



COVID-19 Literature Digest – 02/11/2020

OFFICIAL

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a report three times per week (Mon, Wed, Fri), which includes both preliminary reports of work (preprints) that have NOT been peer-reviewed and research that has been subject to peer review and wider scrutiny.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,

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On behalf of the PHE COVID-19 Literature Digest Team

Report for 02.11.2020 (please note that papers that have **NOT been peer-reviewed** are highlighted in red).

Sections:

[Serology and immunology](#)

[Diagnostics](#)

[Genomics](#)

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

[Epidemiology and clinical – risk factors](#)

[Epidemiology and clinical – other](#)

Serology and immunology

Publication Date	Title / URL	Journal / Article type	Digest
22.10.2020	COVID-19 and lombardy: TESTING the impact of the first wave of the pandemic	EBioMedicine / Article	<ul style="list-style-type: none"> • Cross-sectional study to assess prevalence of SARS-CoV-2 infection in 423 workers in Italian province of Bergamo, plus presence of anti-SARS-CoV-2 antibodies. • 38.5% positive subjects, of whom 51.5% were positive for both IgG and IgM, 47.3% were positive only for IgG, but only 1.2% were positive for IgM alone. • Only 23 (5.4%) participants tested positive by rRT-PCR, with high cycle thresholds (between 34 and 39), indicating a very low residual viral load that was not able to infect cultured cells. All these rRT-PCR positive subjects had already experienced seroconversion. • When the ELISA was used as the comparator, the estimated specificity and sensitivity of the rapid LFIA for IgG were 98% and 92%, respectively.
29.10.2020	Quantification of antibody avidities and accurate detection of SARS-CoV-2 antibodies in serum and saliva on plasmonic substrates	Nat Biomed Eng / Article	<ul style="list-style-type: none"> • Antibody assay detected immunoglobulin M in 87% (52 of 60) COVID-19-positive serum samples collected 6 or more days after symptom onset; correctly classified 456 out of the 457 COVID-19-negative serum samples tested (424 of them collected before the pandemic, including 73 that were positive for other viruses). • Antibody-avidity assay used to study antibody-maturation patterns, anamnestic responses, and cross-immunity to the common-cold coronaviruses.
28.10.2020	Durable SARS-CoV-2 B cell immunity after mild or severe disease	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Authors analysed S protein receptor binding domain (S-RBD)-specific memory B cells (MBC) in cohorts of ambulatory COVID-19 patients with mild disease, and hospitalised patients with moderate to severe disease, at a median of 54 (39-104) days after onset of symptoms. • Data suggests most SARS-CoV-2-infected individuals develop S-RBD-specific, class-switched MBC that phenotypically resemble germinal centre-derived B cells induced by effective vaccination against other pathogens, providing evidence for durable B cell-mediated immunity against SARS-CoV-2 after recovery from mild or severe COVID-19 disease.

Diagnostics

Publication Date	Title / URL	Journal / Article type	Digest
31.10.2020	Undetectable SARS-CoV-2 in a nasopharyngeal swab but persistent viral RNA from deep lung swabs: findings from an autopsy	BMJ Case Rep / Case report	<ul style="list-style-type: none"> • Nasal and throat swabs can be negative despite patient having typical clinical and radiological findings compatible with COVID-19. • Patient whose throat and nasal swabs (after death) were negative. A limited diagnostic autopsy was performed after 27 days, and lung swabs confirmed presence of SARS-CoV-2. • Case highlights importance of lung swabs when initial upper respiratory tract swabs are negative. Proves the virus can be detected from dead human tissue almost a month later.
30.10.2020	SARS-CoV-2 viral load is associated with increased disease severity and mortality	Nat Commun / Article	<ul style="list-style-type: none"> • Authors quantify SARS-CoV-2 viral load from diverse COVID-19 participants including hospitalized, outpatients with mild disease, individuals with resolved infection. • Detected SARS-CoV-2 plasma RNA in 27% hospitalized participants / 13% outpatients. Higher prevalence in hospitalised patients associated with worse respiratory disease severity, lower absolute lymphocyte counts, and increased markers of inflammation, including C-reactive protein and IL-6. • SARS-CoV-2 viral loads, especially plasma viremia, associated with increased risk of mortality. May aid in risk stratification of patients with COVID-19.

Genomics

Publication Date	Title / URL	Journal / Article type	Digest
30.10.2020	Genomic surveillance of COVID-19 cases in Beijing	Nat Commun / Article	<ul style="list-style-type: none"> • Present genomic surveillance data on 102 imported cases, which account for 17.2% of the total cases in Beijing. • Beijing cases broadly classified into three groups: Wuhan exposure, local transmission or overseas imports. • Imported group: higher genomic diversity, indicating continuous genomic evolution during global transmission; region-specific single nucleotide polymorphisms (SNPs). • Detection of cases at immigration with mandatory quarantine may be an effective way to prevent recurring outbreaks triggered by imported cases. • Authors also identify a set of novel indels. Data implies that SARS-CoV-2 genomes may have high mutational tolerance.

Epidemiology and clinical – children / pregnancy

Publication Date	Title / URL	Journal / Article type	Digest
29.10.2020	Baseline characteristics, management, and outcomes of 55,270 children and adolescents diagnosed with COVID-19 and 1,952,693 with influenza in France, Germany, Spain, South Korea and the United States: an international network cohort study	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Analysis of an international cohort (France, Germany, Spain, South Korea, USA) of 55,270 children/adolescents diagnosed and 3,693 hospitalised with COVID-19, and 1,952,693 diagnosed with influenza. • Despite negligible fatality, complications including pneumonia, ARDS and MIS-C were more frequent in children/adolescents with COVID-19 than with influenza. • Dyspnea, anosmia and gastrointestinal symptoms could help differential diagnosis.

Epidemiology and clinical – risk factors

Publication Date	Title / URL	Journal / Article type	Digest
30.10.2020	Transmission of SARS-COV-2 Infections in Households — Tennessee and Wisconsin, April–September 2020	MMWR Morb Mortal Wkly Rep / Early release	<ul style="list-style-type: none"> • To assess household transmission, a case-ascertained study was conducted in Nashville, Tennessee, and Marshfield, Wisconsin, commencing in Apr 2020. • A total of 191 enrolled household contacts of 101 index patients reported having no symptoms on the day of the associated index patient’s illness onset, and among these 102 had SARS-CoV-2 detected in nasal/saliva specimens during follow-up, for a secondary infection rate of 53% (95% confidence interval [CI] = 46%–60%). • Among 14 households in which the index patient was aged <18 years, the secondary infection rate from index patients aged <12 years was 53% (95% CI = 31%–74%) and from index patients aged 12–17 years was 38% (95% CI = 23%–56%). • Findings indicate that transmission of SARS-CoV-2 among household members was frequent from either children or adults.
30.10.2020	Laboratory Findings Associated With Severe Illness and Mortality Among Hospitalized Individuals With Coronavirus Disease 2019 in Eastern Massachusetts	JAMA Netw Open / Original investigation	<ul style="list-style-type: none"> • Retrospective cohort study of all (2511) individuals hospitalized for COVID-19, across 6 Eastern Massachusetts hospitals - using hospital course, prior diagnoses, and laboratory values in emergency department and inpatient settings. • L1-regression models developed in 3 hospitals yielded an area under receiver operating characteristic curve of 0.807 for severe illness and 0.847 for mortality in those hospitals. In total, 212 of 292 deaths (72.6%) occurred in the highest-risk mortality quintile. • Specific admission laboratory studies in concert with sociodemographic features and prior diagnosis facilitated risk stratification among hospitalized individuals.

28.10.2020	Clinical Suspicion of COVID-19 in Nursing Home residents: symptoms and mortality risk factors	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • In a sample of Dutch nursing home (NH) residents with clinically-suspected COVID-19 (N=4007), COVID-19 was confirmed in 1538 residents (38%). • Although symptomatology overlapped between residents with COVID-19+ and COVID-19-, those with COVID-19+ were three times more likely to die within 30 days (hazard ratio (HR), 3·1; 95% CI, 2·7 to 3·6). • Mortality was higher for men than for women (HR, 1·8; 95%, 1·5-2·2) and higher mortality was observed for residents with dementia, reduced kidney function and Parkinson's Disease, even when corrected for age, gender, and comorbidities.
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Epidemiology and clinical – other

Publication Date	Title / URL	Journal / Article type	Digest
30.10.2020	COVerAGE-DB: A database of age-structured COVID-19 cases and deaths	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Describes an open access database (COVerAGE-DB) produced by an international team of over 60 researchers, which includes cumulative counts of confirmed COVID-19 cases, deaths, and tests by age and sex. • Still in development, the database currently includes 87 countries, and 195 sub-national areas. • Cumulative counts of COVID-19 cases, deaths, and tests are recorded daily (when possible) since Jan 2020.

Infection control / non-pharmaceutical interventions

Publication Date	Title / URL	Journal / Article type	Digest
30.10.2020	Preventing the Transmission of COVID-19 in Older Adults Aged 60 Years and Above Living in Long-Term Care	University of Calgary / Rapid review update	<ul style="list-style-type: none"> • This is an update of a previous rapid review. • Infection prevention measures identified included: social distancing and isolation, PPE use and hygiene practices, screening, training and staffing policies. • The use of PPE, laboratory screening tests, sick pay to staff, self-confinement of staff within the LTCFs for 7 or more days, maintaining maximum residents' occupancy, training and social distancing significantly reduced the prevalence of COVID-19 infection among residents and/or staff of LTCFs ($p<0.05$). • Practices such as hiring of temporary staff, not assigning staff to care separately for infected and uninfected residents, inability to isolate sick residents and infrequent cleaning of communal areas significantly increased the prevalence of infection among residents and/or staff of LTCFs ($p<0.05$).

Treatment

Publication Date	Title / URL	Journal / Article type	Digest
30.10.2020	Unfractionated heparin inhibits live wild-type SARS-CoV-2 cell infectivity at therapeutically relevant concentrations	Br J Pharmacol / Research paper	<ul style="list-style-type: none">• 7 heparin preparations including nebulised unfractionated heparin (UFH) and low molecular weight heparins (LMWH) were screened for antiviral activity against live SARS-CoV-2.• UFH preparations had potent antiviral effects, with IC50 values ranging between 25-41 µg ml⁻¹. LMWHs less inhibitory by ~150-fold (IC50 range 3.4 – 7.8 mg ml⁻¹).• Comparison of clinically relevant heparins shows UFH has significantly stronger SARS-CoV-2 antiviral activity compared to LMWHs.• UFH acts to directly inhibit binding of spike protein to the human ACE2 protein receptor. Further clinical investigation of UFH as a potential treatment is needed.

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
30.10.2020	Immunoassays for anti-SARS-CoV-2 antibodies: recent insights	Lancet Infectious Diseases / Correspondence
02.11.2020	Innovation in wastewater near-source tracking for rapid identification of COVID-19 in schools	Lancet Microbe/ Comment
27.10.2020	Maintaining confidentiality of emerging results in COVID-19 vaccine trials is essential	Lancet / Comment
05.10.2020	Is visiting [in the social context] associated with increased incidence of COVID-19 in long-term residential care facilities?	NHLKS / Evidence summary

Produced by the PHE COVID-19 Literature Digest Team

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