Public Health England

International EPI Cell Daily Evidence Digest – 23/04/2020

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Please note that we are including preprints (highlighted in red), which are preliminary reports of work that have NOT been peer-reviewed.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	Journal/ Article type	Digest
22.04.2020	First experience of COVID-19 screening of health-care workers in England	Lancet / Correspondence	• This testing protocol has enabled 1414 health-care workers to return more rapidly to NHS service in the past 3 weeks, the vast majority returning to direct patient care. • The authors speculate that testing might have additional positive

			effects on health behaviour, by providing health-care workers with the confidence that they can self-isolate with mild symptoms, knowing that a rapid negative result will enable them to return to work in a timely manner.
22.04.2020	Screening FMT donors during the COVID-19 pandemic: a protocol for stool SARS-CoV-2 viral quantification	Lancet Gastroenterology & Hepatology / Correspondence	• Only with enhanced donor screening and validated stool tests for SARS-CoV-2 can we ensure safe and effective delivery of faecal microbiota transplant (FMT) to critically ill patients with recurrent and refractory Clostridioides difficile infection.
22.04.2020	Alterations in smell or taste in mildly symptomatic outpatients with SARS-CoV2 infection	JAMA / Research letter	• Of 374 eligible patients, contact information was available for 283; 202 (71.4%) completed the telephone survey. • Alterations in smell or taste were frequently reported by mildly symptomatic patients with SARS-CoV-2 infection and often were the first apparent symptom.
22.04.2020	Acute-onset smell and taste disorders in the context of Covid-19: a pilot multicenter PCR-based case-control study	European journal of neurology / Short communication	• New-onset smell/taste disorders were significantly more frequent among Covid-19 patients than influenza patients, they usually had an acute onset and were commonly an initial manifestation.
22.04.2020	Preparedness and Rapid Implementation of External Quality Assessment Helped Quickly Increase COVID-19 Testing Capacity in the Republic of Korea	Clinical chemistry / Accepted manuscript	• Details the steps taken and external quality assessment that supported rapid expansion of testing capacity in the Republic of Korea.
21.04.2020	Saliva as a non-invasive specimen for detection of SARS-CoV-2	Journal of clinical microbiology / Letter to the editor	• Between 25th Mar and 1st Apr 2020, 622 patients were tested for COVID-19 through the screening clinic (Australia). All patients had nasopharyngeal swabs (NPS), and 522/622 (83.9%) patients also provided saliva. Patients were asked to pool saliva in their mouth for 1-2 minutes prior to collection, and gently spit 1-2 mL of saliva into a 25mL collection pot. • Although the sensitivity of saliva as a diagnostic specimen is less than NPS, saliva testing may be a suitable alternative first-line screening test in several environments, including low resource settings, with NPS reserved for patients with an ongoing high clinical index of suspicion.
17.04.2020	Saliva Sample as a Non-Invasive Specimen for the Diagnosis of Coronavirus Disease-2019 (COVID-19): a Cross-Sectional Study	medRxiv (not peer reviewed) / Article	• Concluded that saliva specimens can be used for the diagnosis of COVID-19. The collection method is non-invasive, and non-aerosol generating. Using a saliva sample as a specimen for the detection of SARS-CoV-2 could facilitate the diagnosis of the disease, which is one of the strategies that helps in controlling the epidemic.
16.04.2020	Saliva is more sensitive for SARS-CoV-2 detection in COVID-19 patients than nasopharyngeal swabs	medRxiv (not peer reviewed) / Article	• When the authors compared SARS-CoV-2 detection from patient-matched nasopharyngeal and saliva samples, they found that saliva yielded greater detection sensitivity and consistency throughout the

Date	Title	Source / Type	Summary
			course of infection. Furthermore, they report less variability in self-sample collection of saliva. • Taken together, their findings demonstrate that saliva is a viable and more sensitive alternative to nasopharyngeal swabs and could enable at-home self-administered sample collection for accurate large-scale SARS-CoV-2 testing.
17.04.2020	Comparison of Four Molecular In Vitro Diagnostic Assays for the Detection of SARS-CoV-2 in Nasopharyngeal Specimens	medRxiv (not peer reviewed) / Article	• In the present study, the authors have evaluated the analytical sensitivity and clinical performance of four SARS-CoV-2 molecular diagnostic assays granted Emergency Use Authorization by the FDA using nasopharyngeal swabs from symptomatic patients. This information is crucial for both laboratories and clinical teams, as decisions on which testing platform to implement are made.
21.04.2020	Validation of the Hologic's Aptima Unisex and Multitest Specimen collection kits used for Endocervical and Male Urethral Swab Specimen (Aptima Swab) for sample collection of SARS-CoV-2	Journal of clinical microbiology / Article	• The results indicate that the Aptima swab collection and transport device appears to be an appropriate system for collection of samples from SARS-CoV-2 infected patients.
22.04.2020	Anti-SARS-CoV-2 virus antibody levels in convalescent plasma of six donors who have recovered from COVID-19	Aging / Research paper	• This study's serological findings in convalescent plasma from recovered patients may help facilitate understanding of the SARS-CoV-2 infection and establish CP donor screening protocol in COVID-19 outbreak.
22.04.2020	Evaluation of the auxiliary diagnostic value of antibody assays for the detection of novel coronavirus (SARS-CoV-2)	Journal of medical virology	• Findings indicate that antibody detection could be used as an effective supplementary indicator of SARS-CoV-2 infection in suspected cases with no detectable viral RNA, and in conjunction with nucleic acid detection in confirming infection.
21.04.2020	Lung Ultrasound in Children With COVID-19	Pediatrics / preprint	• This study represents a preliminary report of lung ultrasound characteristics in children affected by COVID-19. While the number of patients analysed is small, the high concordance between radiologic and LUS findings suggests that ultrasound may be a reasonable method to detect lung abnormalities in children with COVID-19.
17.04.2020	AI-Driven CT-based quantification, staging and short-term outcome prediction of COVID-19 pneumonia	medRxiv (not peer reviewed) / Article	• The objective of this study was to address prediction of short-term outcomes, especially the need for mechanical ventilation. In this multi-centric study, they propose an end-to-end artificial intelligence solution for automatic quantification and prognosis assessment by combining automatic CT delineation of lung disease meeting the performance of experts and data-driven identification of biomarkers for its prognosis. • AI-driven combination of variables with CT-based biomarkers offers perspectives for optimal patient management given the shortage of intensive care beds and ventilators.

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17.04.2020	Distinguishing COVID-19 from influenza pneumonia in the early stage through CT imaging and clinical features	medRxiv (not peer reviewed) / Article	• Identified differences in CT imaging and clinical features between COVID-19 and influenza pneumonia in the early stage, and identified the most valuable features in the differential diagnosis. • Among a total of 1537 lesions and 62 imaging and clinical features, 26 features were demonstrated to be significantly different between COVID-19 and influenza pneumonia. The crazy-paving pattern was recognized as the most powerful imaging feature for the differential diagnosis in the early stage, while WBC count yielded the highest diagnostic efficacy in clinical manifestations.
21.04.2020	Imaging characteristics of initial chest computed tomography and clinical manifestations of patients with COVID-19 pneumonia	Japanese journal of radiology / Article	• This study investigated the chest CT imaging characteristics and clinical manifestations of patients with COVID-19 pneumonia (n=150). • The main manifestations of initial chest CT in COVID-19 pneumonia patients was ground-glass opacities, commonly involving single site in patients < 35 years old and multiple sites and extensive area in patients > 60 years old. The common lesion sites were the subpleural region and the posterior basal segments of the lower lobes, mostly showing thickening of the interlobular septum and mixed with consolidation.
17.04.2020	A Web-based, Mobile Responsive Application to Screen Healthcare Workers for COVID Symptoms: Descriptive Study	medRxiv (not peer reviewed) / Article	• Using rapid, agile development, the authors quickly created and deployed a dedicated employee attestation application that gained widespread adoption and use within their health system. Further, they have identified over 500 symptomatic employees that otherwise would have possibly come to work, potentially putting others at risk. They share the story of their implementation, lessons learned, and source code (via GitHub) for other institutions who may want to implement similar solutions.

Genomics

Publication Date	Title/URL	Journal/ Article type	Digest
20.04.2020	Human monoclonal antibodies block the binding of SARS-CoV-2 spike protein to angiotensin converting enzyme 2 receptor	Cell Mol Immunol / Letter	• The authors have successfully cloned two human blocking mAbs using SARS-CoV-2 RBD-specific memory B cells isolated from recovered COVID-19 patients. These two mAbs can specifically bind to SARS-CoV-2 RBD, block the interaction between SARS-CoV-2 RBD and hACE2 receptor, and lead to efficient neutralization of SARS-CoV-2 S protein pseudotyped virus infection.

			• Such human anti-SARS-CoV-2 RBD-hACE2 blocking mAbs are first reported, and hold great promise to be exploited as specific prophylactic and therapeutic agents against ongoing SARS-CoV-2 pandemic.
18.04.2020	Significant expression of FURIN and ACE2 on oral epithelial cells may facilitate the efficiency of SARS-CoV-2 entry	bioRxiv (not peer reviewed) / Article	• In order to investigate the potential infective channel of new coronavirus in the oral cavity, the authors analysed the expression of ACE2 and FURIN that mediate the new coronavirus entry into host cells in oral mucosa using the public single-cell sequence datasets. • They speculated that SARS-CoV-2 could effectively invade oral mucosal cells though two possible routes: binding to the ACE2 receptor and fusion with cell membrane activated by FURIN protease. Their results indicated that oral mucosa tissues are susceptible to SARS-CoV-2.
19.04.2020	Identification of super-transmitters of SARS-CoV-2	medRxiv (not peer reviewed) / Article	• To probe the origin and transmission dynamics of this virus, the authors performed phylodynamic analysis of 247 high quality genomic sequences of viruses available in the GISAID platform as of Mar 05, 2020. • Four genetic clusters defined as Super-transmitters were found to become dominant and were responsible for the major outbreaks in various countries. • The identification of these super-transmitters provides insight into the control of further transmission of SARS-CoV-2.

Epidemiology and clinical - children and pregnancy

Publication Date	Title/URL	Journal/ Article type	Digest
22.04.2020	Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection in children and adolescents: A systematic review	JAMA Pediatrics / Systematic review	• A total of 815 articles were identified. Eighteen studies with 1065 participants (444 patients were younger than 10 years, and 553 were aged 10 to 19 years) with confirmed SARS-CoV-2 infection were included in the final analysis. • All articles reflected research performed in China, except for 1 clinical case in Singapore. • Children at any age were mostly reported to have mild respiratory symptoms, namely fever, dry cough, and fatigue, or were asymptomatic. Bronchial thickening and ground-glass opacities were the main radiologic features, and these findings were also reported in

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			asymptomatic patients. • Among the included articles, there was only 1 case of severe COVID-19 infection, which occurred in a 13-month-old infant. No deaths were reported in children aged 0 to 9 years.
22.04.2020	Late-onset neonatal sepsis with Covid-19	New England Journal of Medicine / Case report	• Although children are less likely than adults to have severe Covid-19, this case illustrates that it can occur and can be successfully managed with standard PICU protocols. • The one exception to the standard protocol was that non-invasive mechanical ventilation was not attempted, since Covid-19 was suspected.
22.04.2020	No SARS-CoV-2 detected in amniotic fluid in mid-pregnancy	Lancet Infectious Diseases / Correspondence	• Clinical records and laboratory results were retrospectively reviewed for two pregnant women with COVID-19 admitted to Wuhan Tongji Hospital (Wuhan, China) in the first trimester of pregnancy. • The study was limited by a small sample size and a lack of cord blood. However, the authors hope these findings will contribute to understanding of the potential for intrauterine vertical transmission of SARS-CoV-2 in early pregnancy.

Epidemiology and clinical - risk factors

Publication Date	Title/URL	Journal/ Article type	Digest
14.04.2020	ES23: COVID-19 rapid evidence summary: acute use of non-steroidal anti-inflammatory drugs (NSAIDs) for people with or at risk of COVID-19	NICE / Evidence summary	• The available evidence suggests that, although the anti-inflammatory effects of NSAIDs reduce acute symptoms (such as fever), they may either have no effect on, or worsen, long-term outcomes, possibly by masking symptoms of worsening acute respiratory tract infection.
22.04.2020	Two X-linked agammaglobulinemia patients develop pneumonia as COVID-19 manifestation but recover	Pediatric allergy and immunology / Original	• Report suggests that X linked agammaglobulinemia patients might present a high risk of developing pneumonia after SARS-Cov2 infection, but can recover from infection, suggesting that B cell response might be important, but not strictly required to overcome the disease.
22.04.2020	Obesity a Risk Factor for Severe COVID-19 Infection: Multiple Potential Mechanisms	Circulation / Article	• Discussion of the reasons why obesity is a risk factor for COVID-19, and what might be done in the future to prevent obesity through public health messaging.
21.04.2020	COVID-19-Related Severe Hypercoagulability in Patients Admitted	Thrombosis and haemostasis / Article	• Evaluated coagulation abnormalities via traditional tests and whole blood thromboelastometry profiles in a group of 22 (mean age 67 ± 8 years, M:F 20:2) consecutive patients admitted for acute respiratory

			failure due to COVID-19.
	to Intensive Care Unit for Acute Respiratory Failure		• Cases showed significantly higher fibrinogen and D-dimer plasma levels versus healthy controls. • COVID-19 patients with acute respiratory failure present a severe hypercoagulability rather than consumptive coagulopathy. Fibrin formation and polymerization may predispose to thrombosis and correlate with a worse outcome.
21.04.2020	The clinical data from 19 critically ill patients with coronavirus disease 2019: a single-centered, retrospective, observational study	Zeitschrift fur Gesundheitswissenschaften = Journal of public health	• A retrospective analysis of the clinical manifestation and auxiliary examination of 19 patients with COVID-19 from the Liyuan Hospital ICU between Jan 16, 2020 and Feb 20, 2020 was undertaken. • There were more men than women among critically ill patients. All of the cases showed ground-glass changes on chest CT and the vast majority of patients displayed fever and dry cough. The clinical laboratory indices change significantly, especially the D-dimer level among non-survivors.
18.04.2020	How many are at increased risk of severe COVID-19 disease? Rapid global, regional and national estimates for 2020	medRxiv (not peer reviewed) / Article	• The authors estimated the number of individuals at increased risk of severe COVID-19 disease by age (5-year age groups), sex and country (n=188) based on prevalence data from the Global Burden of Disease (GBD) study for 2017 and United Nations population estimates for 2020. • Based on current guidelines and prevalence data from GBD, they estimate that one in five individuals worldwide has a condition that is on the list of those at increased risk of severe COVID-19 disease. However, for many of these individuals the underlying condition will be undiagnosed or not severe enough to be captured in health systems, and in some cases the increase in risk may be quite modest.
16.04.2020	Impact of blood analysis and immune function on the prognosis of patients with COVID-19	medRxiv (not peer reviewed) / Article	• This retrospective study investigated the implications of changes in blood parameters and cellular immune function in patients with COVID-19. • For patients with COVID-19, lymphocyte, CD3+ and CD4+ counts that marked decrease suggest a poor outcome. A high neutrophil count is independently associated with mortality. At admission, leukocyte, neutrophil, lymphocyte, CD3+ and CD4+ counts should receive added attention.
16.04.2020	Cholesterol Metabolism--Impact for SARS-CoV-2 Infection Prognosis, Entry, and Antiviral Therapies	medRxiv (not peer reviewed) / Article	• The authors performed a retrospective study involving 861 patients with COVID-19 from a single-centre classified as mild, moderate, severe or critical. • The results not only identify the HDL level as a prognostic marker for

			SARS-CoV-2 infection, but also indicate a potential target for antiviral intervention.
17.04.2020	An ecological study of socioeconomic predictors in detection of COVID-19 cases across neighborhoods in New York City	medRxiv (not peer reviewed) / Article	• Investigated whether potential socioeconomic factors can explain between-neighbourhood variation in the number of detected COVID-19 cases. • These findings indicate associations between neighbourhoods with a large dependent population, those with a high proportion of males, and low-income neighbourhoods and detected COVID-19 cases. Given the elevated mortality in aging populations, the study highlights the importance of public health management during and after the current COVID-19 pandemic. Further work is warranted to fully understand the mechanisms by which these factors may have affected the number of detected cases, either in terms of the true number of cases or access to testing.
17.04.2020	Multivariate Analysis of Factors Affecting COVID-19 Case and Death Rate in U.S. Counties: The Significant Effects of Black Race and Temperature	medRxiv (not peer reviewed) / Article	• Using a large multivariate analysis, this study illuminates modulators of COVID-19 incidence and mortality in U.S. counties while controlling for risk factors across multiple domains. • U.S. counties with a higher proportion of Black residents are associated with increased COVID-19 cases and deaths. However, the various suggested mechanisms, such as socioeconomic and healthcare predispositions, did not appear to drive the effect of race in their model. Counties with higher average daily temperatures are also associated with decreased COVID-19 cases but not deaths. Several theories are posited to explain these findings, including prevalence of vitamin D deficiency. Additional studies are needed to further understand these effects.
16.04.2020	Evidence for probable aerosol transmission of SARS-CoV-2 in a poorly ventilated restaurant	medRxiv (not peer reviewed) / Article	• The authors analysed an outbreak involving three non-associated families in Restaurant X in Guangzhou, China, and assessed the possibility of aerosol transmission of SARS-CoV-2 and characterized the associated environmental conditions. The results show that the infection distribution is consistent with a spread pattern representative of exhaled virus-laden aerosols. • Aerosol transmission of SARS-CoV-2 due to poor ventilation may explain the community spread of COVID-19.
21.04.2020	Surveillance of coronavirus disease 2019 in general population using an online questionnaire: A report from 18161 respondents in China	JMIR public health and surveillance / Preprint	• Investigated whether an online survey can provide population-level information for observing prevalence trends during early phase of outbreak and identifying potential risk factors of COVID-19 infection. • Male sex, advanced age, and lung diseases were associated with a

			higher risk of fever in the general population with history of contact. This study shows the usefulness of an online questionnaire for surveillance of outbreaks like COVID-19 by providing information about trends of the disease and aiding in identifying potential risk factors.

Epidemiology and clinical – other

Publication Date	Title/URL	Journal/ Article type	Digest
22.04.2020	COVID-19 death data in England – update 22nd April	Centre for Evidence-Based Medicine, University of Oxford / Statistics	• Consistent with previous analyses, the peak day of deaths in England was the 8th of April. The structure of the data is similar across the regions, with the peak in London on the 4th of April, four days ahead of the rest of the country, the 8th of April.
22.04.2020	Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City Area	JAMA / Original Investigation	• A total of 5700 patients were included (median age, 63 years; 39.7% female). The most common comorbidities were hypertension (3026; 56.6%), obesity (1737; 41.7%), and diabetes (1808; 33.8%). • During hospitalization, 373 patients (14.2%) (median age, 68 years; 33.5% female) were treated in the intensive care unit care, 320 (12.2%) received invasive mechanical ventilation, 81 (3.2%) were treated with kidney replacement therapy, and 553 (21%) died.
22.04.2020	Is it safe for patients with COVID-19 to fast in Ramadan?	Oxford COVID-19 Evidence Service / Rapid review	• There is no evidence to suggest an adverse effect from fasting during the Covid-19 pandemic on asymptomatic healthy individuals who have previously fasted safely. • Prior to commencing fasting, any comorbidities need to be risk stratified and discussed with the patient's clinician. • The authors have developed a risk matrix spanning a range of conditions with a view to help patient-centred shared decision-making.
20.04.2020	Coronavirus Disease 19 (COVID-19) complicated with pneumonia in a patient with rheumatoid arthritis receiving conventional disease-modifying antirheumatic drugs	Rheumatol Int / Article	• Case report of a 61-year-old female rheumatoid arthritis patient. Treated with antiviral agents (lopinavir/ritonavir), and treatment with cDMARDs was discontinued except hydroxychloroquine. • Discharged after 3 weeks without any complications.
21.04.2020	A Case of SARS-CoV-2-pneumonia with successful antiviral therapy in a 77-year-old male with heart transplant	American journal of transplantation / Case report	• Present a 77-year old patient with a heart transplant under relevant immunosuppressive therapy who tested positive for SARS-CoV-2 after several days of dyspnoea, dry cough and light general symptoms. The CT-scan confirmed an interstitial pneumonia.

			• The patient received an antiviral therapy with hydroxychloroquine showing no further deterioration of the clinical state. After 12 days of hospitalisation the patient was released SARS-CoV-2 negative and completely asymptomatic.
21.04.2020	Clinical and Autoimmune Characteristics of Severe and Critical Cases with COVID-19	Clinical and translational science / Article	• The clinical, autoimmune, and laboratory characteristics of 21 patients who had laboratory-confirmed severe and critical cases of COVID-19 from the ICU ward of the Huangshi Central Hospital, China were investigated. A total of 21 patients (13 males and eight females) including eight (38.1%) severe cases and 13 (61.9%) critical cases were enrolled. • Autoimmune phenomena exists in COVID-19 subjects, and the results provide the rationale for a strategy of prevention of dysfunction of immune and optimal immunosuppressive therapy in the future.
21.04.2020	SARS-CoV-2 infection associated with spontaneous pneumothorax	CMAJ / Article	• Describes a 26-year-old man with SARS-CoV-2 infection showing a large pneumothorax and complete collapse of the affected right lung obtained on admission to hospital. • An association between COVID-19 and spontaneous pneumothorax has been described elsewhere, but its prognostic significance is not known.
21.04.2020	Early Description of Coronavirus 2019 Disease in Kidney Transplant Recipients in New York	Journal of the American Society of Nephrology / rapid communication	• Report 15 kidney transplant recipients from the Columbia University kidney transplant program who required hospitalization for confirmed COVID-19, and describe their management, clinical course, and outcomes. • Kidney transplant recipients with COVID-19 have presentations that are similar to that of the general population. Their current treatment protocol appears to be associated with favourable outcomes, but longer follow-up of a larger cohort of patients is needed.
21.04.2020	An elderly couple with COVID-19 pneumonia treated in Singapore: contrasting clinical course and management	Singapore Med J / Letter	• Describe the clinical illness of an elderly couple who are foreign nationals and who had travelled to Singapore on 9 March 2020. • Their experience using a risk-adapted treatment approach in the clinical management of this elderly couple with markedly different course of illness may shed light on the management of elderly patients diagnosed with COVID-19 infection.
21.04.2020	Cutaneous Clinico-Pathological Findings in three COVID-19-Positive Patients Observed in the Metropolitan Area of Milan, Italy	Acta Derm Venereol / Short communication	• Describe the clinical and histopathological features of 3 Italian patients with different cutaneous presentations of COVID-19 infection, observed and followed at the University of Milan.

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18.04.2020	Cluster of COVID-19 in northern France: A retrospective closed cohort study	medRxiv (not peer reviewed) / Article	• Conducted a retrospective closed cohort study among pupils, their parents and siblings, as well as teachers and non-teaching staff of a high-school located in Oise. Participants completed a questionnaire that covered history of fever and/or respiratory symptoms since 13 Jan 2020 and had blood tested for the presence of anti-SARS-CoV-2 antibodies. Of the 661 participants (median age: 37 years), 171 participants had anti-SARS-CoV-2 antibodies. • The relatively low infection attack rate observed in an area where SARS-CoV-2 actively circulated weeks before confinement measures indicates that establishing herd immunity will take time, and that lifting these measures in France will be long and complex.
19.04.2020	The Novel Coronavirus Disease (COVID-19): A PRISMA Systematic Review and Meta-analysis of Clinical and Paraclinical characteristics	medRxiv (not peer reviewed) / Systematic review	• Did a systematic review and meta-analysis using three databases to identify clinical, laboratory, and CT features of rRT-PCR confirmed cases of COVID-19. • Overall, the results showed that fever (84.2%, 95%CI 82.6-85.7), cough (62%, 95%CI 60-64), and fatigue (39.4%, 95%CI 37.2-41.6%) were the most prevalent symptoms in COVID-19 patients. Increased CRP level, decreased lymphocyte count, and increased D-dimer level were the most common laboratory findings. Among COVID-19 patients, 92% had a positive CT finding, most prevalently GGO (60%, 95%CI 58-62) and peripheral distribution (64%, 95%CI 60-69).
19.04.2020	Exit strategies: optimising feasible surveillance for detection, elimination and ongoing prevention of COVID-19 community transmission	medRxiv (not peer reviewed) / Article	• Australia is now close to the point of eliminating detectable community transmission of COVID-19. The authors aimed to develop an efficient, rapid and scalable surveillance strategy for detecting all remaining COVID-19 community transmission through exhaustive identification of every active transmission chain.

Infection control

Publication Date	Title/URL	Journal/ Article type	Digest
22.04.2020	What prognostic clinical risk prediction scores for COVID-19 are currently available for use in the community setting?	Oxford COVID-19 Evidence Service / Rapid review	• A number of clinical risk prediction scores have recently emerged that are currently available and methodologically suitable for use in the community following a potential infection with the SARS-CoV-2 virus causing COVID-19, or people with suspected or confirmed COVID-19.
22.04.2020	The prevalence, characteristics and prevention status of skin injury caused	Advances in wound care / Article	• The skin injuries among medical staff caused by PPE are serious, with insufficient prevention and treatment.

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	by personal protective equipment among medical staff in fighting COVID-19: A multi-center, cross-sectional study		
21.04.2020	Responding to the COVID-19 outbreak in Singapore: Staff Protection and Staff Temperature and Sickness Surveillance Systems	Clin Infect Dis / Article	• A total of 10,583 staff were placed on hospital-wide fever and sickness surveillance, with 1,524 frontline staff working in COVID-19 areas under close surveillance. Among frontline staff, a median of eight staff illness episodes was seen per day, and almost 10% (n=29) resulted in hospitalization. • A robust staff protection and health surveillance system that is routinely implemented during non-outbreak periods and enhanced during the COVID-19 outbreak is effective in protecting frontline staff from the infection.
22.04.2020	Respiratory Protection Considerations for Healthcare Workers During the COVID-19 Pandemic	Health security / Commentary	• This article presents 2 urgent strategies and 4 actions that would immediately strengthen protection to healthcare workers.
22.04.2020	Successful containment of COVID-19 outbreak in a large maternity and perinatal center while continuing clinical service	Pediatric allergy and immunology / Article	• Apart from massive testing of personnel in predefined phases and increased hygiene measures, including a general obligation to wear surgical face masks, the authors identified the need to monitor cases of illness across all groups of employees, to ensure social distancing within personnel and to evaluate contacts of clinical personnel outside of the hospital environment, in order to be able to interpret chains of infections and to disrupt them.
17.04.2020	CAN-NPI: A Curated Open Dataset of Canadian Non-Pharmaceutical Interventions in Response to the Global COVID-19 Pandemic	medRxiv (not peer reviewed) / Article	• The authors describe the rapid development of the first comprehensive, labelled dataset of 1640 Non-pharmaceutical interventions (NPIs) implemented at federal, provincial/territorial and municipal levels in Canada to guide COVID-19 research. • The dataset will be distributed via the website https://howsmyflattening.ca/#/data, as well as on Kaggle.

Treatment

Publication Date	Title/URL	Journal/ Article type	Digest
22.04.2020	The key role of palliative care in response to the COVID-19 tsunami of suffering	Lancet / Comment	• In this most challenging time, health responders can take advantage of palliative care know-how to focus on compassionate care and dignity, provide rational access to essential opioid medicines, and mitigate social isolation at the end of life and caregiver distress.

Date	Title	Source / Type	Summary
22.04.2020	What conditions could we prioritise in the primary care setting to reduce non-COVID-related admissions to hospital?	Oxford COVID-19 Evidence Service / Rapid review	• This rapid review has established that targeted interventions for influenza, COPD, CHF, diabetes, UTI and cellulitis should be identified to support increased management in primary care settings. • This could result in keeping people well and reducing preventable hospital admissions where possible.
22.04.2020	Neurosurgery in an infant with COVID-19	Lancet / Case report	• This is the first reported case of an infant with COVID-19 undergoing neurosurgical operations under general anaesthesia. • This case might reflect a general observation of relative resistance of babies and children to COVID-19, suggesting the possibility that paucisymptomatic infants with COVID-19 can undergo major surgical procedures without additional morbidity.
22.04.2020	Chloroquine dosing recommendations for pediatric COVID-19 supported by modeling and simulation	Clinical pharmacology and therapeutics / Brief report	• This study supports age-adjusted CHQ dosing in children with COVID-19 in order to avoid suboptimal or toxic doses.
17.04.2020	Effectiveness of Intravenous Immunoglobulin for Children with Severe COVID-19: A Rapid Review	medRxiv (not peer reviewed) / Rapid review	• A total of 1519 articles were identified via initial literature search. Of these six studies, including one randomized controlled trial (RCT), four case series and one case report involving 198 patients were included. One case series showed the survival of COVID-19 patients with acute respiratory distress syndrome (ARDS) was not improved by IVIG. One case report showed high-dose IVIG could improve the outcome of COVID-19 adults. Three observational studies showed inconsistent results of the effect of IVIG on SARS patients. One RCT showed that IVIG did not reduce mortality or the incidence of nosocomial infection in adults with severe SARS. The quality of evidence was between low and very low. • The existing evidence is insufficient to support the efficacy or safety of IVIG in the treatment of COVID-19.
18.04.2020	Utah-Stanford Ventilator (Vent4US): Developing a rapidly scalable ventilator for COVID-19 patients with ARDS	medRxiv (not peer reviewed) / Article	• The authors describe a minimum, rapidly scalable ventilator designed for COVID-19 patients with ARDS. Their design philosophy is not only to try to address potential ventilator shortages, but also to account for uncertainties in the supply chains of parts commonly used in traditional ventilators. • They estimate the component cost of the system to be around $500. • They publish their draft design documents and current implementation which is open and accessible in the hope that broadening the community globally will accelerate arriving at a solution and that peer review will improve the final design. All code developed for this work is openly accessible at out GitHub repository at

			https://github.com/vent4us/vent-devhttps://github.com/vent4us/vent-devhttp://www.vent4us.org
22.04.2020	Risks of ACE inhibitor and ARB usage in COVID-19: evaluating the evidence	Clinical pharmacology and therapeutics / Mini review	• Review concludes that patients being treated with ACEIs and ARBs should continue their use for approved indications.
20.04.2020	Potential therapeutic effects of dipyridamole in the severely ill patients with COVID-19	Acta Pharm Sin B / Article	• In a proof-of-concept trial involving 31 patients with COVID-19, dipyridamole supplementation was associated with significantly decreased concentrations of D-dimers (P<0.05), increased lymphocyte and platelet recovery in the circulation, and markedly improved clinical outcomes in comparison to the control patients.
20.04.2020	D3Targets-2019-nCoV: a webserver for predicting drug targets and for multi-target and multi-site based virtual screening against COVID-19	Acta Pharm Sin B / Article	• With 6 examples, this study demonstrated that the webserver should be useful to medicinal chemists, pharmacologists and clinicians for efficiently discovering or developing effective drugs against the SARS-CoV-2.
22.04.2020	May hydrogen peroxide reduce the hospitalization rate and complications of SARS-CoV-2 infection?	Infection control and hospital epidemiology / Accepted manuscript	• This article advises an off-label use of H2O23% (10 vol) by nasal and oral washings, carried out immediately in the time frame after the onset of the first symptoms and the assessed diagnosis of infection by SARSCoV-2, and however, during the period of illness, in home quarantine or hospitalized subjects not requiring intensive care.
22.04.2020	High incidence of venous thromboembolic events in anticoagulated severe COVID-19 patients	Journal of thrombosis and haemostasis / Brief report	• Results suggest considering both systematic screening of VTE and early therapeutic anticoagulation in severe ICU COVID-19 patients.
20.04.2020	CD147 as a Target for COVID-19 Treatment: Suggested Effects of Azithromycin and Stem Cell Engagement	Stem Cell Rev Rep / Article	• The possible direct viral invasion of progenitor/stem cells via CD147 or ACE2, could result in the decline of these cellular stocks and failing lung repair. Clinical tests with allogeneic MSCs from healthy individuals are underway to enhance endogenous lung repair and suppress inflammation.
22.04.2020	Mesenchymal stem cells as a potential treatment for critically ill patients with coronavirus disease 2019	Stem cells translational medicine / Letter	• MSCs were efficacious in reducing the non-productive inflammation and in promoting lung generation in a phase 2 clinical trial (NCT03608592), as well as in patients with ALI and ARDS in clinical practice. • As a result, MSCs may alleviate the SARS-CoV-2-derived CS and ARDS, and have a potential effect on the treatment of subsequent chronic respiratory dysfunction and lung fibrosis.
16.04.2020	Prioritisation of potential anti-SARS-CoV-2 drug repurposing opportunities based on ability to achieve adequate target site concentrations derived from	medRxiv (not peer reviewed) / Article	• The antiviral activity data reported to date is of variable quality and conducted under different conditions by different investigators. However, this analysis has prioritised candidates with the best chance for success in therapy or chemoprevention of Covid-19 based upon the

Publication Date	Title/URL	Journal/ Article type	Digest
	their established human pharmacokinetics		currently available in vitro activity and human plasma pharmacokinetic data. • Future studies should focus on EC90 values and discuss findings in the context of achievable exposures in humans, especially within target compartments such as the lung, in order to maximise the potential for success of proposed human clinical trials.
22.04.2020	Pain Management During the COVID-19 Pandemic in China: Lessons Learned	Pain medicine / Accepted manuscript	• Details strategies that were useful for management of pain management during treatment.

Social sciences

Publication Date	Title/URL	Journal/ Article type	Digest
22.04.2020	Vaccine confidence in the time of COVID-19	European journal of epidemiology / Essay	• Public confidence in vaccination programs depends on the work they do for the community-social, political, and moral as well as biological.
21.04.2020	The Effect of COVID-19 on Youth Mental Health	The Psychiatric quarterly / Article	• A cross-sectional study was conducted two weeks after the occurrence of COVID-19 in China to assess youth mental health and to investigate factors of mental health among youth groups. • Results of this study (n=584) suggest that nearly 40.4% of the youth group had a tendency to have psychological problems. Local governments should develop effective psychological interventions for youth groups, moreover, it is important to consider the educational level and occupation of the youth during the interventions.
22.04.2020	Capability, opportunity and motivation to enact hygienic practices in the early stages of the COVID-19 outbreak in the UK	PsyArXiv preprints (not peer-reviewed) / Article	• This study aimed to explore influences on hygienic practices, a set of key transmission behaviours, in relation to the Capability, Opportunity, Motivation-Behaviour (COM-B) model of behaviour change. • All three COM-B components significantly predicted good hygienic practices, with motivation having the greatest influence on behaviour. Reflective motivation was largely driving behaviour, with those highest in reflective motivation scoring 51% more on the measure of hygienic practices compared with those with the lowest scores. • Interventions should focus on increasing and maintaining motivation to act and include elements that promote and maintain social support and knowledge of COVID-19 transmission. Groups in particular need of targeting for interventions to increase hygienic practices are males and those living in cities and suburbs.

Publication Date	Title/URL	Journal/ Article type	Digest
10.04.2020	Understanding Economic and Health Factors Impacting the Spread of COVID-19 Disease	medRxiv (not peer reviewed) / Article	• The study explains multiple significant relationships between the COVID-19 data and other country-level statistics. They have also identified and statistically profiled four major country-level clusters with relation to different aspects of COVID-19 development and country-level economic and health indicators. • Specifically, this study has identified potential COVID-19 under-reporting traits as well as various economic factors that impact COVID-19 Diagnosis, Reporting, and Treatment. Based on the country clusters, they have also described the four disease development scenarios, which are tightly knit to country-level economic and public health factors. • Finally, they have highlighted the potential limitation of reporting and measuring COVID-19 and provided recommendations on further in-depth quantitative research.

Modelling

Publication Date	Title/URL	Journal/ Article type	Digest
16.04.2020	No test is better than a bad test: Impact of diagnostic uncertainty in mass testing on the spread of Covid-19	medRxiv (not peer reviewed) / Article	• The authors modified a SIR model to include quarantine states and test performance using publicly accessible estimates for the current situation. Three scenarios for cessation of lock-down measures are explored. • The assessment that 'no test is better than a bad test' is broadly supported by the present analysis. Antibody testing is unlikely to be a solution to the lock-down, regardless of test quality or capacity. A well designed active viral testing strategy combined with incremental relaxation of the lock-down measures is shown to be a potential strategy to restore some social activity whilst continuing to keep infections low.
18.04.2020	Analysis of the impact of lockdown on the evolution Covid-19 epidemics in Spain	medRxiv (not peer reviewed) / Article	• Estimated the number of cases and the impact of lockdown on the reproducibility number based on the hospitalization reports. • The large differences found in the speed of propagation of the disease show us that being able to implement interventions at the earliest stage is crucial to minimise the impact of a potential infectious threat. This work also stresses the importance of reliable up to date

			epidemiological data in order to accurately assess the impact of Public Health policies on viral outbreak.
18.04.2020	Outbreak dynamics of COVID-19 in Europe and the effect of travel restrictions	medRxiv (not peer reviewed) / Article	• The authors simulations show that mobility networks of air travel can predict the emerging global diffusion pattern of a pandemic at the early stages of the outbreak. The results suggest that an unconstrained mobility would have significantly accelerated the spreading of COVID-19, especially in Central Europe, Spain, and France.
22.04.2020	Effectiveness of interventions targeting air travellers for delaying local outbreaks of SARS-CoV-2	medRxiv (not peer reviewed) / Article	• Under baseline assumptions, introducing exit and entry screening in combination with traveller sensitisation can delay a local SARS-CoV-2 outbreak by 8 days when the rate of importation is 1 infected traveller per week at time of introduction. The additional benefit of entry screening is small if exit screening is effective: the combination of only exit screening and traveller sensitisation can delay an outbreak by 7 days. In the absence of screening, with less effective sensitisation, or a higher rate of importation, these delays shrink rapidly to less than 4 days. • Syndromic screening and traveller sensitisation in combination may have marginally delayed SARS-CoV-2 outbreaks in unaffected countries.
19.04.2020	Seasonality and uncertainty in COVID-19 growth rates	medRxiv (not peer reviewed) / Article	• Using current, fine-scaled weather data and global reports of infection the authors developed a model that explained 36% of variation in early growth rates before intervention, with 17% based on weather or demography and 19% based on country-specific effects. They found that ultraviolet light was most strongly associated with lower COVID-19 growth rates. • Projections suggest that, in the absence of intervention, COVID-19 will decrease temporarily during summer, rebound by autumn, and peak next winter. However, uncertainty remains high and the probability of a weekly doubling rate remained >20% throughout the summer in the absence of control. Consequently, aggressive policy interventions will likely be needed in spite of seasonal trends.
19.04.2020	COVID-19 outbreak in Wuhan demonstrates the limitations of publicly available case numbers for epidemiological modelling	medRxiv (not peer reviewed) / Article	• The results show that parameter estimates and predictions obtained for several established models on the basis of reported case numbers can be subject to substantial uncertainty. More importantly, estimates were often unrealistic and the confidence / credibility intervals did not cover plausible values of critical parameters obtained using different approaches. These findings suggest, amongst others, that several

			models are over-simplistic and that the reported case numbers often provide insufficient information.
18.04.2020	An empirical estimate of the infection fatality rate of COVID-19 from the first Italian outbreak	medRxiv (not peer reviewed) / Article	• The empirical estimates based on population level data show a sharp difference in fatality rates between young and old people and firmly rule out overall fatality ratios below 0.5% in populations with more than 30% over 60 years old.
19.04.2020	How best to use limited tests? Improving COVID-19 surveillance in long-term care	medRxiv (not peer reviewed) / Article	• The authors used an individual-based transmission model to simulate COVID-19 spread along inter-individual contact networks in the LTCF setting. A range of surveillance strategies were evaluated for their ability to detect simulated outbreaks, assuming limited availability of standard RT-PCR tests. Various epidemiological scenarios were considered, including COVID-19 importation from patient transfers or staff members infected in the community.
17.04.2020	Why does COVID-19 case fatality rate vary among countries?	medRxiv (not peer reviewed) / Article	• The authors first showed that temporal trajectories of case fatality rate greatly vary among countries. They found no evidence for association between comorbidities and case fatality rate at the country level. Case fatality rate was negatively associated with number of hospital beds x1,000 inhabitants. They also report evidence suggesting an association between case fatality rate and the political regime, with democracies suffering from the highest mortality burden, compared to autocratic regimes. However, most of the among-country variance in case fatality rate remained unexplained. • Overall, these results emphasize the role of socio-economic and political factors as possible drivers of COVID-19 case fatality rate at the country level.

Guidance, consensus statements and hospital resources

Publication Date	Title/URL	Journal/ Article type
22.04.2020	Screening and triage at health-care facilities in Timor-Leste during the COVID-19 pandemic	Lancet Respiratory Medicine / Correspondence
09.04.2020	NG170: COVID-19 rapid guideline: cystic fibrosis	NICE / Rapid guideline
03.04.2020	NG163: COVID-19 rapid guideline: managing symptoms (including at the end of life) in the community	NICE / Rapid guideline
23.04.2020	NG172: COVID-19 rapid guideline: gastrointestinal and liver conditions treated with drugs affecting the immune response	NICE / Rapid guideline
23.04.2020	NG171: COVID-19 rapid guideline: acute myocardial injury	NICE / Rapid guideline

20.04.2020	Thoracic radiation therapy during COVID-19: provisional guidelines from a comprehensive cancer center within a pandemic epicenter	Adv Radiat Oncol / Article in press
22.04.2020	Managing childhood allergies and immunodeficiencies during respiratory virus epidemics - the 2020 COVID-19 pandemic	Pediatric allergy and immunology / Consensus statement
22.04.2020	Systemic Immunosuppressive Therapy for Inflammatory Skin Diseases in Children: Expert-Consensus-Based Guidance for Clinical Decision Making During the COVID-19 Pandemic	Pediatric dermatology / Consensus statement
16.04.2020	Clinical Consensus Recommendations Regarding Non-Invasive Respiratory Support in the Adult Patient with Acute Respiratory Failure Secondary to SARS-CoV-2 infection	Rev Esp Anestesiol Reanim / Consensus
22.04.2020	Points to consider in the preparation and transfusion of COVID-19 convalescent plasma	Vox sanguinis / Commentary
21.04.2020	Managing high clinical suspicion COVID-19 inpatients with negative RT-PCR: a pragmatic and limited role for thoracic CT	Thorax / Article
21.04.2020	Prevention and Treatment of Venous Thromboembolism Associated with Coronavirus Disease 2019 Infection: A Consensus Statement before Guidelines	Thrombosis and haemostasis / Review

Overviews, comments and editorials

Publication Date	Title/URL	Journal/ Article type
22.04.2020	A call for action for COVID-19 surveillance and research during pregnancy	Lancet Global Health / Comment
22.04.2020	COVID-19: a need for real-time monitoring of weekly excess deaths	Lancet / Correspondence
22.04.2020	COVID-19 comes to the United States	JAMA / Editor's comment
22.04.2020	Neurological Insights of COVID-19 Pandemic	ACS chemical neuroscience
20.04.2020	Reorganize and survive-a recommendation for healthcare services affected by COVID-19-the ophthalmology experience	Nature / Comment
21.04.2020	The potential danger of suboptimal antibody responses in COVID-19	Nature reviews. Immunology / Comment
20.04.2020	Prevention and control strategies for the diagnosis and treatment of cancer patients during the COVID-19 pandemic	Br J Cancer / Comment
22.04.2020	Extended use or reuse of N95 respirators during COVID-19 pandemic: an overview of national regulatory authorities' recommendations	Infection control and hospital epidemiology
22.04.2020	Critical role of Wuhan cabin hospital in controlling local COVID-19 pandemic	Infection control and hospital epidemiology / Letter
22.04.2020	Public health, health systems and palliation planning for COVID-19 on an exponential timeline	The Medical journal of Australia / Perspective
20.04.2020	The need for urogenital tract monitoring in COVID-19	Nat Rev Urol / Comment
21.04.2020	Mitigating the Impacts of the COVID-19 Pandemic Response on At-Risk Children	Pediatrics / Preprint

Date	Title	Journal / Type
21.04.2020	Cardiovascular Complications in Patients with COVID-19: Consequences of Viral Toxicities and Host Immune Response	Current cardiology reports / Hot topic
21.04.2020	Therapeutic uncertainties in people with cardiometabolic diseases and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2 or COVID-19)	Diabetes, obesity & metabolism / Brief report
21.04.2020	Protecting older people from COVID-19: should the United Kingdom start at age 60?	Journal of the Royal Society of Medicine / Article Commentary
21.04.2020	COVID-19 FAQ's in Pediatric Cardiac Surgery	World journal for pediatric & congenital heart surgery / Brief communication
22.04.2020	Health system, public health, and economic implications of managing COVID-19 from a cardiovascular perspective	European heart journal / Article
20.04.2020	Cytology in the time of coronavirus disease (covid-19): an Italian perspective	J Clin Pathol / Short report
20.04.2020	The Technique and Justification for Minimally Invasive Surgery in COVID-19 Pandemic: Laparoscopic Anterior Resection for Near Obstructed Rectal Carcinoma	J Laparoendosc Adv Surg Tech A / Article

Produced by the PHE COVID-19 Literature Digest Team

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