Public Health England

International EPI Cell Evidence Digest – 05/08/2020

This 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:

- Serology and immunology
- Diagnostics
- Genomics
- Epidemiology and clinical - children and pregnancy
- Epidemiology and clinical - risk factors
- Epidemiology and clinical - other
- Infection control
- Treatment
- 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Please note that we are including preprints (highlighted in red), which are preliminary reports of work that have NOT been peer-reviewed.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.

Serology and immunology

Publication Date	Title/URL	Journal/ Article type	Digest
03.08.2020	Abnormal concentration of porphyrins in serum from COVID-19 patients	Br J Haematol / Commentary	• Authors report an abnormal accumulation of porphyrins associated to severe COVID-19 patients that may shed some light to understand the haematological disorder associated with COVID-19 • Quantify total porphyrin content in sera of a cohort of 134 COVID-19 patients, reporting on acute phase as samples collected upon

			admission to the hospital. Also analysed a cohort of 60 PCR-negative patients (COVID-neg) but also undergoing pneumonia and 54 serum samples collected in 2018-2019 (i.e., well before start of the COVID-19 pandemic) during an annual medical check-up.

Diagnostics

Publication Date	Title/URL	Journal/ Article type	Digest
04.08.2020	Thoracic imaging of coronavirus disease 2019 (COVID-19) in children: a series of 91 cases	Pediatr Radiol / Article	• Authors sought to review paediatric COVID-19 cases worldwide via survey, summarizing both clinical and imaging findings. Ninety-one children included (49 males; median age: 6.1 years, interquartile range: 1.0 to 13.0 years, range: 9 days-17 years). • Chest radiographs available in 89% of patients; 10% were normal. • Unnecessary to perform chest imaging in children to diagnose COVID-19. Chest radiography can be used in symptomatic children to assess airway infection or pneumonia. CT should be reserved for when there is clinical concern to assess for possible complications, especially in children with coexisting medical conditions.

Genomics

Publication Date	Title/URL	Journal/ Article type	Digest
01.07.2020	Variant analysis of SARS-CoV-2 genomes	Bull World Health Organ / Research	• Authors analysed the COVID-19 genome from 10,022 samples to understand variability in the viral genome and identify emerging clades. • The study identified 5775 distinct genome variants • The most common variants were the synonymous 3037C > T (6334 samples), P4715L in the open reading frame 1ab (6319 samples) and D614G in the spike protein (6294 samples). • Six major clades, (that is, basal, D614G, L84S, L3606F, D448del and G392D) and 14 subclades were identified. • Regarding the base changes, the C > T mutation was the most common with 1670 distinct variants.

Epidemiology and clinical - children and pregnancy

Publication Date	Title/URL	Journal/ Article type	Digest
15.07.2020	Maternal COVID-19 infection, clinical characteristics, pregnancy, and neonatal outcome: A prospective cohort study	Eur J Obstet Gynecol Reprod Biol / Article	• Prospective cohort study - effect of COVID-19 on pregnancy and neonatal outcomes - in a large tertiary maternity unit within a university hospital (Birmingham, UK) with an average annual birth of over 10,000 births. • Twenty-three pregnant patients tested positive for COVID-19, delivering 20 babies including a set of twins, with four ongoing pregnancies. 16/23 (70 %) from Asian (Indian sub-continent) background. • COVID-19 associated with high prevalence of preterm birth, preeclampsia, and caesarean section compared to non-COVID pregnancies. COVID-19 not found in the newborns and none developed severe neonatal complications.
02.08.2020	Early-onset symptomatic neonatal COVID-19 infection with high probability of vertical transmission	Infection / Case Report	• Case study highlights a strong possibility of vertical transmission of COVID-19 from a mildly symptomatic, RT-PCR negative but antibody-positive mother with significant symptomatic, early-onset neonatal infection.
30.07.2020	Vertical Transmission of COVID-19: A Systematic Review and Meta-analysis	Am J Obstet Gynecol / Research article	• A systematic review to determine estimates of vertical transmission of COVID-19 based upon early RNA detection after birth from various neonatal/fetal sources and neonatal serology. • Vertical transmission of SARS-CoV-2 is possible and appears to occur in a minority of cases of maternal COVID-19 infection in third trimester. • Rates of infection are similar to other pathogens that cause congenital infections. • However, given the paucity of early trimester data, no assessment can yet be made regarding rates of vertical transmission in early pregnancy as well as potential risk for consequent fetal morbidity and mortality.
02.08.2020	SARS-CoV-2 can infect the placenta and is not associated with specific placental histopathology: a series of 19 placentas from COVID-19-positive mothers	Mod Pathol / Article	• Authors examined 19 COVID-19 exposed placentas for histopathologic findings, and for expression of ACE2, and TMPRSS2 by immunohistochemistry.

Epidemiology and clinical - risk factors

Publication Date	Title/URL	Journal/ Article type	Digest
03.08.2020	Ethnic minority groups in England and Wales - factors affecting the size and timing of elevated COVID-19 mortality: a retrospective cohort study linking Census and death records	medRxiv (non-peer reviewed)	• Retrospective cohort study to estimate population-level associations between ethnicity and COVID-19 mortality, and investigate how ethnicity-specific mortality risk evolved over the course of the pandemic. • Differences in COVID-19 mortality between ethnic groups were largely attenuated by geographical and socio-economic factors, although some residual differences remained. • Lockdown was associated with reductions in excess mortality risk in ethnic minority populations, which has implications for a second wave of infection or local spikes. • Further research is needed to understand the causal mechanisms underpinning observed differences in COVID-19 mortality between ethnic groups.
03.08.2020	Immune complement and coagulation dysfunction in adverse outcomes of SARS-CoV-2 infection	Nat Med / article	• Authors performed a retrospective observational study (n=6,398) - 88 patients with history of macular degeneration, 4 with complement deficiency disorders and 1,179 with coagulatory disorders • History of macular degeneration (a proxy for complement-activation disorders) and history of coagulation disorders (thrombocytopenia, thrombosis and haemorrhage) are risk factors for SARS-CoV-2-associated morbidity and mortality—effects that are independent of age, sex or history of smoking.

Epidemiology and clinical – other

Publication Date	Title/URL	Journal/ Article type	Digest
04.08.2020	Outcome of 1890 tracheostomies for critical COVID-19 patients: a national cohort study in Spain	Eur Arch Otorhinolaryngol / Article	• An observational study evaluated outcomes of tracheostomy on intubated COVID-19 patients (n=1890) across 120 hospitals in Spain, from 28 March to 15 May 2020. • 1,461 surgical (81.3%) and 429 percutaneous tracheostomies were performed.

			• Median timing of tracheostomy was 12 days (4-42 days) since orotracheal intubation. • A close follow-up of 1616/1890 (85.5%) patients at the cut-off time of 1-month follow-up showed that in 842 (52.1%) patients, weaning was achieved, while 391 (24.2%) were still under mechanical ventilation and 383 (23.7%) patients had died from COVID-19. • Decannulation among those in whom weaning was successful (n = 842) was achieved in 683 (81%) patients.
03.08.2020	Tracheostomy, ventilatory wean, and decannulation in COVID-19 patients	Eur Arch Otorhinolaryngol / Article	• An observational cohort study examined factors influencing the trajectory of tracheostomy care in COVID-19 patients. • Higher FiO(2) at tracheostomy and higher pre-tracheostomy peak cough flow are associated with increased delay in COVID-19 tracheostomy patient decannulation. • These finding comprise the most comprehensive report of COVID-19 tracheostomy decannulation to date and will assist service planning for future pandemic peaks.
04.08.2020	Viral cultures for COVID-19 infectivity assessment. Systematic review	medRxiv (non-peer reviewed)	• A review of the evidence from studies comparing COVID-19 culture with reverse transcriptase polymerase chain reaction (rt-PCR), as viral culture represents the best indicator of current infection and infectiousness of the isolate. • The data is suggestive of a relation between the time from collection of a specimen to test, copy threshold, and symptom severity, but the quality of the studies was moderate with lack of standardised reporting and lack of testing of PCR against viral culture or infectivity in animals. • This limits our current ability to quantify the relationship between viral load, cycle threshold and viable virus detection and ultimately the usefulness of PCR use for assessing infectiousness of patients. • Prospective routine testing of reference and culture specimens are necessary for each country involved in the pandemic to establish the usefulness and reliability of PCR for Covid-19 and its relation to patients factors such as date of onset of symptoms and copy threshold, in order to help predict infectivity.
15.07.2020	Is a "COVID-19-free" hospital the answer to resuming elective surgery during the current pandemic? Results from the first available prospective study	Surgery / Article	• A prospective cohort study (n=309) assessed feasibility of resuming elective operations during the COVID-19 pandemic. • No patients died nor required intensive care unit admission. • One patient was diagnosed with COVID-19 after being transferred

			to the nearest local emergency hospital for management of postoperative pain. No patient developed pulmonary complications. • Twenty-seven patients (8.7%) developed complications. Complications graded as 2 and 3 according to the Clavien-Dindo classification occurred in 14 and 2 patients, respectively. • Suggests that COVID-19-free hospitals can represent a safe setting to resume many types of elective surgery during the peak of a pandemic.

Infection control

Publication Date	Title/URL	Journal/ Article type	Digest
31.07.2020	Containing the Spread of Infectious Disease on College Campuses	medRxiv (non-peer reviewed)	• The authors apply a stochastic transmission model to quantify the impact of university-level responses to the 2014 and 2016 mumps outbreaks at Ohio State University and Harvard University, and assess which control interventions are most effective for containing the spread of infection diseases. This also has relevance to the current COVID-19 pandemic. • Results suggest universities should design more aggressive diagnostic procedures and stricter isolation policies to decrease infectious disease incidence on campus. • The model can be applied to data from other outbreaks in college campuses and similar small-population settings.

Treatment

Publication Date	Title/URL	Journal/ Article type	Digest
03.08.2020	Feasibility and clinical impact of out-of-ICU non-invasive respiratory support in patients with COVID-19 related pneumonia	Eur Respir J / Article	• In this observational study, data from 670 consecutive COVID-19 patients referred to the Pulmonology Units in nine Italian hospitals between March 1 - May 10 were analysed. • Authors analysed the safety of the hospital staff, the feasibility, and outcomes of NRS (i.e. high-flow nasal cannula (HFNC), continuous positive airway pressure (CPAP), non-invasive

			ventilation(NIV)) applied to patients outside the ICU. • The application of NRS outside the ICU is feasible and associated with favourable outcomes. Nonetheless, it was associated with a risk of staff contamination.

Modelling

Publication Date	Title/URL	Journal/ Article type	Digest
04.08.2020	Fitting models to the COVID-19 outbreak and estimating R	medRxiv (non-peer reviewed)	• Paper presenting the inference scheme employed for calibrating the Warwick COVID-19 model to the available public health data streams, which span hospitalisations, critical care occupancy, mortality and serological testing. • The computational simulations make use of the acquired parameter posterior distributions, to assess how the accuracy of short-term predictions varied over the time course of the outbreak. • The authors compare how refinements to data streams and model structure impact estimates of epidemiological measures, including the estimated growth rate and daily incidence.
03.08.2020	Estimating COVID-19 under-reporting across 86 nations: implications for projections and control	medRxiv (non-peer reviewed)	• Authors estimate how asymptomatic transmission, disease acuity, hospitalization, and behavioural responses to risk shape COVID-19 pandemic dynamics in 86 countries. • Estimated cumulative cases and deaths through 10 July 2020 are 10.5 and 1.47 times official reports, yielding an infection fatality rate (IFR) of 0.65%, with wide variation across nations. • Despite underestimation, herd immunity remains distant. • Suggests sufficient early testing could have averted 39.7 (35.3-45.3) million cases and 218 (191-257) thousand deaths. • Responses to perceived risk cause the reproduction number to settle near 1, but with very different steady-state incidence, while some nations experience endogenous rebounds. • Scenarios through March 2021 show modest enhancements in responsiveness could reduce cumulative cases ≈80%, to 271 (254-412) million across these nations.

Guidance, consensus statements

Publication Date	Title/URL	Journal/ Article type
29.07.2020	Managing cancer patients during the COVID-19 pandemic: An ESMO Interdisciplinary Expert Consensus	Ann Oncol

Overviews, comments and editorials

Publication Date	Title/URL	Journal/ Article type
30.07.2020	Antibodies in serum of convalescent patients following mild COVID-19 do not always prevent virus receptor binding	Allergy / Letter
02.08.2020	Blood Myeloperoxidase-DNA, a biomarker of early response to SARS-CoV-2 infection?	Allergy / Letter
04.08.2020	Errors in Trial of Effect of Convalescent Plasma Therapy on Time to Clinical Improvement in Patients With Severe and Life-threatening COVID-19	Jama / Comment
04.08.2020	SeroTracker: a global SARS-CoV-2 seroprevalence dashboard	The Lancet Infectious Diseases / Correspondence
03.08.2020	Using serological data to understand unobserved SARS-CoV-2 risk in health-care settings	The Lancet Infectious Diseases / Comment
03.08.2020	Update Alert 3: Epidemiology of and Risk Factors for Coronavirus Infection in Health Care Workers	Annals of Internal Medicine / Letter
03.08.2020	COVID-19 mortality: A complex interplay of sex, gender, and ethnicity	Eur J Public Health / Commentary
03.08.2020	COVID-19 spread in the UK: the end of the beginning?	The Lancet / Comment
03.08.2020	Reopening schools during the COVID-19 pandemic: governments must balance the uncertainty and risks of reopening schools against the clear harms associated with prolonged closure	Arch Dis Child / Viewpoint
03.08.2020	Finding a path to reopen schools during the COVID-19 pandemic	The Lancet Child & Adolescent Health / Comment
03.08.2020	Vitamin D for COVID-19: a case to answer?	The Lancet Diabetes & Endocrinology / Comment
03.08.2020	Resuming health services during the Covid-19 pandemic: What can the NHS learn from other countries?	Nuffield Trust / Briefing
04.08.2020	Cancer Treatment and Research During the COVID-19 Pandemic: Experience of the First 6 Months	Oncol Ther / Commentary

Produced by the PHE COVID-19 Literature Digest Team
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