



## International EPI Cell Daily Evidence Digest – 07/05/2020

This Daily Evidence Digest is produced by the PHE COVID-19 Literature Digest Team as a resource for professionals working in public health. We do not accept responsibility for the availability, reliability or content of the items included in this resource and do not necessarily endorse the views expressed within them. The papers are organised under the following themes:

- Diagnostics
- Genomics
- Epidemiology and clinical - children and pregnancy
- Epidemiology and clinical - risk factors
- Epidemiology and clinical - other
- Infection control
- Treatment
- Social sciences
- Miscellaneous
- Modelling
- Guidance, consensus statements and hospital resources (no digest)
- Overviews, comments and editorials (no digest)

Please note that we are including preprints (**highlighted in red**), which are preliminary reports of work that have NOT been peer-reviewed.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

| Publication Date | Title/URL   | Digest                                  | Journal   |
|------------------|---|---|---|
| 09.04.2020       | <a href="#">Renal histopathological analysis of 26 postmortem findings of patients with COVID-19 in China</a> | Kidney international / Article in press | <ul style="list-style-type: none"><li>• Describes an analysis of kidney abnormalities in 26 autopsies of patients with COVID-19 by light microscopy, ultrastructural observation and immunostaining.</li><li>• By light microscopy, diffuse proximal tubule injury with the loss of brush</li></ul> |

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|            |  |                                       | <p>border, non-isometric vascular degeneration, and even frank necrosis was observed.</p> <ul style="list-style-type: none"> <li>• The receptor of SARS-CoV-2, ACE2 was found to be upregulated in patients with COVID-19, and immunostaining with SARS-CoV nucleoprotein antibody was positive in tubules.</li> </ul>   |
| 27.04.2020 | <a href="#">Multicenter cohort study demonstrates more consolidation in upper lungs on initial CT increases the risk of adverse clinical outcome in COVID-19 patients</a>  | Theranostics / article                | <ul style="list-style-type: none"> <li>• In this retrospective cohort study, 421 laboratory-confirmed COVID-19 patients were included in analysis, and CT imaging characteristics and risk factors associated with adverse composite endpoints were assessed.</li> <li>• There was an association of older age and larger consolidation in upper lungs on admission with higher odds of poor outcomes in patients with COVID-19.</li> </ul>  |
| 01.05.2020 | <a href="#">Lung disease severity, Coronary Artery Calcium, Coronary inflammation and Mortality in Coronavirus Disease 2019</a>  | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• Study association of extent of lung disease or coronary artery chest computed tomography (HRCT) variables, the Agatston coronary calcium score (CCS) and peri-coronary adipose tissue attenuation (PCAT), representing CAD and coronary inflammation, with mortality in 279 patients with COVID-19.</li> <li>• Increased age, D-dimer, C-reactive protein and the HRCT image features of extent of lung disease and coronary inflammation by PCAT (but not the CCS) were independently associated with mortality in hospitalized COVID-19 patients.</li> <li>• Study suggests that higher mortality in COVID-19 may be at least partly mediated by coronary artery inflammation.</li> </ul>   |
| 04.05.2020 | <a href="#">Pooling RT-PCR test of SARS-CoV-2 for large cohort of 'healthy' and infection-suspected patients: A prospective and consecutive study on 1,000 individuals</a> | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• To validate feasibility of pooling samples, serial dilution analysis and spike-in experiment were conducted using synthetic DNA and nucleic acids extracted from SARS-CoV-2 positive and negative patients. Total of 1,000 individuals tested: 667 'healthy' individuals and 333 infection-suspected patients with cough and fever.</li> <li>• By screening with pooling strategy by end of April, 2020, there are 12 COVID-19 patients in 333 infection suspected patients (3.6%) and zero in 667 'healthy'. Results obtained with total running 538 times (instead of 1,000 times) by pooling strategy.</li> <li>• Pooling samples is feasible for saving test reagents and detecting SARS-CoV-2 in clinical setting to prevent the spread of the virus and nosocomial transmission.</li> </ul> |
| 01.05.2020 | <a href="#">Early phases of COVID-19 are characterized by a reduction of lymphocyte populations and the presence of atypical monocytes</a>                                 | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• Study evaluated the peripheral blood mononuclear cells profile of 63 patients with COVID-19 at diagnosis and presence of association with inflammatory biomarkers and 28-days mortality</li> <li>• Patients who died within 28 days from admission (N=10, 15.9%) displayed</li> </ul>   |

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|            |  |                                       | <p>lower mean values of CD3+ (p=0.028) and CD4+ cells (p=0.042) and higher mean percentages of CD8+/CD38+/HLA-DR+ lymphocytes (p=0.026).</p> <ul style="list-style-type: none"> <li>• The early phases of COVID-19 are characterized by lymphocytopenia, predominance of Th2 lymphocytes and less immunocompetent monocytes, which include atypical mononuclear cells.</li> </ul>  |
| 27.04.2020 | <a href="#">In silico design and validation of commercial kit GPS™ CoVID-19 dtec-RT-2 qPCR Test under criteria of UNE/EN ISO 17025:2005 and ISO/IEC 15189:2012</a> | bioRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• The present study approached the in silico specificity of the GPSTM CoVID-19 dtec-RT-qPCR Test and RT-qPCR designs currently published.</li> <li>• Diagnostic validation was achieved by two independent reference laboratories, the Instituto de Salud Carlos III (ISCIII), (Madrid, Spain) and Public Health England (PHE; Colindale, London, UK).</li> <li>• The GPSTM RT-qPCR primers and probe showed the highest number of mismatches with the closet related non-SARS-CoV-2 coronavirus, including some indels. The kits passed all parameters of validation with strict acceptance criteria.</li> </ul> |

## Genomics

| Publication Date | Title/URL   | Digest                          | Journal  |
|------------------|---|---------------------------------|--|
| 06.05.2020       | <a href="#">SARS-CoV-2 viral spike G614 mutation exhibits higher case fatality rate</a> | Int J Clin Pract / short report | <ul style="list-style-type: none"> <li>• The results imply that a mutation on the SARS-CoV-2 viral envelope spike protein, which is responsible for virus attachment to the host (G614) is a more pathogenic strain of SARS-CoV-2, which may influence vaccine design.</li> </ul>  |
| 16.04.2020       | <a href="#">Genomic characterization of a novel SARS-CoV-2</a>                          | Gene Reports / Article          | <ul style="list-style-type: none"> <li>• The study analysed 95 SARS-CoV-2 complete genome sequences available in GenBank, National Microbiology Data Centre (NMDC) and NGDC Genome Warehouse from December-2019 until 05 of April-2020. Of 116 mutations, the three most common mutations were 8782C&gt;T in ORF1ab gene, 28144T&gt;C in ORF8 gene and 29095C&gt;T in the N gene.</li> </ul> |

## Epidemiology and clinical - children and pregnancy

| Publication Date | Title/URL  | Digest                         | Journal  |
|------------------|--|--------------------------------|--|
| 06.05.2020       | <a href="#">Chilblains-like lesions in children following suspected Covid-19 infection</a> | Pediatr Dermatol / Case report | <ul style="list-style-type: none"> <li>• During the COVID-19 pandemic, chilblains-like lesions have been reported in mildly symptomatic children and adolescents.</li> <li>• The authors present four children investigated for suspected COVID-19 infection who presented with acral skin findings and mild systemic</li> </ul> |

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|            |  |                                       | symptoms. Histology from one case showed signs of vasculitis with evident fibrin thrombus.  |
| 20.04.2020 | <a href="#">Pulmonary embolism in a young pregnant woman with COVID-19</a>   | Thromb Res / Letter                   | <ul style="list-style-type: none"> <li>• Case study of pulmonary embolism in a 17-year-old obese woman (BMI 32 Kg/m<sup>2</sup>) with COVID-19 presenting with fever, mild dyspnoea and rhinitis at 29 weeks of gestation.</li> </ul>   |
| 05.05.2020 | <a href="#">Pregnancy outcomes, Newborn complications and Maternal-Fetal Transmission of SARS-CoV-2 in women with COVID-19: A systematic review of 441 cases</a> | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• The aim of this systematic review was to examine published and preprint reports for maternal and foetal outcomes in pregnant women with COVID-19 and also assess the incidence of maternal-foetal transmission of SARS CoV-2 infection.</li> <li>• Included 23 studies [China (20), USA (01), Republic of Korea (01) and Honduras, Central America (01) reporting information on 172 pregnant women and 162 neonates.</li> <li>• Pregnancy complications included delivery by caesarean section (89%), preterm labour (21%), foetal distress (9%) and premature rupture of membranes (8%); amongst the neonates of COVID-19 mothers, preterm birth (23%), respiratory distress syndrome (14%), pneumonia (14%) low birth weight (11%), small for gestational age (3%) were reported.</li> <li>• There were four neonatal deaths reported.</li> </ul> |
| 30.04.2020 | <a href="#">First case of placental infection with SARS-CoV-2</a>  | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• The authors analysed placenta for the presence of SARS-CoV-2 through molecular and immunohistochemical assays and by electron microscopy, and measured the maternal antibody response in blood to this infection.</li> <li>• SARS-CoV-2 localized predominantly to syncytiotrophoblast cells at the maternal-foetal interface of the placenta; histological examination of the placenta revealed a dense macrophage infiltrate, but no evidence for vasculopathy typically associated with preeclampsia.</li> <li>• This case demonstrates, for the first time, SARS-CoV-2 invasion of the placenta.</li> </ul>  |

#### Epidemiology and clinical - risk factors

| Publication Date | Title/URL  | Digest             | Journal   |
|------------------|--|--------------------|---|
| 28.04.2020       | <a href="#">Scoping review of prevalence of neurologic comorbidities in patients hospitalized for COVID-19</a> | Neurology / Review | <ul style="list-style-type: none"> <li>• Among screened articles, 322 of 4,014 (8.0%) of hospitalized patients diagnosed and treated for COVID-19 had a pre-existing neurologic illness. Four retrospective studies demonstrated an increased risk of secondary neurologic complications in hospitalized patients with COVID-19 (incidence</li> </ul> |

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|            |  |   | of 6%, 20% and 36.4%, respectively). Inconsistent reporting and limited statistical analysis among these studies did not allow for assessment of comparative outcomes.  |
| 19.04.2020 | <a href="#">Cardiac injury is associated with mortality and critically ill pneumonia in COVID-19: A meta-analysis</a>  | The American journal of emergency medicine / Meta-analysis    | <ul style="list-style-type: none"> <li>• Systematic review and meta-analysis exploring the association between cardiac injury and mortality, the need for ICU care, ARDS, and severe COVID-19.</li> <li>• This meta-analysis of 2389 patients from 13 studies showed that cardiac injury is associated with mortality, need for ICU care, and severity of disease in patients with COVID-19.</li> </ul>   |
| 04.05.2020 | <a href="#">Sex Differences in Mortality from COVID-19 Pandemic: Are Men Vulnerable and Women Protected?</a>   | JACC Case Rep / Global health report                          | <ul style="list-style-type: none"> <li>• Global data suggests that is a sex difference in mortality from COVID-19. In this report, the authors explore plausible reasons for this sex difference including the contribution of underlying cardiovascular risk factors, high risk behaviours, immune response and biological differences between men and women.</li> </ul>   |
| 06.05.2020 | <a href="#">Risk factors for disease progression in hospitalized patients with COVID-19: a retrospective cohort study</a>  | Infect Dis (Lond) / Article                                   | <ul style="list-style-type: none"> <li>• Retrospective study on the risk factors for disease progression of 101 cases with COVID-19, where disease progression occurred in 17 patients, 84 patients improved, 6 were transferred to intensive care unit (ICU), and 5 died.</li> <li>• Older age increased CRP and decreased lymphocyte count resulted in potential risk factors for COVID-19 progression. This may be helpful in identifying patients whose condition worsens at an early stage.</li> </ul>   |
| 12.04.2020 | <a href="#">Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan</a>  | Journal of allergy and clinical immunology / Article in press | <ul style="list-style-type: none"> <li>• This study identified 269 severe cases on hospital admission.</li> <li>• Patients with elder age, hypertension, and high LDH level need careful observation and early intervention to prevent the potential development of severe COVID-19. Severe male patients with heart injury, hyperglycaemia, and high-dose corticosteroid use may have high risk of death.</li> </ul>   |
| 30.04.2020 | <a href="#">Incidence of COVID-19 in a cohort of adult and paediatric patients with rheumatic diseases treated with targeted biologic and synthetic disease-modifying anti-rheumatic drugs</a> | medRxiv (not peer reviewed) / Article                         | <ul style="list-style-type: none"> <li>• Investigated the incidence of COVID-19 in a cohort of adult and paediatric patients with rheumatic diseases in a large rheumatology tertiary centre in Barcelona, Spain, receiving targeted biologic and synthetic disease modifying anti-rheumatic drugs (tDMARDs) and to explore the possible effect of these treatments in the clinical expression of COVID-19.</li> <li>• Adult and paediatric patients with rheumatic diseases on tDMARDs do not seem to present a higher risk of COVID-19 or a more severe disease outcome when compared to general population.</li> </ul> |
| 29.04.2020 | <a href="#">Pre-Existing Characteristics Associated with Covid-19 Illness Severity</a>   | medRxiv (not peer reviewed) / Article                         | <ul style="list-style-type: none"> <li>• This retrospective observational study curated data from the electronic health record in a large, multihospital healthcare system in Southern California., and used multivariable logistic regression to examine the association of pre-existing traits with a Covid-19 illness severity defined by</li> </ul>   |

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|            |   |                          | <p>level of required care.</p> <ul style="list-style-type: none"> <li>• Of 442 patients studied, 48% required hospitalization, 17% required intensive care, and 12% required intubation.</li> <li>• Greater Covid-19 illness severity was seen in patients who are older, male, African American, obese, with diabetes, and with greater overall comorbidity burden; certain comorbidities augment risk to a greater extent in younger patients; in hospitalized patients, male sex is the main determinant of needing more intensive care.</li> </ul> |
| 06.05.2020 | <a href="#">Pneumomediastinum following intubation in COVID-19 patients: a case series</a>                        | Anaesthesia / Article    | <ul style="list-style-type: none"> <li>• The authors thoracic surgery department (Guy's Hospital, London) has seen an increased incidence of severe pneumomediastinum referred for surgical opinion in intubated patients with COVID-19 pneumonitis.</li> <li>• Here they present a series of five cases of severe pneumomediastinum requiring decompression therapy over a 7-day period in the current COVID-19 outbreak.</li> </ul>  |
| 06.05.2020 | <a href="#">Autopsy Findings and Venous Thromboembolism in Patients With COVID-19: A Prospective Cohort Study</a> | Ann Intern Med / Article | <ul style="list-style-type: none"> <li>• Compared clinical findings with data from medical autopsy, virtual autopsy, and virologic tests results from 12 deceased COVID-19 patients.</li> <li>• Concluded that the high incidence of thromboembolic events suggests an important role of COVID-19–induced coagulopathy.</li> </ul>   |

#### Epidemiology and clinical – other

| Publication Date | Title/URL  | Digest   | Journal  |
|------------------|--|--|--|
| 06.05.2020       | <a href="#">Acute Cor Pulmonale in Critically Ill Patients with Covid-19</a>                                   | New England Journal of Medicine / Correspondence | <ul style="list-style-type: none"> <li>• Case series of 5 patients presenting to ICU. Four of the five patients had profound hemodynamic instability and cardiac arrest with acute right ventricular failure, and one had severe hemodynamic instability without cardiac arrest.</li> </ul>  |
| 06.05.2020       | <a href="#">COVID-19-associated nephritis: early warning for disease severity and complications?</a>           | The Lancet / Correspondence                      | <ul style="list-style-type: none"> <li>• At one hospital, abnormalities were identified in the urine samples of patients with COVID-19 who became sick within a few days.</li> <li>• On the basis of these findings, the authors generated an algorithm for early detection of COVID-19-associated nephritis and to assess the risk of respiratory decompensation by capillary leak syndrome.</li> </ul> |
| 06.05.2020       | <a href="#">Effective transmission across the globe: the role of climate in COVID-19 mitigation strategies</a> | The Lancet Planetary Health / Correspondence     | <ul style="list-style-type: none"> <li>• The ability of SARS-CoV-2 to effectively spread globally, suggests that seasonality cannot be considered a key modulating factor of SARS-CoV-2 transmissibility.</li> <li>• Although warmer weather might slightly reduce transmission of SARS-CoV-2, no evidence has suggested that warmer conditions will reduce the</li> </ul>                               |

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|            |  |   | effectiveness of SARS-CoV-2 transmission to an extent that few additional interventions are needed to curb its spread.  |
| 01.05.2020 | <a href="#">SARS-COV-2 was already spreading in France in late December 2019</a>   | Int J Antimicrob Agents / Short communication | <ul style="list-style-type: none"> <li>• Report of the case of a patient hospitalized in Dec 2019 in Paris, for haemoptysis with no etiological diagnosis and for which RT-PCR was performed retrospectively on the stored respiratory sample which confirmed the diagnosis of COVID-19 infection.</li> <li>• Based on this result, it appears that the COVID-19 epidemic started much earlier than late Jan 2020 as believed thus far.</li> </ul>  |
| 01.05.2020 | <a href="#">Time from Symptom Onset to Hospitalisation of Coronavirus Disease 2019 (COVID-19) Cases: Implications for the Proportion of Transmissions from Infectors with Few Symptoms</a> | J Clin Med / Article                          | <ul style="list-style-type: none"> <li>• Study showing that the proportion of infections arising from hosts with few symptoms at the start of an outbreak can, in combination with the basic reproduction number, indicate whether or not interventions targeting symptomatic hosts are likely to be effective.</li> <li>• However, a high proportion of infections from hosts with few symptoms after the initial stages of an outbreak is only problematic if the rate of new infections remains high. Otherwise, it can simply indicate that symptomatic transmissions are being prevented successfully. This should be considered when interpreting estimates of the extent of transmission from hosts with few COVID-19 symptoms.</li> </ul> |
| 05.05.2020 | <a href="#">Rapid implementation of mobile technology for real-time epidemiology of COVID-19</a>   | Science / Report                              | <ul style="list-style-type: none"> <li>• Describes the COVID-19 Symptom Tracker mobile application that was launched in the UK on Mar 24, 2020 and the US on Mar 29, 2020, developed by the COronavirus Pandemic Epidemiology (COPE) consortium.</li> <li>• This initiative offers critical proof-of-concept for the repurposing of existing approaches to enable rapidly scalable epidemiologic data collection and analysis which is critical for a data-driven response to this public health challenge.</li> </ul>  |
| 05.05.2020 | <a href="#">Clinicopathological characteristics of 8697 patients with COVID-19 in China: a meta-analysis</a>   | Fam Med Community Health / Review             | <ul style="list-style-type: none"> <li>• A total of 55 unique retrospective studies involving 8697 patients with COVID-19 were identified.</li> <li>• The most commonly experienced symptoms of patients with COVID-19 were fever and cough. Myalgia, anorexia, chest tightness and dyspnoea were found in some patients.</li> <li>• A relatively small percentage of patients were asymptomatic and could act as carriers of the disease.</li> </ul>   |
| 01.05.2020 | <a href="#">Internet Search Patterns Reveal Clinical Course of Disease Progression for COVID-19 and Predict Pandemic Spread in 32 Countries</a>  | medRxiv (not peer reviewed) / Article         | <ul style="list-style-type: none"> <li>• Conducted a detailed global study of Internet search patterns related to COVID-19 symptoms in multiple languages across 32 countries on six continents.</li> <li>• Reveal a robust temporal pattern of disease progression for COVID-19: Initial symptoms of fever, dry cough, sore throat and chills are followed by shortness of breath an average of 5.22 days after symptom onset, matching</li> </ul>   |

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|            |  |  | <p>the precise clinical course reported in the medical literature.</p> <ul style="list-style-type: none"> <li>Increases in COVID-19-symptom-related searches predict increases in reported COVID-19 cases and deaths 18.53 days and 22.16 days in advance, respectively.</li> <li>Data can be used to track and predict the local spread of COVID-19 before widespread laboratory testing becomes available in each country, helping to guide the current public health response.</li> </ul>  |
| 30.04.2020 | <a href="#">Sex-specific differences in COVID-19 testing, cases and outcomes: a population-wide study in Ontario, Canada</a>   | medRxiv (not peer reviewed) / Article  | <ul style="list-style-type: none"> <li>Report on 194,372 unique residents received COVID-19 testing between Jan 23 - April 28, 2020. More women tested but men had higher rate of infection, hospitalization, ICU admission and death.</li> <li>Findings consistent when age adjusted, suggesting observed differences in outcomes not explained by age or systematic differences in testing by sex. May be due to sex-based immunological or other gendered differences, such as higher rates of smoking leading to cardiovascular disease.</li> </ul> |
| 05.05.2020 | <a href="#">Ultrastructural Evidence for Direct Renal Infection with SARS-CoV-2</a>  | J Am Soc Nephrol / Rapid communication | <ul style="list-style-type: none"> <li>The cause of kidney injury in COVID-19 is unclear, in an autopsy study of a single patient with COVID-19 and acute oliguric renal failure, the authors identified intracellular viral arrays within proximal tubular epithelial cells by electron microscopy, consistent with direct infection of the kidney by SARS-CoV-2.</li> </ul>   |
| 06.05.2020 | <a href="#">Fulminant Acute Kidney Injury in a Young Patient with Novel Coronavirus 2019</a>   | Cardiorenal Med / Case report          | <ul style="list-style-type: none"> <li>Report of a patient with COVID-19 who presented with acute onset of symptoms and normal renal function at baseline but rapidly deteriorated resulting in death.</li> </ul>   |
| 06.05.2020 | <a href="#">Arterial thromboembolic complications in COVID-19 in low risk patients despite prophylaxis</a>   | Br J Haematol / Letter                 | <ul style="list-style-type: none"> <li>Present a case series of three patients with COVID-19 who developed arterial vascular complications, one who developed an acute CVA, one who developed popliteal artery occlusion and one who developed both during their hospital course.</li> </ul>  |
| 06.05.2020 | <a href="#">Autoimmune hemolytic anemia associated with Covid-19 infection</a>   | Br J Haematol / Letter                 | <ul style="list-style-type: none"> <li>In this report the authors describe 7 patients from 6 French and Belgian Hospitals who developed a first episode of autoimmune haemolytic anaemia (AIHA) during a Covid-19 infection.</li> </ul>   |
| 15.08.2020 | <a href="#">Computational analysis of SARS-CoV-2/COVID-19 surveillance by wastewater-based epidemiology locally and globally: Feasibility, economy, opportunities and challenges</a> | Sci Total Environ / Article            | <ul style="list-style-type: none"> <li>Wastewater was computationally examined as a matrix for detection of SARS-CoV-2.</li> <li>One infected individual theoretically is detectable among 100 to 2,000,000 persons.</li> <li>Temperature and in-sewer travel time severely impact virus detectability.</li> <li>2.1 billion people could be monitored globally in 105,600 sewage treatment plants.</li> </ul>  |

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| 12.04.2020 | <a href="#">Evaluation of lockdown impact on SARS-CoV-2 dynamics through viral genome quantification in Paris wastewaters</a> | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• A time-course quantitative analysis of SARS-CoV-2 by RT-qPCR in raw wastewater samples from Parisian major wastewater treatment plant (WWTP).</li> <li>• Increase of genome units in raw wastewaters accurately followed increase of human COVID-19 cases at regional level. Marked decrease concomitantly with reduction in cases with lockdown.</li> <li>• Suggests quantitative monitoring of SARS-CoV-2 genomes in wastewaters brings information for an improved survey of SARS-CoV-2 circulation at the local or regional scale.</li> </ul> |
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### Infection control

| Publication Date | Title/URL   | Digest                             | Journal   |
|------------------|---|------------------------------------|---|
| 06.05.2020       | <a href="#">Infection prevention and control compliance in Tanzanian outpatient facilities: a cross-sectional study with implications for the control of COVID-19</a> | The Lancet Global Health / Article | <ul style="list-style-type: none"> <li>• This study was based on a secondary analysis of cross-sectional data collected as part of a randomised controlled trial in private for-profit dispensaries and health centres and in faith-based dispensaries, health centres, and hospitals, in 18 regions.</li> <li>• Health worker infection prevention and control compliance, particularly for hand hygiene and disinfection, was inadequate in these outpatient settings.</li> </ul> |
| 03.04.2020       | <a href="#">Respiratory virus shedding in exhaled breath and efficacy of face masks</a>   | Nat Med / brief communication      | <ul style="list-style-type: none"> <li>• Surgical face masks significantly reduced detection of influenza virus RNA in respiratory droplets and coronavirus RNA in aerosols, with a trend toward reduced detection of coronavirus RNA in respiratory droplets.</li> <li>• The results indicate that surgical face masks could prevent transmission of human coronaviruses and influenza viruses from symptomatic individuals.</li> </ul>  |

### Treatment

| Publication Date | Title/URL  | Digest  | Journal   |
|------------------|--|---|---|
| 06.05.2020       | <a href="#">Emergency Use Authorization of remdesivir by the US Food and Drug Administration</a> | European Centre For Disease Control and Prevention / Update | <ul style="list-style-type: none"> <li>• On 1 May the US Food and Drug Administration (FDA) announced that it had issued Emergency Use Authorization (EUA) for the use of remdesivir in treating COVID-19.</li> </ul> |
| 06.05.2020       | <a href="#">Testing COVID-19 therapies to prevent progression of mild disease</a>                | The Lancet Infectious Diseases / Correspondence             | <ul style="list-style-type: none"> <li>• Even though lopinavir-ritonavir might not be efficacious in cases of severe COVID-19, the authors postulate that similar treatments to these antivirals,</li> </ul>          |

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|            |   |  | which also effectively inhibit viral replication, will be more effective in preventing disease progression if used to treat mild disease than if used to treat severe disease.  |
| 05.05.2020 | <a href="#">COVID-19 infection in a patient with multiple sclerosis treated with fingolimod</a>   | Neurol Neuroimmunol Neuroinflamm / Case report | <ul style="list-style-type: none"> <li>• Case report of a patient with Multiple sclerosis (MS) treated with fingolimod who was diagnosed with COVID-19 and had a favourable outcome.</li> <li>• MS patients who are on long-term treatment with immunotherapies may be particularly at risk of severe COVID-19.</li> </ul>  |
| 05.05.2020 | <a href="#">Impact of corticosteroid therapy on outcomes of persons with SARS-CoV-2, SARS-CoV, or MERS-CoV infection: a systematic review and meta-analysis</a>     | Leukemia / Systematic review                   | <ul style="list-style-type: none"> <li>• Systematic review and meta-analysis of 11 reports including 10 cohort studies and 1 randomized clinical trial involving 5249 subjects (2003-2020).</li> <li>• Corticosteroid use in subjects with SARS-CoV-2, SARS-CoV, and MERS-CoV infections delayed virus clearing and did not convincingly improve survival, reduce hospitalization duration or ICU admission rate and/or use of mechanical ventilation. There were several adverse effects.</li> </ul> |
| 29.04.2020 | <a href="#">Clinical Outcomes and Plasma Concentrations of Baloxavir Marboxil and Favipiravir in COVID-19 Patients: an Exploratory Randomized, Controlled Trial</a> | medRxiv (not peer reviewed) / Article          | <ul style="list-style-type: none"> <li>• The authors conducted an exploratory trial with 3 arms involving hospitalized adult patients with COVID-19; patients were randomized assigned in a 1:1:1 ratio into baloxavir marboxil group, favipiravir group, and control group.</li> <li>• The findings do not support adding either baloxavir or favipiravir under the trial dosages to the existing standard treatment</li> </ul>  |

## Social sciences

| Publication Date | Title/URL   | Digest   | Journal  |
|------------------|---|--|--|
| 30.04.2020       | <a href="#">Letter to the editor: Evidence on school closure and children's social contact: useful for coronavirus disease (COVID-19)?</a>                                | Euro Surveill / letter                             | <ul style="list-style-type: none"> <li>• Letter discussing mental health of children and adolescents following school closure, with increased risk of loneliness, addiction to videogames and binge watching, alteration of circadian rhythms, direct or assisted domestic violence, and academic achievement gaps.</li> </ul>   |
| 02.05.2020       | <a href="#">A Nationwide Survey of Psychological Distress among Italian People during the COVID-19 Pandemic: Immediate Psychological Responses and Associated Factors</a> | Int J Environ Res Public Health / Research article | <ul style="list-style-type: none"> <li>• Study aiming to establish the prevalence of psychiatric symptoms and identify risk and protective factors for psychological distress in the general Italian population.</li> <li>• Female gender, negative affect, and detachment were associated with higher levels of depression, anxiety, and stress. Having an acquaintance infected was associated with 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.</li> </ul> |

- Finally, those with a family member infected and young person who had to work outside their domicile presented higher levels of anxiety and stress, respectively.

## Modelling

| Publication Date | Title/URL  | Digest                                | Journal  |
|------------------|--|---------------------------------------|--|
| 30.04.2020       | <a href="#">Effect of Alert Level 4 on effective reproduction number: review of international COVID-19 cases</a>   | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• Analysed case data from 25 international locations to estimate their effective reproduction number, <math>R_{eff}</math> values over time and to assess the effectiveness of interventions for reducing transmission.</li> <li>• Results show strong interventions, equivalent to NZ's Alert Level 3 or 4, successful at reducing <math>R_{eff}</math> below threshold for outbreak; generally managed to maintain case numbers at lower levels.</li> <li>• Predictions from such models are important for informing policy and decisions on intervention timing and stringency during the pandemic.</li> </ul>                 |
| 01.05.2020       | <a href="#">Impact of non-pharmaceutical interventions against COVID-19 in Europe: a quasi-experimental study</a>  | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• Report a quasi-experimental study of the impact of various interventions for control of the outbreak. Primary analyses modelled in R using Bayesian generalised additive mixed models (GAMM).</li> <li>• Closure of education facilities, prohibiting mass gatherings and closure of some non-essential businesses associated with reduced incidence whereas stay at home orders, closure of all non-businesses and requiring the wearing of facemasks or coverings in public was not associated with any independent additional impact.</li> <li>• Results could help inform strategies for coming out of lockdown.</li> </ul> |
| 01.05.2020       | <a href="#">Associations of stay-at-home order and face-masking recommendation with trends in daily new cases and deaths of laboratory-confirmed COVID-19 in the United States</a> | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• Piecewise log-linear modelling of temporal trends with turning-points, followed by quasi-experimental study on trend turning-point.</li> <li>• Two turning points of U.S COVID-19 daily new cases or deaths appear to associate with implementation of stay-at-home order (SAHO) and CDC face-masking recommendation. Simulation on early-implementation and removal of SAHO reveals considerable impact on COVID-19 daily new cases and deaths.</li> </ul>   |
| 01.05.2020       | <a href="#">The reproduction number of COVID-19 and its correlation with public health interventions</a>   | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• Study explores effectiveness of political interventions using the reproduction number of COVID-19 across Europe - via a dynamic SEIR epidemiology model with a time-varying reproduction number, identified using machine learning and uncertainty quantification.</li> <li>• During early outbreak, reproduction number was <math>4.5+/-21.4</math>, with</li> </ul>   |

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|            |  |                                       | <p>maximum values of 6.5 and 5.9 in Spain and France. Now dropped to 0.7+/-20.2, with minimum values of 0.4 and 0.3 in Austria and France.</p> <ul style="list-style-type: none"> <li>• Strong correlation between passenger air travel and reproduction number with a time delay of 12.6+/-22.7 days. New dynamic SEIR model provides the flexibility to simulate various outbreak control and exit strategies to inform political decision making and identify safe solutions in the benefit of global health.</li> </ul>   |
| 03.05.2020 | <a href="#">The importance of the timing of quarantine measures before symptom onset to prevent COVID-19 outbreaks - illustrated by Hong Kong's intervention model</a> | medRxiv (not peer reviewed) / Article | <ul style="list-style-type: none"> <li>• Two-layered susceptible-exposed-infectious-quarantined-recovered (SEIQR) meta-population model estimated the reproduction number of COVID-19 in Hong Kong was 0.76 (95% CI, 0.66 to 0.86), achieved through quarantining infected cases -0.57 days (95% CI, -4.21 - 3.88) relative to symptom onset, with an estimated incubation time of 5.43 days (95% CI, 1.30 - 9.47).</li> <li>• Quarantine start delayed by more than 1.43 day: reproduction number greater than one, making community spread more likely.</li> <li>• Results suggest that early quarantine for infected cases before symptom onset is a key factor to prevent COVID-19 outbreak.</li> </ul> |

#### Guidance, consensus statements and hospital resources

| Publication Date | Title/URL   | Digest                 |
|------------------|---|------------------------|
| 06.05.2020       | <a href="#">COVID-19 rapid guideline: acute kidney injury in hospital (NG175)</a> | NICE / Rapid guideline |

#### Overviews, comments and editorials

| Publication Date | Title/URL  | Digest   |
|------------------|--|--|
| 06.05.2020       | <a href="#">Racial Health Disparities and Covid-19 - Caution and Context</a>                               | N Engl J Med / Perspective                     |
| 06.05.2020       | <a href="#">CPR in the Covid-19 Era - An Ethical Framework</a>   | N Engl J Med / Perspective                     |
| 06.05.2020       | <a href="#">Rapid distribution of information by SMS-embedded video link to patients during a pandemic</a> | The Lancet Rheumatology / Comment              |
| 06.05.2020       | <a href="#">The immune system of children: the key to understanding SARS-CoV-2 susceptibility?</a>         | The Lancet Child & Adolescent Health / Comment |
| 05.05.2020       | <a href="#">Keeping Up With Emerging Evidence in (Almost) Real Time</a>                                    | Annals of Internal Medicine / Editorial        |
| 06.05.2020       | <a href="#">Health system quality in the time of COVID-19</a>  | The Lancet Global Health / Comment             |

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|------------|---|---|
| 06.05.2020 | <a href="#">Maintaining safety and service provision in human milk banking: a call to action in response to the COVID-19 pandemic</a> | The Lancet Child & Adolescent Health / Comment  |
| 06.05.2020 | <a href="#">COVID-19: underlying metabolic health in the spotlight</a>  | The Lancet Diabetes & Endocrinology / Editorial |
| 06.05.2020 | <a href="#">Privileges and Immunity Certification During the COVID-19 Pandemic</a>  | JAMA / Viewpoint                                |
| 06.05.2020 | <a href="#">The Ethics of COVID-19 Immunity-Based Licenses (“Immunity Passports”)</a>   | JAMA / Viewpoint                                |

**Produced by the PHE COVID-19 Literature Digest Team**

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