



COVID-19 Literature Digest – 23/10/2020

Dear all,

Please find [today's report](#) below.

PHE's COVID-19 Literature Digest has been produced since February 2020. A selection of our previous Digests [can be found here](#). This resource aims to highlight a small selection of recent COVID-19 papers that are relevant to UK settings, contains new data / insights or emerging trends. The Digest team generate a report three times per week (Mon, Wed, Fri), which includes both preliminary reports of work (preprints) that have NOT been peer-reviewed and research that has been subject to peer review and wider scrutiny. The Digest is very rapidly produced and does not claim to be a perfect product; the inclusion or omission of a publication should not be viewed as an endorsement or rejection by PHE. We do not accept responsibility for the availability, reliability or content of the items included in this resource.

To join our email distribution list please send a request to COVID.LitDigest@phe.gov.uk. If you are interested in papers relating to behaviour and social science please contact COVID19.behaviouralscience@phe.gov.uk to sign up to receive the PHE Behavioural Sciences Weekly Report.

Best wishes,

Bláthnaid Mahon, Emma Farrow, James Robinson
On behalf of the PHE COVID-19 Literature Digest Team

Report for 23.10.2020 (please note that papers that have **NOT been peer-reviewed** are highlighted in red).

Sections:

[Serology and immunology](#)

[Diagnostics](#)

[Epidemiology and clinical – children / pregnancy](#)

[Epidemiology and clinical – risk factors](#)

[Epidemiology and clinical – long term complications / sequelae](#)

[Epidemiology and clinical – other](#)

[Infection control / non-pharmaceutical interventions](#)

[Treatment](#)

Serology and immunology

Publication Date	Title / URL	Journal / Article type	Digest
22.10.2020	Serologic Responses in Healthy Adult with SARS-CoV-2 Reinfection, Hong Kong, August 2020	Emerg Infect Dis / Letter	<ul style="list-style-type: none"> • In Mar 2020, mild signs and symptoms of coronavirus disease developed in a healthy 33-year-old man in Hong Kong. • His first infection did not produce virus neutralizing antibodies. • In Aug, he had asymptomatic reinfection, suggesting that persons without a robust neutralizing antibody response might be at risk for reinfection.
22.10.2020	SARS-CoV-2 antibody prevalence, titres and neutralising activity in an antenatal cohort, United Kingdom, 14 April to 15 June 2020	Eurosurveillance / Rapid communication	<ul style="list-style-type: none"> • SARS-CoV-2 IgG screening of 1,000 antenatal serum samples in the Oxford area, UK, between 14 Apr and 15 June 2020, yielded a 5.3% seroprevalence, mirroring contemporaneous regional data. • Among the 53 positive samples, 39 showed in vitro neutralisation activity, correlating with IgG titre (Pearson's correlation $p < 0.0001$). • While SARS-CoV-2 seroprevalence in pregnancy cohorts could potentially inform population surveillance, clinical correlates of infection and immunity in pregnancy, and antenatal epidemiology evolution over time need further study.
22.10.2020	Detection of neutralising antibodies to SARS-CoV-2 to determine population exposure in Scottish blood donors between March and May 2020	Eurosurveillance / Research	<ul style="list-style-type: none"> • Aimed to determine if sera from blood bank donors can be used to track the emergence and progression of the SARS-CoV-2 epidemic. • Samples from 3,500 blood donors were collected in Scotland between 17 Mar and 18 May 2020. Controls were collected from 100 donors in Scotland during 2019. • Neutralising antibodies were detected in six of 500 donors from 23 to 26 Mar. The number of samples containing neutralising antibodies did not significantly rise after 5–6 April until the end of the study on 18 May. • Found that infections were concentrated in certain postcodes, indicating that outbreaks of infection were extremely localised. In contrast, other areas remained comparatively untouched by the epidemic.
21.10.2020	COVID-19 prevalence and seroconversion in an urban hemodialysis unit in the United Kingdom	Hemodial Int / Letter	<ul style="list-style-type: none"> • In a single centre haemodialysis population (1253 patients) a high prevalence of COVID-19 exposure was observed (n=207; 16.5%). • Mortality of positive patients was high, in line with other London units (n=44; 21%). • High levels of seroconversion in antigen positive patients (95%) was observed despite patients being considered immunosuppressed. • Just over 11% of the haemodialysis population were found to be antibody positive despite earlier testing swab negative, or never having had a swab by virtue of being asymptomatic.

			<ul style="list-style-type: none"> • Suggests a higher asymptomatic carriage rate during pandemic peak, and that measures put in place in the dialysis units may have prevented further transmission.
19.10.2020	Use of dried blood spot samples for SARS-CoV-2 antibody detection using the Roche Elecsys high throughput immunoassay	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Compares antibody detection in dried blood spot (DBS) eluates with antibody detection in paired plasma samples, using the same assay, in a study of 195 emergency workers in England. • A total of 18/195 (9.2%) participants tested positive using plasma samples. • DBS sample quality varied markedly by phlebotomist, and low sample volume significantly reduced immunoassay signals. • Sensitivity and specificity of DBS were 89.0% (95% CI 67.2, 96.9%) and 100.0% (95% CI 97.9, 100%) respectively compared with using plasma. • The limit of detection for DBS is about 30 times higher than for plasma.
20.10.2020	Neuropilin-1 facilitates SARS-CoV-2 cell entry and infectivity	Science / Article	<ul style="list-style-type: none"> • Demonstrates that neuropilin-1 (NRP1), known to bind furin-cleaved substrates, significantly potentiates SARS-CoV-2 infectivity, an effect blocked by a monoclonal blocking antibody against NRP1. • A SARS-CoV-2 mutant with an altered furin cleavage site did not depend on NRP1 for infectivity. • Pathological analysis of human COVID-19 autopsies revealed SARS-CoV-2 infected cells including olfactory neuronal cells facing the nasal cavity positive for NRP1.
20.10.2020	Neuropilin-1 is a host factor for SARS-CoV-2 infection	Science / Article	<ul style="list-style-type: none"> • Authors used X-ray crystallography and biochemical approaches to demonstrate that the S1 C-end rule (CendR) motif directly bound Neuropilin-1 (NRP1). • Blocking this interaction using RNAi or selective inhibitors reduced SARS-CoV-2 entry and infectivity in cell culture. • Suggests NRP1 serves as a host factor for SARS-CoV-2 infection and may potentially provide a therapeutic target.

Diagnostics

Publication Date	Title / URL	Journal / Article type	Digest
21.20.2020	A pooled testing strategy for identifying SARS-CoV-2 at low prevalence	Nature / Article	<ul style="list-style-type: none"> • Proposes an algorithm for pooling sub-samples based on the geometry of a hypercube that, at low prevalence, accurately identifies infected individuals in a small number of tests and rounds of testing. • Discusses optimal group size and explains why largely parallel searches are preferred. • Reports proof of concept experiments in which a positive subsample was detected even when diluted 100-fold with negative subsamples (cf. 30-fold to 48-fold dilution in Refs. 9–11). • Quantifies the loss of sensitivity due to dilution and discuss how it may be

			<p>mitigated by frequent re-testing of groups, for example.</p> <ul style="list-style-type: none"> • Field trials of this approach are under way in Rwanda and South Africa.
19.10.2020	Accuracy of Healthcare Professionals Nasopharyngeal Swab Technique in SARS-CoV-2 Specimen Collection	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Prospective study of nasopharyngeal swab technique by staff in an academic tertiary referral centre in (228 participants). • Technique was poor, with a success rate of nasopharyngeal swabbing at 38.6%. • Angle and length of insertion were significantly different between those with successful and unsuccessful technique. • Doctors were significantly more accurate than nurses and non-healthcare professionals (p<0.01).

Epidemiology and clinical – children / pregnancy

Publication Date	Title / URL	Journal / Article type	Digest
20.10.2020	Delayed presentation to regular Dutch paediatric care in COVID-19 times: a national survey	BMJ Paediatr Open / Original research letter	<ul style="list-style-type: none"> • Authors explored collateral harm in Dutch children and adolescents during pandemic from experience of paediatricians on Dutch Paediatric Society website. • 51 reports of collateral harm. Mostly v. young children with mainly acute physical problems but also social problems. In older children, several cases of diabetic ketoacidosis reported. • Results show delaying care can lead to seriously ill children, life-threatening situations and even death. • To avoid such a delay at a possible second peak, general care providers and paediatricians have to join forces and find new ways of working. Systematic data collection of collateral harm in children is needed to be able to intervene adequately.

Epidemiology and clinical – risk factors

Publication Date	Title / URL	Journal / Article type	Digest
23.10.2020	Rapid Risk Assessment: Increased transmission of COVID-19 in the EU/EEA and the UK – thirteenth update	European Centre for Disease Prevention and Control / Risk assessment	<ul style="list-style-type: none"> • In this update, the authors assess the risk for the general population and vulnerable individuals in relation to the increase in COVID-19 notification rates in the EU/EEA and the UK.
21.10.2020	COVID-19 in a Correctional Facility Employee Following Multiple Brief Exposures to Persons with COVID-19 — Vermont, July–August 2020	MMWR Morb Mortal Wkly Rep / Report	<ul style="list-style-type: none"> • On Aug 11, 2020, a confirmed case of COVID-19 in a male 20 yo correctional officer was reported to the Vermont Department of Health (VDH). • On July 28, the correctional officer had multiple brief encounters with six

			<p>incarcerated or detained persons (IDPs)* while their SARS-CoV-2 test results were pending.</p> <ul style="list-style-type: none"> • On July 29, all six IDPs received positive test results. VDH and VDOC conducted a contact tracing investigation† and used video surveillance footage to determine that the correctional officer did not meet VDH’s definition of close contact; therefore, he continued to work. • Although the initial assessment did not suggest that the officer had close contact exposures, detailed review of video footage identified that the cumulative duration of exposures exceeded 15 minutes. • In correctional settings, frequent encounters of ≤6 feet between IDPs and facility staff members are necessary; public health officials should consider transmission-risk implications of cumulative exposure time within such settings.
21.10.2020	COVID-19 Mortality Risk in Down Syndrome: Results From a Cohort Study Of 8 Million Adults	Ann Intern Med / Letters	<ul style="list-style-type: none"> • Of 8.26 million adults in this UK study cohort, 4053 had Down syndrome - of which 68 died: 27 (39.7%) of COVID-19, 17 (25.0%) of pneumonia or pneumonitis, and 24 (35.3%) of other causes. • Authors estimated a 4-fold increased risk for COVID-19–related hospitalization and a 10-fold increased risk for COVID-19–related death in persons with Down syndrome, a group that is currently not strategically protected.
23.10.2020	A large national outbreak of COVID-19 linked to air travel, Ireland, summer 2020	Eurosurveillance / Rapid communication	<ul style="list-style-type: none"> • An outbreak of 59 cases of COVID-19 originated with 13 cases linked by a 7 h, 17% occupancy flight into Ireland, summer 2020. • The flight-associated attack rate was 9.8–17.8%. Spread to 46 non-flight cases occurred country-wide. • Asymptomatic/pre-symptomatic transmission in-flight from a point source is implicated by 99% homology across the virus genome in five cases travelling from three different continents. • Restriction of movement on arrival and robust contact tracing can limit propagation post-flight.
23.10.2020	Association Between Social Vulnerability and a County's Risk for Becoming a COVID-19 Hotspot - United States, June 1-July 25, 2020	MMWR Morb Mortal Wkly Rep / Report	<ul style="list-style-type: none"> • Analyses county-level data on COVID-19 cases from 1 June - 25 July 2020, and from the 2018 CDC Social Vulnerability Index, to examine associations between social vulnerability and hotspots. • Areas with greater social vulnerabilities, particularly those related to higher representation of racial and ethnic minority residents (risk ratio [RR] = 5.3; 95% confidence interval [CI] = 4.4-6.4), density of housing units per structure (RR = 3.1; 95% CI = 2.7-3.6), and crowded housing units (i.e., more persons than rooms) (RR = 2.0; 95% CI = 1.8-2.3), were more likely to become hotspots, especially in less urban areas. • Among hotspot counties, those with greater social vulnerability had higher COVID-

			19 incidence during the 14 days after detection (212-234 cases per 100,000 persons for highest SVI quartile versus 35-131 cases per 100,000 persons for other quartiles).
21.10.2020	Characteristics Associated With Racial/Ethnic Disparities in COVID-19 Outcomes in an Academic Health Care System	JAMA Netw Open / Original investigation	<ul style="list-style-type: none"> • Cohort study of 5698 patients tested for or diagnosed with COVID-19: high population density, type 2 diabetes, and kidney disease were associated with hospitalization, in addition to older age, male sex, and obesity. • Adjusting for covariates, non-Hispanic Black patients were 1.72-fold more likely to be hospitalized than non-Hispanic White patients, while no significant race differences were observed in intensive care unit admission and mortality.
20.10.2020	Living risk prediction algorithm (QCOVID) for risk of hospital admission and mortality from coronavirus 19 in adults: national derivation and validation cohort study	BMJ / Research	<ul style="list-style-type: none"> • Authors derive and validate a risk prediction algorithm based on QResearch database (1205 general practices in England with linkage to covid-19 test results, Hospital Episode Statistics, and death registry data). • Final risk algorithms included age, ethnicity, deprivation, body mass index, and a range of comorbidities. • The QCOVID population based risk algorithm performed well, showing very high levels of discrimination for deaths and hospital admissions due to covid-19
19.10.2020	Early prognostication of COVID-19 to guide hospitalisation versus outpatient monitoring using a point-of-test risk prediction score	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Identifies independent mortality predictors in a derivation cohort of COVID-19 patients (n=983; median age 70) via multivariate regression with bootstrapping, and externally validated against a large random sample of the ISARIC cohort (n=14,231) and a smaller cohort from Aintree (n=290). • A five-predictor score termed SOARS (SpO2, Obesity, Age, Respiratory rate, Stroke history) was developed through sequential modelling to correlate COVID-19 severity across low, moderate and high strata of mortality risk.

Epidemiology and clinical – long term complications / sequelae

Publication Date	Title / URL	Journal / Article type	Digest
20.10.2020	Cognitive deficits in people who have recovered from COVID-19 relative to controls: An N=84,285 online study	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Analysed cognitive test data from 84,285 Great British Intelligence Test participants who completed a questionnaire regarding suspected and biologically confirmed COVID-19 infection. • People who recovered, including those no longer reporting symptoms, exhibited significant cognitive deficits when controlling for age, gender, education level, income, racial-ethnic group and pre-existing medical disorders. • There was substantial effect size for people who had been hospitalised, but also for mild but biologically confirmed cases who reported no breathing difficulty. • Finer grained analyses of performance support the hypothesis that COVID-19 has a multi-system impact on human cognition.

19.10.2020	Attributes and predictors of Long-COVID: analysis of COVID cases and their symptoms collected by the Covid Symptoms Study App	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> Analyses data from 4182 incident cases of COVID-19 who logged their symptoms prospectively in the COVID Symptom Study app. A total of 558 (13.3%) had symptoms lasting >28 days, 189 (4.5%) for >8 weeks and 95 (2.3%) for >12 weeks. Long-COVID was characterised by symptoms of fatigue, headache, dyspnoea and anosmia and was more likely with increasing age, BMI and female sex. Experiencing more than five symptoms during the first week of illness was associated with Long-COVID, OR=3.53 [2.76;4.50]. This model to predict long-COVID at 7 days, which gained a ROC-AUC of 76%, was replicated in an independent sample of 2472 antibody positive individuals.
14.10.2020	Residual clinical damage after COVID-19: A retrospective and prospective observational cohort study	PLoS One / Article	<ul style="list-style-type: none"> Study of 185 Italian Emergency Dept patients to investigate whether COVID-19 leaves behind residual dysfunction, and identify patients who might benefit from post-discharge monitoring. At follow-up evaluation, 58 (31.3%) patients were dyspnoeic, 41 (22.2%) tachypnoeic, 10 (5.4%) malnourished, 106 (57.3%) at risk for malnutrition. Forty (21.6%) patients had uncontrolled BP requiring therapeutic change, and 47 (25.4%) new-onset cognitive impairment. PTSD was observed in 41 (22.2%) patients. Study suggests COVID-19 leaves behind physical and psychological dysfunctions, whose underestimation may be costly in terms of long-term morbidity and mortality. Multidisciplinary follow-up of these patients is therefore crucial to avoid a second wave of late health problems associated with this pandemic.

Epidemiology and clinical – other

Publication Date	Title / URL	Journal / Article type	Digest
01.10.2020	Evolution and effects of COVID-19 outbreaks in care homes: a population analysis in 189 care homes in one geographical region of the UK	Lancet Healthy Longevity / Article	<ul style="list-style-type: none"> Describes the evolution of outbreaks of COVID-19 in all care homes in one large health region in Scotland. Between Mar 10 and Aug 2, 2020, residents at 189 care homes (5843 beds) were tested for COVID-19 when symptomatic. A COVID-19 outbreak was confirmed at 69 (37%) care homes, of which 66 (96%) were care homes for older people. The size of care homes for older people was strongly associated with a COVID-19 outbreak (odds ratio per 20-bed increase 3.35, 95% CI 1.99–5.63).
21.10.2020	COVID-19 associated invasive aspergillosis: data from the UK National Mycology Reference Laboratory	J Clin Microbiol / Article	<ul style="list-style-type: none"> Extensive testing of 1267 serum and respiratory samples from 719 critically ill UK patients with COVID-19 and suspected pulmonary aspergillosis, and 46 isolates of <i>Aspergillus fumigatus</i> from COVID-19 patients (including three that exhibited environmental triazole resistance) is discussed.

			<ul style="list-style-type: none"> • For a subset of 61 patients, respiratory specimens (bronchoalveolar lavages, tracheal aspirates, sputum samples) in addition to serum samples were submitted and tested. • Incidence of probable/proven and possible COVID-19 associated pulmonary aspergillosis (CAPA) in this subset of patients was approximately 5% and 15%, respectively. • Suggests the importance of a multi-modal diagnostic approach involving regular and repeat testing of both serum and respiratory samples.
23.10.2020	Aspergillosis Complicating Severe Coronavirus Disease	Emerg Infect Dis / Synopsis	<ul style="list-style-type: none"> • Recently, coronavirus disease–associated pulmonary aspergillosis (CAPA) has been detected through rapid reports, primarily from centres in Europe. • Authors provide a case series of CAPA, adding 20 cases to the literature, with review of pathophysiology, diagnosis, and outcomes.

Infection control / non-pharmaceutical interventions

Publication Date	Title / URL	Journal / Article type	Digest
23.10.2020	Mitigating a COVID-19 Outbreak Among Major League Baseball Players - United States, 2020	MMWR Morb Mortal Wkly Rep / Article	<ul style="list-style-type: none"> • During the 2020 season, Major League Baseball instituted a multi-layered COVID-19 prevention and mitigation strategy. • In an outbreak among 20 baseball players and staff members on a single team, no secondary transmission during field play between two opposing teams occurred. Interactions outside of game play were the likely source of transmission within the team. • Adherence to COVID-19 mitigation measures on and off the field has important implications for infection prevention in comparable sports teams, including professional, amateur collegiate, high school, and club baseball and softball teams.
17.10.2020	Mass screening of healthcare personnel for SARS-CoV-2 in the northern emirates	J Hosp Infect / Article	<ul style="list-style-type: none"> • Study to evaluate effectiveness of universal staff screening for COVID-19. Staff invited to screen three times between 3rd April and 14th May, regardless of symptoms. • Proportion of asymptomatic COVID-19 cases supports utility of universal screening of healthcare personnel (HCP). • Long term mass screening seems unsustainable; targeted screening for high-risk groups might be an alternative in the second wave of COVID-19.

Treatment

Publication Date	Title / URL	Journal / Article type	Digest
21.10.2020	Efficacy of Tocilizumab in Patients Hospitalized with Covid-19	N Engl J Med / Article	<ul style="list-style-type: none"> • Randomized, double-blind, placebo-controlled trial: 243 patients with severe COVID-19, hyperinflammatory states, and at least two of following signs: fever (body temperature >38°C), pulmonary infiltrates, or need for supplemental oxygen to maintain an oxygen saturation greater than 92%. • Hazard ratio for intubation or death in tocilizumab group compared with placebo group was 0.83 (95% confidence interval [CI], 0.38 to 1.81; P=0.64); hazard ratio for disease worsening was 1.11 (95% CI, 0.59 to 2.10; P=0.73). • Tocilizumab was not effective for preventing intubation or death in moderately ill hospitalized COVID-19 patients. Some benefit or harm cannot be ruled out, because the confidence intervals for efficacy comparisons were wide.

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
22.10.2020	What to expect for the influenza season 2020/21 with the ongoing COVID-19 pandemic in the World Health Organization European Region	Eurosurveillance / Editorial
22.10.2020	Double threat of COVID-19 and influenza	Lancet Respiratory Medicine / News
23.10.2020	Physical distancing in schools for SARS-CoV-2 and the resurgence of rhinovirus	Lancet Respiratory Medicine / Correspondence
21.10.2020	The Missing Piece - SARS-CoV-2 Testing and School Reopening	N Engl J Med / Perspective
21.10.2020	Will covid-19 vaccines save lives? Current trials aren't designed to tell us	BMJ / Feature
22.10.2020	Clinical Endpoints for Evaluating Efficacy in COVID-19 Vaccine Trials	Ann Intern Med / Article
21.10.2020	The Challenges of Expanding Rapid Tests to Curb COVID-19	JAMA / Medical News & Perspectives
20.10.2020	Ethical Framework for Assessing Manual and Digital Contact Tracing for COVID-19	Ann Intern Med / Article

Produced by the PHE COVID-19 Literature Digest Team

To sign-up, email COVID.LitDigest@phe.gov.uk

A selection of previous digests [can be found here](#)

www.gov.uk/phe Follow us on Twitter @PHE_uk
Protecting and improving the nation's health