lockdown despite the reduction in pollutants level. All the variations observed for different species and their associated chemistry demonstrates rural atmospheric chemistry and its intrinsic links with the precursor concentrations and dynamics.

December 23, 2020 (Infectious Disease)  
Assessment of Air Contamination by SARS-CoV-2 in Hospital Settings  
Gabriel Birgand, Nathan Peiffer-Smadja, Sandra Fournier et al.  
http://doi.org/10.1001/jamanetworkopen.2020.33232

This paper reviews current evidence on air contamination with SARS-CoV-2 in hospital settings and the factors associated with contamination, including viral load and particle size. The positivity rate of SARS-CoV-2 viral RNA and culture were described and compared according to the setting, clinical context, air
ventilation system, and distance from patients. High viral loads found in toilets and bathrooms, staff areas, and public hallways suggest that these areas should be carefully considered.

C. Social Sciences, Humanities and Public Policies

December 8, 2020 (Journal of Economics and Business)
Economic sentiment during the COVID pandemic: Evidence from search behaviour in the EU
Wouter Van der Wielen & Salvador Barrios
https://doi.org/10.1016/j.jeconbus.2020.105970

The authors show that the health crisis and the ensuing lockdown came with an unseen shift in households’ economic sentiment. First, using a European dataset of internet searches, they document a substantial increase in people's business cycle related searches. People's unemployment concerns rose drastically and a significant, coinciding slowdown in labour markets and consumption. The analysis shows that the ensuing shift in sentiment was significantly more outspoken in those hardest-hit countries. Various unprecedented fiscal policy actions, such as the short-time work schemes implemented or reformed at the onset of the COVID-crisis, however, have not eased economic sentiment.

December 3, 2020 (Heliyon)
Economic stimulus for COVID-19 pandemic and its determinants: evidence from a cross-country analysis
Md. Nur Alam Siddik
https://doi.org/10.1016/j.heliyon.2020.e05634

This research reports the extent and progress of stimulus packages by proposing a multidimensional index that standardizes governments’ economic responses so that we can examine the differences in economic policies. The Euclidean distance formula is applied to develop the new index and then identify the determinants of such economic stimulation. Chile, Switzerland, Croatia, Sweden and the Netherlands responded more strongly to the COVID-19 pandemic, while the remaining countries responded slightly to the pandemic.

November 23, 2020 (Journal of Pastoral Care & Counselling)
The COVID-19 Context Calls for a Broader Range of Healthcare Chaplaincy Models: An Exploratory Translational Study Utilizing Evolutionary Psychology and Social Neuroscience Loneliness Research
Ann K. Riggs
https://doi.org/10.1177/1542305020962417

Shifts in chaplain requests from patients and families and lack of engagement by staff in now-traditional support forms in the COVID-19 context suggest that new insights and resourcing are needed. This study suggests that the evolutionary
The sudden transition to online pedagogy as a result of COVID-19 in developing countries has revealed some inequalities and challenges, as well as benefits. These challenges and inequalities have now become the new realities in the educational sector of developing countries. She proposes a new approach to our education sector.