



## International EPI Cell Daily Evidence Digest – 02/04/2020

This briefing is produced by the PHE COVID-19 Literature Digest Team. The papers are organised under the following themes:

- Diagnostics and genomics
- Epidemiology and clinical
- Infection control
- Treatment
- Social sciences
- Miscellaneous
- Modelling

Please note that we are including preprints, which are preliminary reports of work that have NOT been peer-reviewed. They should not be relied on to guide clinical practice or health-related behaviour and should NOT be reported in news media as established information.

### Diagnostics and genomics

Publication Date	Title/URL	Journal/ Article type	Digest
30.03.2020	<a href="#">Timely Diagnosis and Treatment Shortens the Time to Resolution of Coronavirus Disease (COVID-19) Pneumonia and Lowers the Highest and Last CT Scores From Sequential Chest CT</a>	AJR Am J Roentgenol / Research article	<ul style="list-style-type: none"> <li>• 25 patients with COVID-19 confirmed by reverse transcription-polymerase chain reaction analysis underwent chest CT examinations, the time from symptom onset to diagnosis and treatment was recorded for each patient, and CT scores for each group were fitted using a Lorentzian line-shape curve to show the variation tendency during treatment.</li> <li>• The time from symptom onset to diagnosis and treatment had a positive correlation with the time to disease resolution (<math>r = 0.93</math>; <math>p = 0.000</math>) as well as with the highest CT score (<math>r = 0.83</math>; <math>p = 0.006</math>).</li> </ul>
25.03.2020	<a href="#">Diagnosis of the Coronavirus disease (COVID-19): rRT-PCR or CT?</a>	European Journal of Radiology / Article in press	<ul style="list-style-type: none"> <li>• A total of 36 patients were diagnosed with COVID-19 pneumonia. Thirty-five patients had abnormal CT findings at presentation, whereas one patient had a normal CT. Using rRT-PCR, 30 patients tested positive, with 6 cases initially missed.</li> <li>• Conclusion: rRT-PCR may produce initial false negative results. The authors suggest that</li> </ul>

			patients with typical CT findings but negative rRT-PCR results should be isolated, and rRT-PCR should be repeated to avoid misdiagnosis.
31.03.2020	<a href="#">Computed Tomographic Imaging of 3 Patients With Coronavirus Disease 2019 Pneumonia With Negative Virus Real-time Reverse-Transcription Polymerase Chain Reaction Test</a>	Clinical Infectious Diseases / Corrected proof	<ul style="list-style-type: none"> <li>• Describes 3 patients in Shenzhen University General Hospital who showed negative results before computed tomographic (CT) examination and were finally confirmed positive for SARS-CoV-2 by real-time RT-PCR (rRT-PCR) assay.</li> <li>• These cases suggest that PCR testing of nasopharyngeal swabs probably is not sensitive for COVID-19 at early stages of the clinical presentation.</li> </ul>
30.03.2020	<a href="#">Why is chest CT important for early diagnosis of COVID-19? Prevalence matters</a>	medRxiv (not peer-reviewed) / article	<ul style="list-style-type: none"> <li>• CT - gold standard for detection of interstitial pneumonia, often present in asymptomatic stage of COVID-19 - as complementary first line diagnosis.</li> <li>• Show CT scan presents a sensitivity of 95.48% (std.err=0.35%), vastly outperforming RT-PCR.</li> <li>• Generated model shows that CT scan is endowed with a high negative predictive value (&gt;90%) and positive predictive value (69 - 84%), for the range of prevalence seen in countries with rampant dissemination</li> <li>• Conclude that CT is an expedite and reliable diagnostic tool to support first line triage of suspect COVID-19 patients in areas where the diffusion of the virus is widespread.</li> </ul>
30.03.2020	<a href="#">Analytical sensitivity and efficiency comparisons of SARS-CoV-2 qRT-PCR assays</a>	medRxiv (not peer-reviewed) / article	<ul style="list-style-type: none"> <li>• Evaluate the primer-probe sets used in four common diagnostic assays</li> <li>• Show all primer-probe sets can be used to detect SARS-CoV-2, but clear differences in the ability to differentiate between true negatives and positives with low amounts of virus.</li> <li>• Many primer-probe sets, including "N2" &amp; "N3" sets issued by US Centres for Disease Control and Prevention, have background amplification with SARS-CoV-2-negative nasopharyngeal swabs, which may lead to inconclusive results.</li> </ul>
01.04.2020	<a href="#">Testing Individuals for Coronavirus Disease 2019 (COVID-19)</a>	JAMA / Patient information	<ul style="list-style-type: none"> <li>• Infographic and patient-oriented information about PCR testing.</li> </ul>
30.03.2020	<a href="#">Prediction of SARS-CoV-2 epitopes across 9360 HLA class I alleles</a>	bioRxiv (not peer-reviewed) / article	<ul style="list-style-type: none"> <li>• To facilitate the evaluation of antiviral CD8 T cell responses to SARS-CoV-2, the authors generated a publicly accessible database of epitopes predicted to bind any class I HLA protein across the entire SARS-CoV-2 proteome.</li> <li>• They also show evidence that these previously validated epitopes may be relevant in other HLA contexts,</li> <li>• This complete dataset is available publicly: <a href="https://pici-covid19-data-resources/mhci/peptide_predictions">gs://pici-covid19-data-resources/mhci/peptide_predictions</a>.</li> </ul>
26.03.2020	<a href="#">Scrutinizing the SARS-CoV-2 protein information for the designing an effective vaccine encompassing both the T-cell and B-cell epitopes</a>	bioRxiv (not peer-reviewed) / article	<ul style="list-style-type: none"> <li>• Authors exploited a next generation vaccinology approach to construct a multi-epitope vaccine candidate against SARS-CoV-2 with high antigenicity, safety and efficacy to combat this deadly infectious agent.</li> <li>• Study provides an initial platform of the rapid generation of an efficacious protective vaccine for combating COVID-19.</li> </ul>

01.04.2020	<a href="#">Analysis of angiotensin-converting enzyme 2 (ACE2) from different species sheds some light on cross-species receptor usage of a novel coronavirus 2019-nCoV</a>	Journal of Infection / Letter	<ul style="list-style-type: none"> <li>• Amino acid sequence alignment of ACE2 suggests similarity across a range of species including, non-human primates, companion animals, domestic animals wild animals (including Chinese horseshoe bat) and rodents.</li> <li>• The regions of ACE2 that bind to the S protein of SARS-COV-2, are most similar in humans and non-human primates, suggesting primates may be susceptible to COVID-19 and represent an effective animal model.</li> </ul>
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## Epidemiology and clinical

Publication Date	Title/URL	Journal/ Article type	Digest
30.03.2020	<a href="#">Analysis on 54 Mortality Cases of Coronavirus Disease 2019 in the Republic of Korea from January 19 to March 10, 2020</a>	J Korean Med Sci / Article	<ul style="list-style-type: none"> <li>• The authors summarize the mortality data from February 19 when the first mortality occurred up to March 10, 2020, in Korea with comparison to other countries. The overall case fatality rate of COVID-19 in Korea was 0.7% as of 0 am, March 10, 2020.</li> </ul>
13.03.2020	<a href="#">Clinical, laboratory and imaging features of COVID-19: A systematic review and meta-analysis</a>	Travel Medicine and Infectious Disease / Review	<ul style="list-style-type: none"> <li>• Randoms effects model meta-analysis of 19 studies describing clinical, laboratory and imaging of COVID-19.</li> <li>• Of 656 patients, fever (88.7%), cough (57.6%) and dyspnea (45.6%) were the most prevalent symptoms.</li> <li>• 20.3% required ICU, 32.8% presented with ARDS and 6.2% with shock.</li> <li>• 13.9% of hospitalized patients had fatal outcomes.</li> </ul>
01.04.2020	<a href="#">Characteristics of COVID-19 infection in Beijing</a>	Journal of Infection / Article	<ul style="list-style-type: none"> <li>• Clinical and epidemiological characteristics of 262 hospitalised COVID-19 cases in Beijing</li> <li>• 46 (17.6%) were severe cases, 216 (82.4%) were common cases, which including 192 (73.3%) mild cases, 11(4.2%) non-pneumonia cases and 13 (5.0%) asymptomatic cases respectively.</li> <li>• Median age of 47.5 years old and 48.5% were male.</li> <li>• 116 (60.4%) had close contact with confirmed cases, 21 (10.9%) had no contact history.</li> <li>• The most common symptoms: fever (82.1%), cough (45.8%), fatigue (26.3%), dyspnea (6.9%) and headache (6.5%).</li> <li>• The median incubation period was 6.7 days and the fatality of COVID-19 in Beijing was 0.9%.</li> </ul>
25.03.2020	<a href="#">ECMO for ARDS due to COVID-19</a>	Heart Lung / Correspondence	<ul style="list-style-type: none"> <li>• In China, approximately 5% (2087/44,672) of critically ill patients with COVID-19 infection have presented rapidly progressive respiratory failure, development of ARDS, and ICU admission.</li> <li>• Of the 2087 critically ill patients with COVID-19, 1023 (49%; 95%CI, 46.1% to 52.1%) have died in the ICU. The prevalence of ARDS caused by COVID-19 is approximately 8.2% (187/2278) (95% CI, 7.07% to 9.47%).</li> </ul>
29.03.2020	<a href="#">SARS-CoV-2 infection in health care workers: a retrospective analysis and a model study</a>	medRxiv (not peer reviewed) / Article	<ul style="list-style-type: none"> <li>• Risk factors in susceptibility for COVID-19, and infection patterns among healthcare workers (HCWs) through retrospective data collection for 118 HCWs (include 12 COVID-19 HCWs) from a single-centre.</li> </ul>

			<ul style="list-style-type: none"> <li>• Reducing the average contact rate per HCW by a 1.35 factor and susceptibility by a 1.40 factor can avoid an outbreak of the basic case among HCWs.</li> <li>• Poor sleep quality and high working pressure were positively associated with high risks of COVID-19.</li> </ul>
29.03.2020	<a href="#">68 Consecutive patients assessed for COVID-19 infection; experience from a UK regional infectious disease unit</a>	Influenza Other Respir Viruses / Article	<ul style="list-style-type: none"> <li>• Authors report a series of 68 patients assessed at a Regional Infection Unit in the UK.</li> <li>• Majority had mild illness not requiring clinical intervention. Finding supports a community testing approach, supported by clinicians able to review more unwell patients. Strategies must be in place to accommodate increased screening intensity,</li> </ul>
24.03.2020	<a href="#">Prevalence of Underlying Diseases in Hospitalized Patients with COVID-19: a Systematic Review and Meta-Analysis</a>	Arch Acad Emerg Med / Review	<ul style="list-style-type: none"> <li>•The data of 76993 patients presented in 10 articles were included in meta-analysis, which assessed the prevalence of underlying disease in COVID-19 patients.</li> <li>•The pooled prevalence was 16.37% for hypertension, 12.11% for cardiovascular disease, 7.63% for smoking history and 7.87% for diabetes in people infected with SARS-CoV-2.</li> </ul>
31.03.2020	<a href="#">Diabetes is a risk factor for the progression and prognosis of COVID-19</a>	Diabetes Metabolism Research and Reviews / Research article	<ul style="list-style-type: none"> <li>• A total of 174 consecutive patients confirmed with COVID-19 were studied to assess diabetes as risk factor for the progressions and prognosis of COVID-19.</li> <li>• Their data support the notion that diabetes should be considered as a risk factor for a rapid progression and bad prognosis of COVID-19. More intensive attention should be paid to patients with diabetes, in case of rapid deterioration.</li> </ul>
31.03.2020	<a href="#">Covid-19 and diabetes mellitus: unveiling the interaction of two pandemics</a>	Diabetes Metabolism Research and Reviews / Commentary	<ul style="list-style-type: none"> <li>• Among different cytokines that were found significantly higher in patients with diabetes compared to those without, Interleukin-6 (IL-6) which is already increased in conditions of chronic inflammation, may play a more deleterious role in Covid-19 infection.</li> <li>• Targeting the over expression of Il-6 effects with a monoclonal antibody against IL-6 receptor or using Janus Kinase inhibitors may be particularly helpful for treatment of Covid-19 pneumonia in diabetes</li> </ul>
10.03.2020	<a href="#">Clinical considerations for patients with diabetes in times of COVID-19 epidemic</a>	Diabetes & Metabolic Syndrome: Clinical Research & Reviews / Review	<ul style="list-style-type: none"> <li>•The paper describes specific measures for the clinical handling of patients with diabetes, including measures to prevent infection, hospital management, and possible treatment.</li> </ul>
31.03.2020	<a href="#">Analysis of heart injury laboratory parameters in 273 COVID-19 patients in one hospital in Wuhan, China</a>	Journal of Medical Virology / Research article	<ul style="list-style-type: none"> <li>• In this study, the authors detected and analysed the main laboratory indicators related to heart injury, CK-MB, MYO, ultra-TnI and NT-proBNP, in 273 COVID-19 patients and investigated the correlation between heart injury and severity of the disease.</li> <li>• It was found that higher concentration in venous blood of CK-MB, MYO, ultra-TnI and NT-proBNP were associated with the severity and case-fatality rate of COVID-19.</li> <li>• Careful monitoring of the myocardial enzyme profiles is of great importance in reducing the complications and mortality in COVID-19 patients.</li> </ul>

28.03.2020	<a href="#">Chronic kidney disease is associated with severe coronavirus disease 2019 (COVID-19) infection</a>	Int Urol Nephrol / Letter	<ul style="list-style-type: none"> <li>• Based on a contrite meta-analysis of early and preliminarily available data, CKD seems to be associated with enhanced risk of severe COVID-19 infection.</li> <li>• Recommends patients with CKD take extra precaution to minimize risk exposure; physicians closely monitor CKD patients with suspected COVID-19, for timely detecting signs of disease progression; presence of CKD regarded as important factor in future risk stratification models for COVID-19.</li> </ul>
26.03.2020	<a href="#">Comparison of Hospitalized Patients with Acute Respiratory Distress Syndrome Caused by COVID-19 and H1N1</a>	Chest / Article	<ul style="list-style-type: none"> <li>• This was a retrospective case-control study. They compared two independent cohorts of ARDS patients infected with either COVID-19 (n=73) or H1N1 (n=75). They analysed and compared their clinical manifestations, imaging characteristics, treatments, and prognosis.</li> <li>• There were many differences between COVID-19 and H1N1-induced ARDS patients in clinical presentations. Compared with H1N1, patients with COVID-19 induced ARDS had lower severity of illness scores at presentation and lower SOFA-score adjusted mortality.</li> <li>• The in-hospital mortality of COVID-19 patients was 28.8%, while that of H1N1 patients was 34.7% (p=0.483).</li> </ul>
26.03.2020	<a href="#">Clinical characteristics of COVID-19-infected cancer patients: A retrospective case study in three hospitals within Wuhan, China</a>	Annals of Oncology / Article	<ul style="list-style-type: none"> <li>• Cancer patients show deteriorating conditions and poor outcomes from the COVID-19 infection. It is recommended that cancer patients receiving anti-tumour treatments should have vigorous screening for COVID-19 infection and should avoid treatments causing immunosuppression or have their dosages decreased in case of COVID-19 co-infection.</li> <li>• Univariate and multivariate analyses were performed to assess the risk factors associated with severe events defined as a condition requiring admission to an intensive care unit, the use of mechanical ventilation, or death.</li> <li>• If the last anti-tumour treatment was within 14 days, it significantly increased the risk of developing severe events (HR=4.079, 95%CI 1.086-15.322, P=0.037).</li> </ul>
31.03.2020	<a href="#">COVID-19-associated Acute Hemorrhagic Necrotizing Encephalopathy: CT and MRI Features /</a>	Radiology / Article	<ul style="list-style-type: none"> <li>• Reports the first presumptive case of COVID-19-associated acute necrotizing haemorrhagic encephalopathy, a rare encephalopathy yet to be demonstrated as a result of COVID-19 infection.</li> <li>• Advises clinicians and radiologists to watch for this presentation among patients presenting with COVID-19 and altered mental status.</li> </ul>
18.03.2020	<a href="#">Clinical characteristics of novel coronavirus disease 2019 (COVID-19) in newborns, infants and children</a>	Pediatrics and Neonatology / Article in press	<ul style="list-style-type: none"> <li>• Review of clinical characteristics of children and infants in China</li> <li>• Most infected children have mild clinical manifestations, and the prognosis is good, however some case studies suggest children can be susceptible to severe infection.</li> <li>• Few cases of neonatal infection, likely transmission through close contact to infected mother rather than vertical transmission.</li> </ul>
01.04.2020	<a href="#">An Uncomplicated Delivery in a Patient with Covid-19 in the United States</a>	New England Journal of Medicine / Case report	<ul style="list-style-type: none"> <li>• This case describes uncomplicated labour and vaginal delivery in a woman with Covid-19. Care was taken to avoid infecting hospital staff, and 7 days after the delivery, no caregivers appeared to be infected.</li> </ul>

22.03.2020	<a href="#">Three children who recovered from novel coronavirus 2019 pneumonia</a>	Journal of Paediatrics and Child Health / Brief Communication	<ul style="list-style-type: none"> <li>• In the isolation ward of the children's hospital affiliated to Zhengzhou University, three children were hospitalised with pneumonia caused by SARS-CoV-2. Two were sisters, aged 6 and 8 years old and one was a 6-month-old boy.</li> <li>• All three patients had fever, and two had nasal congestion and rhinitis, associated with fatigue, diarrhoea and headache. The 6-year-old girl mainly had cough. None had dyspnoea or cyanosis. Their computerised tomographic scans are shown in the article.</li> <li>• None of the children required intensive care or mechanical ventilation or had any severe complications.</li> </ul>
31.03.2020	<a href="#">COVID-19 epidemic: disease characteristics in children</a>	Journal of Medical Virology / Article	<ul style="list-style-type: none"> <li>• This article reviews the epidemiological characteristics of COVID-19 in children.</li> </ul>
01.04.2020	<a href="#">Guillain-Barre syndrome associated with SARS-CoV-2 infection: causality or coincidence?</a>	The Lancet Neurology / Letter	<ul style="list-style-type: none"> <li>• Report of the first case of COVID-19 initially presenting with acute Guillain-Barré syndrome.</li> </ul>
26.03.2020	<a href="#">COVID-19 in a Patient Presenting with Syncope and a Normal Chest X-ray</a>	Rhode Island Medical Journal / Article	<ul style="list-style-type: none"> <li>• The authors present an elderly female who arrived to the hospital after a syncopal episode. She was afebrile with a normal chest X-ray and there was no suspicion of COVID-19. She then developed a fever and tested positive for COVID-19.</li> <li>• Their unique case underscores the increasing diversity of COVID-19 presentations and potential for initial mis-diagnosis and delay in implementing proper precautions.</li> </ul>
29.03.2020	<a href="#">COVID-19 : Face Masks and Human-to-human Transmission</a>	Influenza Other Respir Viruses / Letter	<ul style="list-style-type: none"> <li>• Case of a patient from Chongqing, China, who transmitted COVID-19 to 5 people in one vehicle when he didn't wear a face mask.</li> <li>• No one was infected later in the second vehicle he took when he wore a face mask.</li> <li>• The Chinese CDC conducted an epidemiological investigation and close contact tracing management.</li> </ul>
01.04.2020	<a href="#">Early epidemiological analysis of the coronavirus disease 2019 outbreak based on crowdsourced data: a population-level observational study</a>	The Lancet Digital Health / Article	<ul style="list-style-type: none"> <li>• Population-level observational study using social and news media to describe epidemiological trends.</li> <li>• 507 patients with COVID-19 reported between Jan 13 and Jan 31, 2020 are included from mainland China and outside of China.</li> <li>• 281 (55%) patients were male and the median age was 46 years.</li> <li>• Delays between symptom onset and seeking care at a hospital or clinic were longer in Hubei province than in other provinces in mainland China and internationally.</li> <li>• Data aligns with official reports published by Chinese authorities.</li> </ul>
01.04.2020	<a href="#">SARS-CoV-2 in wastewater: potential health risk, but also data source</a>	The Lancet Gastroenterology & Hepatology / Correspondence	<ul style="list-style-type: none"> <li>• Following the first reports of the detection of SARS-CoV-2 in faeces, this reports a study in the Netherlands investigating whether human wastewater might contain the novel coronavirus.</li> <li>• Samples of wastewater from Schipol Airport tested positive for virus RNA by quantitative RT-PCR methodology 4 days after the first cases of COVID-19 were identified in the Netherlands on Feb 27, 2020 .</li> <li>• These findings indicate that wastewater could be a sensitive surveillance system and early</li> </ul>

			warning tool, as was previously shown for poliovirus. <ul style="list-style-type: none"> <li>• Whether SARS-CoV-2 is viable under environmental conditions that could facilitate faecal–oral transmission is not yet clear.</li> </ul>
23.03.2020	<a href="#">How to link patients with suspicious COVID-19 to health system from the community pharmacies? A route proposal</a>	Research in Social and Administrative Pharmacy / Article	<ul style="list-style-type: none"> <li>• Approach to the role of community pharmacists in Colombia.</li> <li>• Three possible routes are described depending on the needs of the users: anti-flu drugs, symptoms related to COVID-19 infection or the request for items for hygiene and prevention of transmission such as alcohol and face masks.</li> <li>• self-care education should be given, and the possible cases should be reported to continue the healthcare process.</li> </ul>
31.03.2020	<a href="#">ISUOG Consensus Statement on organization of routine and specialist obstetric ultrasound services in the context of COVID-19</a>	Ultrasound in Obstetrics and Gynecology / Consensus Statement	<ul style="list-style-type: none"> <li>• This statement is intended for doctors and staff working in routine, high-risk and specialist obstetric ultrasound services offering care to pregnant women. Ultrasound investigation is an essential part of care in these areas.</li> <li>• Routine and specialist obstetric ultrasound scans are an important part of prenatal care that need to be maintained despite the ongoing coronavirus disease 2019 (COVID-19) pandemic with all its associated comorbidities</li> </ul>
01.04.2020	<a href="#">Coronavirus 2019-nCoV: A brief perspective from the front line</a>	Journal of Infection / Article	<ul style="list-style-type: none"> <li>• A review of the context of COVID-19 in China, including genomics of SARS-CoV-2, epidemiology, clinical characteristics and potential treatments.</li> </ul>
25.03.2020	<a href="#">COVID-19: Pandemic Contingency Planning for the Allergy and Immunology Clinic</a>	The Journal of Allergy and Clinical Immunology: In Practice / Special Article	<ul style="list-style-type: none"> <li>• A consensus-based ad-hoc expert panel of allergy/immunology specialists from the United States and Canada developed a service and patient prioritization schematic to temporarily triage allergy/immunology services. Recommendations and feedback were developed iteratively, using an adapted modified Delphi methodology to achieve consensus.</li> </ul>

## Infection control

Publication Date	Title/URL	Journal/ Article type	Digest
31.03.2020	<a href="#">Interventional radiology and COVID-19: evidence-based measures to limit transmission</a>	Diagnostic and Interventional Radiology / Review	<ul style="list-style-type: none"> <li>• Certain subspecialties like interventional radiology entails a greater risk of acquiring and transmitting infection due to the close patient contact and invasive patient care the service provides.</li> <li>• Authors put forth an all-encompassing review of infection control measures that cover the dynamics of patient care and staff protocols that such a situation demands of an interventional department.</li> </ul>
31.03.2020	<a href="#">COVID-19 epidemic: disentangling the re-emerging controversy about</a>	International Journal of	<ul style="list-style-type: none"> <li>• Identifies three key epidemiological questions: Can infected individuals reduce the risk of spreading the virus to others by wearing facemasks? Can uninfected people reduce the risk of infection by wearing facemasks? Can widespread use of facemasks in a population facilitate the</li> </ul>

	<a href="#">medical facemasks from an epidemiological perspective</a>	Epidemiology / Opinion	control of an epidemic? <ul style="list-style-type: none"> <li>• Call for further RCTs and cost-effectiveness studies should be conducted swiftly to clarify the controversy.</li> </ul>
01.05.2020	<a href="#">Anesthetic Management of Patients With Suspected or Confirmed 2019 Novel Coronavirus Infection During Emergency Procedures</a>	Journal of Cardiothoracic and Vascular Anesthesia / Article	<ul style="list-style-type: none"> <li>• Retrospective clinical study evaluating anaesthesia management protocols in Wuhan hospitals to prevent cross-infection with COVID-19 in operating rooms.</li> <li>• Cross-infection in the operating rooms of the 4 hospitals was effectively reduced.</li> <li>• Emergency surgical anaesthesia was needed for 37 patients with confirmed or suspected COVID-19.</li> <li>• 3 health care providers were infected in the clinic setting from January 23 to 31, 2020.</li> </ul>
29.03.2020	<a href="#">Clinical Characteristics of 54 medical staff with COVID-19: A retrospective study in a single center in Wuhan, China</a>	J Med Virol / Article	<ul style="list-style-type: none"> <li>• From January 7 to February 11, 2020, 54 medical staff of Tongji Hospital were hospitalized due to COVID-19. Most of them were from other clinical departments (72.2%) rather than emergency department (3.7%) or medical technology departments (18.5%).</li> <li>• The authors suggest training for all hospital staff to prevent infection and preparation of sufficient protection and disinfection materials.</li> </ul>
26.03.2020	<a href="#">Integrative considerations during the COVID-19 pandemic</a>	Explore / Review Article	<ul style="list-style-type: none"> <li>• Using available in-vitro evidence, an understanding of the virulence of COVID-19, as well as data from similar, but different, viruses, the authors offer strategies to augment public health measures to prevent COVID-19 and associated pneumonia.</li> </ul>
01.04.2020	<a href="#">Strategic plan for management of COVID-19 in paediatric haematology and oncology departments</a>	The Lancet Haematology / Comment	<ul style="list-style-type: none"> <li>• The authors propose a strategic plan for the management of COVID-19 outbreaks in paediatric haematology and oncology departments, focusing primarily on viral infection prevention and control strategies.</li> </ul>
29.03.2020	<a href="#">Detection of Air and Surface Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in Hospital Rooms of Infected Patients</a>	medRxiv (not peer-reviewed) / article	<ul style="list-style-type: none"> <li>• Environmental contamination was detected in rooms with COVID-19 patients in early stages of illness, but was significantly less after day 7 of disease.</li> <li>• Under AIIR conditions, SARS-CoV-2 respiratory particles can be detected at sizes 1-4 µm and &gt;4 µm in diameter in the air which warrants further study.</li> </ul>

## Treatment

Publication Date	Title/URL	Journal/ Article type	Digest
28.02.2020	<a href="#">Clinical Study of Mesenchymal Stem Cell Treatment for Acute Respiratory Distress Syndrome Induced by Epidemic Influenza A (H7N9) Infection: A Hint for COVID-19 Treatment</a>	Engineering / Article	<ul style="list-style-type: none"> <li>• The paper suggests that Mesenchymal Stem Cell (MSC) therapy may be appropriate to treat Acute Respiratory Distress Syndrome (ARDS) caused by COVID-19.</li> <li>• MSC treatment has been effective in reducing mortality of ARDS caused by H7N9 viruses in clinical trials in 2013.</li> </ul>

31.03.2020	<a href="#">3D printed circuit splitter and flow restriction devices for multiple patient lung ventilation using one anaesthesia workstation or ventilator</a>	Anaesthesia / Letter	<ul style="list-style-type: none"> <li>• Describes use of 3D printed flow splitting and flow restrictor devices for emergency ventilation of two patients</li> <li>• Bench testing demonstrated acceptable performance for use in the short-term emergency ventilation setting. The large drop in tidal volume with the restrictor demonstrates the potential for pairing two sets of lungs with markedly different compliance or target tidal volume.</li> <li>• 3D printing models have been published on the author's website (<a href="https://alexanderclarke.id.au">https://alexanderclarke.id.au</a>) and Prusa Printers (<a href="https://prusaprinters.org">https://prusaprinters.org</a>) and are freely available for modification and 3D printing</li> </ul>
29.03.2020	<a href="#">Antipsoriatic treatments during COVID-19 outbreak</a>	Dermatol Ther / Letter	<ul style="list-style-type: none"> <li>• Response to concern about starting immunosuppressive therapy with conventional or biological antipsoriatic treatments; fear that immunosuppressive effect of these drugs might increase the risk of infectious complications and promote the spreading of COVID-19 infection in patients with psoriasis.</li> <li>• Concludes that complex interplay between viral replication and host immune response and presently, a case-by-case assessment seems more appropriate</li> </ul>
25.03.2020	<a href="#">Research and Development on Therapeutic Agents and Vaccines for COVID-19 and Related Human Coronavirus Diseases</a>	ACS Central Science / Article	<ul style="list-style-type: none"> <li>• This report provides an overview of published information on global research and development of coronavirus-related therapeutic agents and preventive vaccines based on the extensive CAS content collection, with a focus on patents.</li> <li>• It includes an overview of coronavirus morphology, biology, and pathogenesis with a particular focus on antiviral strategies involving small molecule drugs, as well as biologics targeting complex molecular interactions involved in coronavirus infection and replication.</li> <li>• The drug-repurposing effort summarized in this report is focused primarily on agents currently known to be effective against other RNA viruses including SARS-CoV, MERS-CoV, influenza, HCV, and Ebola as well as anti-inflammatory drugs.</li> </ul>
01.04.2020	<a href="#">Harnessing Our Humanity — How Washington's Health Care Workers Have Risen to the Pandemic Challenge</a>	New England Journal of Medicine / Perspective	<ul style="list-style-type: none"> <li>• Discusses the difficulties of providing supportive end-of-life care in patients infected with COVID-19 from the perspective of a Seattle hospital.</li> <li>• The chaos caused by constantly changing and conflicting guidance, the challenges related to shortages of tests and personal protective equipment (PPE), and the terrifying uncertainty about what's coming next, demonstrate the need for clear leadership and guidance.</li> </ul>
30.03.2020	<a href="#">COVID-19 and chronological aging: senolytics and other anti-aging drugs for the treatment or prevention of corona virus infection?</a>	Aging (Albany NY) / Article	<ul style="list-style-type: none"> <li>• The higher mortality rate in patients with advanced chronological age begs the question as to whether there is a functional association between COVID-19 infection and the process of chronological aging.</li> <li>• The authors therefore speculate that the fight against COVID-19 disease should involve testing the hypothesis that senolytics and other anti-aging drugs may have a prominent role in preventing the transmission of the virus, as well as aid in its treatment.</li> </ul>
30.03.2020	<a href="#">Pathways for urology patients during the COVID-19 pandemic</a>	Minerva Urol Nefrol / Article	<ul style="list-style-type: none"> <li>• A panel of Italian urologists has agreed on a set of recommendations on pathways of pre-, intra- and post-operative care for urological patients undergoing urgent procedures or non-deferrable oncological interventions during the COVID-19 pandemic.</li> </ul>

31.03.2020	<a href="#">CD-sACE2 Inclusion Compounds: An Effective Treatment for Corona Virus Disease 2019 (COVID-19)</a>	Journal of Medical Virology / Letter	<ul style="list-style-type: none"> <li>• Introduces the mechanisms and drug fabrication methods of CD-sACE2 inclusion compounds for the treatment of COVID-19.</li> <li>• The application of sACE2 can potentially prevent the viruses from infecting healthy cells by binding to the S-proteins of the virus and destroying its ability to mutate. All the ACE2-receptor viruses can be blocked by sACE2.</li> <li>• Authors hope to begin clinical trials as soon as possible.</li> </ul>
30.03.2020	<a href="#">The experience of high-flow nasal cannula in hospitalized patients with 2019 novel coronavirus-infected pneumonia in two hospitals of Chongqing, China</a>	Ann Intensive Care / Research article	<ul style="list-style-type: none"> <li>• In China most critically ill patients received high-flow nasal cannula (HFNC) oxygen therapy. However, the experience of HFNC in this population is lacking.</li> <li>• This study indicated that HFNC was the most common ventilation support for patients with NCIP. Patients with lower PaO<sub>2</sub>/FiO<sub>2</sub> were more likely to experience HFNC failure.</li> </ul>
01.04.2020	<a href="#">Active and Effective Measures for the Care of Patients With Cancer During the COVID-19 Spread in China</a>	JAMA Oncology / Viewpoint	<ul style="list-style-type: none"> <li>• After the Chinese Spring Festival, the Cancer Hospital, Chinese Academy of Medical Sciences initiated the level-1 response (the highest emergency response measures) to COVID-19.</li> <li>• Under the strict screening strategy, 27 patients showed radiologic manifestations of inflammatory changes or multiple-site exudative pneumonia in the lungs, 8 of whom were suspected of having COVID-19 infection. Fortunately, negative results from nucleic acid testing ultimately excluded COVID-19 infection in all these patients. Importantly, 2 of these patients presented with recovered pneumonia after symptomatic treatment.</li> <li>• Under the strict protective measures, not a single patient or staff member had been diagnosed with COVID-19 infection as of March 3, 2020.</li> </ul>
28.03.2020	<a href="#">Clinical observations of low molecular weight heparin in relieving inflammation in COVID-19 patients: A retrospective cohort study</a>	medRxiv (not peer-reviewed) / article	<ul style="list-style-type: none"> <li>• Patients in the study were divided into a heparin and a control group based on whether low molecular weight heparin (LMWH) was used.</li> <li>• Compared to the control group, patients in the heparin group had a higher percentage of lymphocytes after treatment and lower levels of interleukin-6; these differences were statistically significant.</li> <li>• Under conventional antiviral treatment regimens, LMWH can improve hypercoagulability, inhibit IL-6 release, and counteract IL-6 biological activity in patients. LMWH has potential antiviral effects and can help delay or block inflammatory cytokine storms. It can also increase the lymphocytes (LYM%) of patients and has the potential for treatment of COVID-19.</li> </ul>

### Social sciences

Publication Date	Title/URL	Journal/ Article type	Digest
20.03.2020	<a href="#">The psychological impact of the COVID-19 epidemic on college students in China</a>	Psychiatry Research / Article	<ul style="list-style-type: none"> <li>• Cluster sample of 7,143 college students from Changzhi medical college completed a questionnaire including Generalized Anxiety Disorder Scale (GAD-7). They received 7,143 responses.</li> </ul>

			<ul style="list-style-type: none"> <li>• 0.9% were experiencing severe anxiety, 2.7% moderate anxiety, and 21.3% mild anxiety.</li> <li>• Moreover, living in urban areas, family income stability and living with parents were protective factors against anxiety.</li> <li>• Having relatives or acquaintances infected with COVID-19, economic effects and their effect on daily life, and delays in academic activities were risk factors for increasing anxiety.</li> </ul>
01.04.2020	<a href="#">Potential Legal Liability for Withdrawing or Withholding Ventilators During COVID-19: Assessing the Risks and Identifying Needed Reforms</a>	JAMA / Viewpoint	<ul style="list-style-type: none"> <li>• Discussion of the legal ramifications of either withholding or withdrawing a ventilator from a patient who would ordinarily receive such aid in the absence of a public health emergency, with reference to Maryland.</li> </ul>
01.04.2020	<a href="#">Racism and discrimination in COVID-19 responses</a>	The Lancet / Correspondence	<ul style="list-style-type: none"> <li>• The author argues that outbreaks create fear, a key ingredient for racism and xenophobia to thrive. The COVID-19 pandemic has uncovered social and political fractures within communities, with racialised and discriminatory responses to fear, disproportionately affecting marginalised groups.</li> </ul>
30.03.2020	<a href="#">Letter to the editor: Headline stress disorder caused by Netnews during the outbreak of COVID-19</a>	Health Expectations / Letter	<ul style="list-style-type: none"> <li>• 'Headline stress disorder' describes the psychological disorder caused by news coverage of global incidents.</li> <li>• The letter presents the results of an online survey on the perception of online news in China with 1206 members of the general public, including 478 males and 728 females.</li> </ul>

## Modelling

Publication Date	Title/URL	Journal/ Article type	Digest
01.04.2020	<a href="#">Using observational data to quantify bias of traveller-derived COVID-19 prevalence estimates in Wuhan, China</a>	The Lancet Infectious Diseases / Article	<ul style="list-style-type: none"> <li>• The authors used a Bayesian modelling approach to estimate the relative capacity for detection of imported cases of COVID-19 for 194 locations (excluding China) compared with that for Singapore.</li> <li>• The weighted global ability to detect Wuhan-to-location imported cases of COVID-19 was estimated to be 38% (95% highest posterior density interval [HPDI] 22–64) of Singapore's capacity. This value is equivalent to 2.8 (95% HPDI 1.5–4.4) times the current number of imported and reported cases that could have been detected if all locations had had the same detection capacity as Singapore. Using the second component of the Global Health Security index to stratify likely case-detection capacities, the ability to detect imported cases relative to Singapore was 40% (95% HPDI 22–67) among locations with high surveillance capacity, 37% (18–68) among locations with medium surveillance capacity, and 11% (0–42) among locations with low surveillance capacity.</li> <li>• The authors conclude that estimates of case counts in Wuhan based on assumptions of 100%</li> </ul>

			detection in travellers could have been underestimated by several fold. Furthermore, severity estimates will be inflated several fold since they also rely on case count estimates.
01.04.2020	<a href="#">COVID-19 pandemic in west Africa</a>	The Lancet Global Health / Commentary	<ul style="list-style-type: none"> <li>• The authors used data from the COVID-19 data repository of the Johns Hopkins Centre for Systems Science and Engineering to plot the cumulative number of cases since the diagnosis of both the first patient and the first five patients by country, both in Europe and Africa.</li> <li>• Early comparisons between the number of confirmed cases in the worst affected European countries and the west African countries with confirmed COVID-19 cases do not support the hypothesis that the virus will spread more slowly in countries with warmer climates.</li> </ul>
30.03.2020	<a href="#">Report 13: Estimating the number of infections and the impact of non-pharmaceutical interventions on COVID-19 in 11 European countries</a>	Imperial College / Report	<ul style="list-style-type: none"> <li>• Report from a series prepared by the Imperial College COVID-19 Response Team, modelling the impact across 11 European countries of non-pharmaceutical interventions to contain virus spread.</li> <li>• Overall, they estimate that countries have managed to reduce their reproduction number.</li> <li>• Given the lag of 2-3 weeks between when transmission changes occur and when their impact can be observed in trends in mortality, for most of the countries considered here it remains too early to be certain that recent interventions have been effective. It is therefore critical that the current interventions remain in place and trends in cases and deaths are closely monitored in the coming days and weeks to provide reassurance that transmission of SARS-Cov-2 is slowing.</li> </ul>
24.03.2020	<a href="#">Dynamic models for Coronavirus Disease 2019 and data analysis</a>	Mathematical Methods in the Applied Sciences / Letter	<ul style="list-style-type: none"> <li>• In this letter, two time delay dynamic models, a Time Delay Dynamical–Novel Coronavirus Pneumonia (TDD-NCP) model and Fudan-Chinese CDC model, are introduced to track the data of COVID-19.</li> <li>• The TDD-NCP model introduced the time delay process into the differential equations to describe the latent period of the epidemic.</li> <li>• The Fudan-CDCC model was established when Wenbin Chen suggested to determine the kernel functions in the TDD-NCP model by the public data from CDCC.</li> <li>• By the public data of the cumulative confirmed cases in different regions in China and different countries, these models can clearly illustrate that the containment of the epidemic highly depends on early and effective isolations.</li> </ul>
30.03.2020	<a href="#">Assessing the interactions between COVID-19 and influenza in the United States</a>	medRxiv (not peer-reviewed) / article	<ul style="list-style-type: none"> <li>• Propose that precautionary behaviours driven by COVID-19 risk perception or increased isolation driven by undetected COVID-19 spread dampened the influenza season.</li> <li>• Suggest that when surveillance for a novel pathogen is limited, surveillance streams of co-circulating infections may provide a signal.</li> </ul>

Produced by the PHE COVID-19 Literature Digest Team

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