Public Health England

COVID-19 Literature Digest – 25/11/2020

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, contain new data, insights or emerging trends. The Digest Team generate a report three times per week (Mon, Wed, Fri). The reports include both preprints, which should be treated with caution as they are NOT peer-reviewed and may be subject to change, and also research that has been subject to peer review and wider scrutiny.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Report for 25.11.2020 (please note that papers that have **NOT been peer-reviewed** are highlighted in red).

Sections:

Treatment
Guidance and consensus statements (no digest)
Overviews, comments and editorials (no digest)

Serology and immunology

Publication Date	Title / URL	Journal / Article type	Digest
24.11.2020	Estimated SARS-CoV-2 Seroprevalence in the US as of September 2020	JAMA Intern Med / Original investigation	• 177 919 serum samples tested, during 4 time periods. In 42 of 49 jurisdictions with sufficient samples, fewer than 10% people had detectable SARS-CoV-2 antibodies. Seroprevalence estimates varied between sexes, across age groups, and between metropolitan/nonmetropolitan areas. • This cross-sectional study found that as of Sept 2020, most persons in US did not have serologic evidence of previous SARS-CoV-2 infection, although prevalence varied widely by jurisdiction. • Biweekly nationwide testing of commercial clinical laboratory sera can play an important role in helping track the spread of SARS-CoV-2 in the US.
20.11.2020	Long-Term Persistence of Spike Antibody and Predictive Modeling of Antibody Dynamics Following Infection with SARS-CoV-2	medRxiv (non-peer reviewed) / Article	• Prospective cohort study of healthcare workers re. duration and dynamics of antibody responses following infection. 1163 samples from 349 participants who were symptomatic, seropositive by the MSD assay, and were followed up with 2 or more monthly samples. • At 200 days post symptom onset, 99% of participants had detectable S-antibody whereas only 75% of participants had detectable N-antibody. • Strong positive correlation between antibody titres to S-protein and blocking of the ACE-2 receptor in-vitro [R2=0.72, p<0.001]. By contrast, the N-antibody waned rapidly with a half-life of 60 days [95% CI 52-68]. • Diagnostic tests relying on N-antibody as a measure of seroprevalence must be interpreted with caution. The long-term persistence of the S-antibody, together with the strong positive correlation between the S-antibody and viral surrogate neutralization in-vitro, has important implications for the duration of functional immunity following SARS-CoV-2 infection.

Vaccine development

Publication Date	Title / URL	Journal / Article type	Digest
24.11.2020	Second interim analysis of clinical trial data showed a 91.4% efficacy for the Sputnik V	Spudnik V / Press release	• The efficacy of the Sputnik V vaccine is 91.4%, based on the second interim analysis of data obtained 28 days after administering the first dose (7 days after the second

	vaccine on day 28 after the first dose; vaccine efficacy is over 95% 42 days after the first dose		dose). • Preliminary data from volunteers obtained 42 days after the first dose (corresponds with 21 days after the second dose) indicates an efficacy of the vaccine above 95%. • Currently, 40,000 volunteers are taking part in the Phase III double-blind, randomized, placebo-controlled clinical post-registration study of the Sputnik V vaccine in Russia, of whom more than 22,000 volunteers were vaccinated with the first dose and more than 19,000 volunteers with the first and second doses. • There were no unexpected adverse events during the trials. Monitoring of the participants is ongoing.

Diagnostics and genomics

Publication Date	Title / URL	Journal / Article type	Digest
20.11.2020	Test sensitivity is secondary to frequency and turnaround time for COVID-19 screening	Sci Adv / Article	• Authors model effectiveness of repeated population screening considering test sensitivities, frequency, and sample-to-answer reporting time. • Demonstrate that effective screening depends largely on frequency of testing and speed of reporting; only marginally improved by high test sensitivity. • Screening should prioritize accessibility, frequency, and sample-to-answer time; analytical limits of detection should be secondary.
24.11.2020	Estimating the effectiveness of routine asymptomatic PCR testing at different frequencies for the detection of SARS-CoV-2 infections	medRxiv (non-peer reviewed) / Article	• A Bayesian statistical model was applied to a dataset of twice weekly PCR tests of UK healthcare workers performed by self-administered nasopharyngeal swab, regardless of symptoms. • Data suggests the probability that the PCR test detected infection peaked at 77% (54-88%) 4 days after infection, decreasing to 50% (38-65%) by 10 days after infection. • Suggests a substantially higher probability of detecting infections 1-3 days after infection than previously published estimates. • Estimates that testing every other day would detect 57% (33-76%) of symptomatic cases prior to onset and 94% (75-99%) of asymptomatic cases within 7 days if test results were returned within a day. • Results suggest that routine asymptomatic testing can enable detection of a high proportion of infected individuals early in their infection, provided that the testing is frequent and the time from testing to notification of results is sufficiently fast.
20.11.2020	Diagnostic accuracy of two commercial SARS-CoV-2 Antigen-detecting rapid tests at the	medRxiv (non-peer reviewed) / Article	• A single-centre, point of care validation (1064 participants) of two antigen-detecting rapid diagnostic tests (Ag-RDT) in comparison to RT-PCR on nasopharyngeal swabs.

	point of care in community-based testing centers		• The PanbioTM Covid-19 Ag Rapid Test device (Abbott) was validated in 535 participants, with 106 positive Ag-RDT results out of 124 positive RT-PCR individuals, yielding a sensitivity of 85.5%. Specificity was 100.0% in 411 RT-PCR negative individuals. • The Standard Q Ag-RDT (SD Biosensor, Roche) was validated in 529 participants, with 170 positive Ag-RDT results out of 191 positive RT-PCR individuals, yielding a sensitivity of 89.0%. One false positive result was obtained in 338 RT-PCR negative individuals, yielding a specificity of 99.7%. • For individuals presenting with fever 1-5 days post symptom onset, combined Ag-RDT sensitivity was above 95%.
23.11.2020	Genomic epidemiology of superspreading events in Austria reveals mutational dynamics and transmission properties of SARS-CoV-2	Sci Transl Med / Article	• Authors provide a national-scale analysis of SARS-CoV-2 superspreading during first wave of infections in Austria; deep whole-genome sequencing of 500+ virus samples from first wave. • Phylogenetic-epidemiological analysis enabled reconstruction of superspreading events and charts a map of tourism-related viral spread originating from Austria in spring 2020. • Via epidemiologically well-defined clusters, quantify SARS-CoV-2 mutational dynamics, including observation of a low-frequency mutation that progressed to fixation within the infection chain. • Study unveiled viral mutation dynamics within individuals with COVID-19, and epidemiologically validated infector-infectee pairs to determine an average transmission bottleneck size of 103 SARS-CoV-2 particles.

Epidemiology and clinical – children / pregnancy

Publication Date	Title / URL	Journal / Article type	Digest
23.11.2020	Assessment of 135 794 Pediatric Patients Tested for Severe Acute Respiratory Syndrome Coronavirus 2 Across the United States	JAMA Pediatr / Original research	• In this cohort study using electronic health records for 135 794 US paediatric patients in 7 children's health systems, 96% of patients tested had negative results, and rates of severe cardiorespiratory presentation of COVID-19 illness were low. • Minority race/ethnicity, chronic illness, and increasing age were associated with SARS-CoV-2 infection.

Epidemiology and clinical – risk factors

Publication Date	Title / URL	Journal / Article type	Digest
24.11.2020	Risk Factors for SARS-CoV-2 in a Statewide Correctional System	N Engl J Med / Article	• Conducted both symptom-based and mass testing by RT-PCR (Quest Diagnostics) to detect SARS-CoV-2 infection among incarcerated persons in the Connecticut state-wide correctional system (prisons and jails combined) from Mar 13, 2020, when the first case of Covid-19 was identified in the correctional system, through June 26, 2020. • Among the 1240 SARS-CoV-2–positive men (approximately 13% of the male population in the system), there were 62 hospitalizations, 20 ICU admissions, and 7 deaths. • Risk factors for SARS-CoV-2 infection were dormitory housing, Hispanic or Latino ethnic group, and older age (odds ratio, 1.2 per decade; 95% CI, 1.2 to 1.3). • Predictors of hospitalization were heart disease, dormitory housing, and older age. Predictors of ICU admission were heart disease, autoimmune disease, and older age. Older age was the only predictor of death.
24.11.2020	Surviving COVID-19 After Hospital Discharge: Symptom, Functional, and Adverse Outcomes of Home Health Recipients	Ann Intern Med / Original research	• Study 1409 COVID-19 patients in New York admitted to home health care (HHC) between 1 Apr and 15 June 2020 after hospitalization. • Symptom burden and functional dependence were common at the time of HHC admission but improved for most patients. • Higher risk for rehospitalization or death included: male patients (HR, 1.45 [CI, 1.04 to 2.03]); White patients (HR, 1.74 [CI, 1.22 to 2.47]); patients with heart failure (HR, 2.12 [CI, 1.41 to 3.19]), diabetes with complications (HR, 1.71 [CI, 1.17 to 2.52]), cognitive impairment (HR, 1.49 [CI, 1.04 to 2.13]), or functional dependencies (HR, 1.09 [CI, 1.00 to 1.20]). • Comorbid conditions of heart failure and diabetes, as well as characteristics present at admission, identified patients at greatest risk for an adverse event.
20.11.2020	The risk of COVID hospital admission and COVID mortality during the first COVID 19 wave with a special emphasis on Ethnic Minorities: an observational study of a single, deprived, multi ethnic UK health economy	medRxiv (non-peer reviewed) / Article	• Observational study of COVID-19 outcomes in 5558 patients from a single UK hospital serving a relatively deprived area with an ethnically diverse feeder population of 228,632 adults. • Age, gender, multi-morbidity and Black ethnicity (OR 2.1, p<0.001, absolute excess risk of <1/1,000) were associated with COVID-19 admission and mortality. • The South Asian cohort had lower COVID-19 admissions (CA) and non-COVID-19 admissions (NCA), lower mortality (CA (0.5, p<0.01), NCA (0.4, p<0.001), community deaths (0.5, p<0.001). • Despite many common risk factors for CA and NCA, ethnic groups had different admission rates, and within-groups differing association of risk factors.

			• Deprivation impacted only in White ethnicity, in the oldest age bracket and in a lesser (not most) deprived quintile.
23.11.2020	First flare of ACPA-positive rheumatoid arthritis after SARS-CoV-2 infection	Lancet Rheumatology / Comment	• To the best of authors knowledge, this is the first definitive case of ACPA-positive rheumatoid arthritis developing after SARS-CoV-2 infection (i.e., with samples taken before and after arthritis onset), with infection as a potential trigger for epitope spreading and onset of clinical rheumatoid arthritis symptoms.

Epidemiology and clinical – other

Publication Date	Title / URL	Journal / Article type	Digest
23.11.2020	ISARIC COVID-19 Clinical Data Report: 20 November 2020	medRxiv (non-peer reviewed) / Article	• Presents findings for 95,966 cases (Median age 72 years) who met eligibility criteria for this latest report. • Twenty percent of patients were admitted to an ICU at some point during their illness. • Antibiotic use is high (81.9% of patients). • Fever, shortness of breath, a non-productive cough and fatigue were the most common symptoms. • Altered consciousness/confusion was also relatively frequent (20,802/95,079) and most common in elderly patients. • Overall, elderly patients are less likely to present with upper respiratory tract infection symptoms.
23.11.2020	A case of SARS-CoV-2 reinfection in Ecuador	Lancet Infectious Diseases / Correspondence	• Here the authors report the first confirmed case of SARS-CoV-2 reinfection in Ecuador and South America (46 yo man). • The symptoms were more severe upon reinfection and included odynophagia, nasal congestion, fever of 38·5°C, back pain, productive cough, and dyspnoea. • Phylogenetic analysis revealed that the first infection variant belonged to clade 20A and lineage B1.p9, whereas the second infection variant belonged to clade 19B and lineage A.1.1. • No shared mutations were observed between the two sequences, further suggesting that both variants resulted from distinct evolutionary trajectories. • Interestingly, the antibody test performed during the first infection event showed the presence of specific anti-SARS-CoV-2 IgM and no IgG. However, it is not possible using conventional antibody tests to determine whether a protective immune response developed.
24.11.2020	Association Between ABO and Rh Blood Groups and SARS-CoV-2 Infection or Severe	Ann Intern Med / Original research	• Population-based cohort study: 225 556 persons (adults / children) who had ABO blood group assessed Jan 2007 - Dec 2019 and subsequently SARS-CoV-2 testing between 15 Jan - 30 June 2020.

	COVID-19 Illness : A Population-Based Cohort Study		• Rhesus-negative (Rh−) blood type protective against SARS-CoV-2 infection (aRR, 0.79 [CI, 0.73 to 0.85]; ARD, −6.8 per 1000 [CI, −8.9 to −4.7]), especially for O-negative (O−) (aRR, 0.74 [CI, 0.66 to 0.83]; ARD, −8.2 per 1000 [CI, −10.8 to −5.3]). • Lower risk for severe COVID-19 illness or death associated with type O blood group versus all others (aRR, 0.87 [CI, 0.78 to 0.97]; ARD, −0.8 per 1000 [CI, −1.4 to −0.2]) and with Rh− versus Rh-positive (aRR, 0.82 [CI, 0.68 to 0.96]; ARD, −1.1 per 1000 [CI, −2.0 to −0.2]). • O and Rh− blood groups may be associated with a slightly lower risk for SARS-CoV-2 infection and severe COVID-19 illness.

Infection control / non-pharmaceutical interventions

Publication Date	Title / URL	Journal / Article type	Digest
20.11.2020	Scientific Brief: Community Use of Cloth Masks to Control the Spread of SARS-CoV-2	CDC / Scientific brief	• Experimental and epidemiological data support community masking to reduce the spread of SARS-CoV-2. • The prevention benefit of masking is derived from the combination of source control and personal protection for the mask wearer. • The relationship between source control and personal protection is likely complementary and possibly synergistic, so that individual benefit increases with increasing community mask use. • Further research is needed to expand the evidence base for the protective effect of cloth masks and in particular to identify the combinations of materials that maximize both their blocking and filtering effectiveness, as well as fit, comfort, durability, and consumer appeal.
23.11.2020	Reducing travel-related SARS-CoV-2 transmission with layered mitigation measures: Symptom monitoring, quarantine, and testing	medRxiv (non-peer reviewed) / Article	• Authors model the expected effectiveness of symptom monitoring, testing, and quarantine to reduce the risk of transmission from infected travellers during and after travel. • If infection occurs 0-7 days prior to travel, immediate isolation following symptom onset prior to or during travel reduces risk of transmission while travelling by 26-30%. • For transmission risk after travel with infection time up to 7 days prior to arrival at the destination, isolation based on symptom monitoring reduced introduction risk by 42-56%. • A 14-day quarantine on arrival can reduce risk by 97-100% alone, however a quarantine of 7 days combined with symptom monitoring and a test on day 3-4 is also effective (95-99%). • To reduce introduction risk without quarantine, optimal test timing is close to the

			time of arrival; with effective quarantine after arrival, testing a few days later optimises sensitivity.

Treatment

Publication Date	Title / URL	Journal / Article type	Digest
21.11.2020	Coronavirus (COVID-19) Update: FDA Authorizes Monoclonal Antibodies for Treatment of COVID-19	US FDA / New release	• The U.S. FDA issued an emergency use authorization (EUA) for casirivimab and imdevimab to be administered together for the treatment of mild to moderate COVID-19 in adults and paediatric patients (12 years of age or older weighing at least 40 kilograms [about 88 pounds]) with positive results of direct SARS-CoV-2 viral testing and who are at high risk for progressing to severe COVID-19. • In a clinical trial of patients with COVID-19, casirivimab and imdevimab, administered together, were shown to reduce COVID-19-related hospitalization or emergency room visits in patients at high risk for disease progression within 28 days after treatment when compared to placebo. • Casirivimab and imdevimab are not authorized for patients who are hospitalized due to COVID-19 or require oxygen therapy due to COVID-19. • The safety and effectiveness of this investigational therapy for use in the treatment of COVID-19 continues to be evaluated.
24.11.2020	A Randomized Trial of Convalescent Plasma in Covid-19 Severe Pneumonia	N Engl J Med / Article	• Hospitalized adult patients with severe Covid-19 pneumonia randomly assigned in 2:1 ratio to receive convalescent plasma (228 patients) or placebo (105 patients). Review clinical status 30 days after intervention. • No significant differences were observed in clinical status or overall mortality between patients treated with convalescent plasma and those who received placebo.
24.11.2020	A Cluster-Randomized Trial of Hydroxychloroquine for Prevention of Covid-19	N Engl J Med / Article	• Conducted an open-label, cluster-randomized trial involving asymptomatic contacts of patients with PCR–confirmed Covid-19 in Catalonia, Spain. • The analysis included 2314 healthy contacts of 672 index case patients with Covid-19 who were identified between Mar 17 and Apr 28, 2020. A total of 1116 contacts were randomly assigned to receive hydroxychloroquine and 1198 to receive usual care. • Postexposure therapy with hydroxychloroquine did not prevent SARS-CoV-2 infection or symptomatic Covid-19 in healthy persons exposed to a PCR-positive case patient.

Guidance and consensus statements

Publication Date	Title / URL	Journal / Article type
24.11.2020	Minimum standards for private sector providers of COVID-19 testing for 'Testing to Release for International Travel'	Gov.uk / Guidance

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
24.11.2020	Antibodies, Immunity, and COVID-19	JAMA Intern Med / Commentary
23.11.2020	Diagnosis, Management, and Pathophysiology of Arterial and Venous Thrombosis in COVID-19	JAMA / Insights
23.11.2020	The Advisory Committee on Immunization Practices' Ethical Principles for Allocating Initial Supplies of COVID-19 Vaccine — United States, 2020	MMWR Morb Mortal Wkly Rep / Report (early release)

Produced by the PHE COVID-19 Literature Digest Team

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