



COVID-19 Literature Digest – 23/11/2020

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 The reports include both preprints, which should be treated with caution as they are NOT peer-reviewed and may be subject to change, and also research that has been subject to peer review and wider scrutiny.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,

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On behalf of the PHE COVID-19 Literature Digest Team

Report for 23.11.2020 (please note that papers that have **NOT been peer-reviewed** are highlighted in red).

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Serology and immunology

Publication Date	Title / URL	Journal / Article type	Digest
19.11.2020	Multi-center nationwide comparison of seven serology assays reveals a SARS-CoV-2 non-responding seronegative subpopulation	EClinicalMedicine / Article	<ul style="list-style-type: none">• An Israeli national taskforce performed a multi-centre clinical and analytical validation of seven serology assays to determine their utility and limitations for SARS-CoV-2 diagnosis.• Serology assays from Roche, Abbott, Diasorin, BioMerieux, Beckman-Coulter, Siemens, and Mt.-Sinai ELISA were included. Negative samples from 2391 individuals representative of the Israeli population, and 698 SARS-CoV-2 PCR positive patients, collected between Mar and May 2020, were analysed.• Immunoassays sensitivities between 81.5%-89.4% and specificities between 97.7%-100% resulted in a profound impact on the expected Positive Predictive Value (PPV) in low (<15%) prevalence scenarios.• A positive correlation between disease severity and antibody titres, and no decrease in antibody titres in the first 8 weeks after PCR positivity was observed.• Identified a subgroup of symptomatic SARS-CoV-2 positive patients (~5% of patients), who remained seronegative across a wide range of antigens, isotypes, and technologies.
18.11.2020	Clinical evaluation of the Roche/SD Biosensor rapid antigen test with symptomatic, non-hospitalized patients in a municipal health service drive-through testing site	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none">• The Roche/SD Biosensor lateral flow antigen rapid test was evaluated in a mild symptomatic population (n=970) at a large drive through testing site in the Netherlands.• People with early onset and high viral load were detected with 98.2% sensitivity.• 97% of individuals in which virus could be cultured were detected by the rapid test.• Findings suggest this test is suitable to detect mild symptomatic cases.
15.11.2020	Immunological memory to SARS-CoV-2 assessed for greater than six months after infection	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none">• Authors analysed multiple compartments of circulating immune memory to SARS-CoV-2 in 185 COVID-19 cases, including 41 cases at ≥6 months post-infection.• Spike IgG was relatively stable over 6+ months.• Spike-specific memory B cells were more abundant at 6 months than at 1

			<p>month.</p> <ul style="list-style-type: none"> • SARS-CoV-2-specific CD4+ T cells and CD8+ T cells declined with a half-life of 3-5 months. • Suggests that each component of SARS-CoV-2 immune memory exhibited distinct kinetics.
17.11.2020	Rapid and lasting generation of B-cell memory to SARS-CoV-2 spike and nucleocapsid proteins in COVID-19 disease and convalescence	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • The authors analysed 36 blood samples obtained from 25 COVID-19 patients (11 paired) between 4-242 days post-symptom onset to determine the longevity and immunophenotype of SARS-CoV-2-specific long-lived memory T and B (Bmem) cells. • RBD- and NCP-specific Bmem cells persisted for 8 months, indicating that a decline in serum antibodies after 1 month does not indicate waning of immunity, but a contraction of the immune response. • Flowcytometric detection of SARS-CoV-2-specific Bmem cells enables detection of long-term functional immunity following infection or vaccination for COVID-19.

Vaccine development

Publication Date	Title / URL	Journal / Article type	Digest
23.11.2020	Oxford University breakthrough on global COVID-19 vaccine	Oxford University / News	<ul style="list-style-type: none"> • The University of Oxford, in collaboration with AstraZeneca plc, announces interim trial data from its Phase III trials that show its candidate vaccine, ChAdOx1 nCoV-2019, is effective at preventing COVID-19 (SARS-CoV-2) and offers a high level of protection. • Phase 3 interim analysis including 131 Covid-19 cases indicates that the vaccine is 70.4% effective when combining data from two dosing regimens. • Large safety database from over 24,000 volunteers from clinical trials in the UK, Brazil and South Africa, with follow up since April. • Crucially, vaccine can be easily administered in existing healthcare systems, stored at 'fridge temperature' (2-8 °C) and distributed using existing logistics. • Large scale manufacturing ongoing in over 10 countries to support equitable global access.

Epidemiology and clinical – risk factors

Publication Date	Title / URL	Journal / Article type	Digest
19.11.2020	Analysis of vitamin D level among asymptomatic and critically ill COVID-19 patients and its correlation with inflammatory markers	Sci Rep / Article	<ul style="list-style-type: none"> • Vitamin D levels were analysed in a cohort of COVID-19 patients (age 30-60) who were either asymptomatic (Group A; n=91) or severely ill and requiring ICU admission (Group B; n=63). • Mean level of vitamin D (in ng/mL) was 27.89 ± 6.21 in Group A and 14.35 ± 5.79 in Group B - a highly significant difference. • Prevalence of vitamin D deficiency was 32.96% and 96.82% respectively in Group A and Group B. • In total, 90 patients were deficient in vitamin D (Group A: 29; Group B: 61). • Fatality rate was high in vitamin D deficient patients (21% vs 3.1%), as was inflammatory response.
19.11.2020	Evaluation of the Incidence and Potential Mechanisms of Tracheal Complications in Patients With COVID-19	JAMA Otolaryngol Head Neck Surg / Original investigation	<ul style="list-style-type: none"> • Cohort study of 98 COVID-19 patients with severe respiratory failure: 30 underwent prolonged invasive mechanical ventilation (COVID-19 group). 45 patients without COVID-19 (Control). • Incidence of full-thickness tracheal lesions or tracheoesophageal fistulas after prolonged (≥ 14 days) invasive mechanical ventilation significantly higher in patients with COVID-19 (46.7%) than matched controls (2.2%). • Almost half COVID-19 patients developed full-thickness tracheal lesions and/or tracheoesophageal fistulas after prolonged invasive mechanical ventilation. Attempts to prevent these lesions should be made and quickly recognized when they occur to avoid potentially life-threatening complications in ventilated patients with COVID-19.

Epidemiology and clinical – long term complications / sequelae

Publication Date	Title / URL	Journal / Article type	Digest
21.11.2020	Comprehensive health assessment three months after recovery from acute COVID-19	Clin Infect Dis / Accepted manuscript	<ul style="list-style-type: none"> • Analysis of 124 discharged COVID-19 patients at a Dutch university medical centre (age 59 ± 14 years, 60% male) to investigate long-term health sequelae. Patients had either mild (n=27), moderate (n=51), severe (n=26) or critical disease (n=20). • Lung diffusion capacity was below lower limit of normal in 42% of patients. • Ninety-nine percent of patients had reduced ground-glass opacification on repeat CT imaging, and normal chest X-rays were found in 93% of patients with mild diseases. • Residual pulmonary parenchymal abnormalities were present in 91% of

			<p>patients, and correlated with reduced lung diffusion capacity.</p> <ul style="list-style-type: none"> • Twenty-two percent had low exercise capacity, 19% low fat-free mass index, and problems in mental and/or cognitive function were found in 36% of the patients. • Health status was generally poor, particularly in the domains functional impairment (64%), fatigue (69%) and QoL (72%).
18.11.2020	COVID-19-associated olfactory dysfunction reveals SARS-CoV-2 neuroinvasion and persistence in the olfactory system	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • A study of the olfactory system from COVID-19 patients presenting acute loss of smell suggests the olfactory epithelium (OE) is a highly significant infection site where multiple cell types, including olfactory sensory neurons, support cells and immune cells, are infected. • Viral replication in the OE is associated with local inflammation. • Demonstrates that SARS-CoV-2 induces acute anosmia and ageusia in golden Syrian hamsters, both lasting as long as the virus remains in the OE and the olfactory bulb. • Olfactory mucosa sampling in COVID-19 patients presenting with persistent loss of smell reveals the presence of virus transcripts and of SARS-CoV-2-infected cells, together with protracted inflammation. • Viral persistence in the OE provides a potential mechanism for prolonged or relapsing symptoms of COVID-19, such as loss of smell.

Epidemiology and clinical – other

Publication Date	Title / URL	Journal / Article type	Digest
13.11.2020	Pattern of SARS-CoV-2 infection among dependant elderly residents living in long-term care facilities in Marseille, France, March–June 2020	International Journal of Antimicrobial Agents / Article	<ul style="list-style-type: none"> • Data from 1691 elderly residents and 1000 members of staff retrospectively collected through interviewing the medical teams in 24 long-term care facilities (LTCFs) in Marseille, France. • 226 infected residents: 37 (16.4%) detected on a case-by-case basis due to COVID-19 symptoms; 189 (83.6%) detected through mass screening. 23.0% were asymptomatic. • Death rate positively associated with being male, aged > 85 years, receiving oxygen therapy. Negatively associated with being diagnosed through mass screening (16.9% vs. 40.5%, OR = 0.20, P = 0.001) and receiving HCQ-AZM treatment ≥ 3 days (15.5% vs. 26.4%, OR = 0.37, P = 0.02). • High proportion of asymptomatic COVID-19 patients and independent factors for mortality suggest early diagnosis and treatment of COVID-19 patients in LTCFs may be effective in saving lives.

18.11.2020	A follow-up study shows no new infections caused by patients with repeat positive of COVID-19 in Wuhan	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Epidemiological and clinical features for 20,280 COVID-19 patients from multiple centres between 31 Dec 2019 and 4 Aug 2020 in Wuhan were collected and followed, and RT-qPCR testing results for 4,079 individuals who had close contact with the patients suffering repeat positive were also obtained. • A total of 2,466 (12.16%) patients presented with a repeat positive of SARS-CoV-2 after they were discharged from hospital. • PCR results were negative for all 4,079 individuals who had close contact with these repeat positive patients.
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Transmission

Publication Date	Title / URL	Journal / Article type	Digest
20.11.2020	EMG: Potential application of air cleaning devices and personal decontamination to manage transmission of COVID-19, 4 November 2020	Gov.uk / Research and analysis	<ul style="list-style-type: none"> • Paper by the Environmental and Modelling Group on the potential application of air cleaning devices to manage transmission of COVID-19.
18.11.2020	Evidence summary on activities or settings associated with a higher risk of SARS-CoV-2 transmission	HIQA / Evidence summary	<ul style="list-style-type: none"> • Nineteen studies were included in the evidence summary; seven evidence syntheses and twelve primary research studies. • There is consistent evidence that SARS-CoV-2 clusters predominate in household settings, and that they are associated with a higher secondary attack rate (SAR) (18.1% (95% confidence interval (CI), 15.7%-20.6%)) compared with other settings (for example, estimated SAR in healthcare settings is <1%). The SAR for SARS-CoV-2 is high compared with other pandemic respiratory viruses. • Other activities or settings where large numbers of clusters have been consistently observed include nursing homes, hospitals, meat and food processing plants, large shared accommodation, sporting activities, bars, nightclubs and restaurants, gyms, offices, cruise ships, weddings, shopping malls, prisons, mines and religious settings. Many of these settings and activities have been associated with SSEs and have seeded large numbers of cases.
20.11.2020	COVID-19 Outbreak Associated with a 10-Day Motorcycle Rally in a Neighboring State — Minnesota, August–September 2020	MMWR Morb Mortal Wkly Rep / Report (early release)	<ul style="list-style-type: none"> • Following a 10-day motorcycle rally in South Dakota attended by approximately 460,000 persons, 51 confirmed primary event-associated cases, 21 secondary cases, and five tertiary cases were identified in Minnesota residents. • An additional nine likely rally-associated secondary or tertiary cases occurred. Four patients were hospitalized, and one died. • Genomic sequencing supported the associations with the motorcycle rally.

19.11.2020	Livestock plants and COVID-19 transmission	Proc Natl Acad Sci U S A / Article	<ul style="list-style-type: none"> • Study found strong relationship between U.S livestock-processing plants and local community transmission, suggesting plants act as transmission vectors into surrounding population and accelerate spread of COVID-19 - association primarily among large processing facilities and large meatpacking companies. • Authors estimate livestock plants to be associated with 236,000 to 310,000 COVID-19 cases (6 to 8% of total) and 4,300 to 5,200 deaths (3 to 4% of total) as of July 21. • Ensuring both public health and robust essential supply chains may require an increase in meatpacking oversight and potentially a shift toward more decentralized, smaller-scale meat production.
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Infection control / non-pharmaceutical interventions

Publication Date	Title / URL	Journal / Article type	Digest
20.11.2020	Trends in County-Level COVID-19 Incidence in Counties With and Without a Mask Mandate — Kansas, June 1–August 23, 2020	MMWR Morb Mortal Wkly Rep / Report (early release)	<ul style="list-style-type: none"> • The governor of Kansas issued an executive order requiring wearing masks in public spaces, effective July 3, 2020, which was subject to county authority to opt out. • After July 3, COVID-19 incidence decreased in 24 counties with mask mandates but continued to increase in 81 counties without mask mandates. • Countywide mask mandates appear to have contributed to the mitigation of COVID-19 transmission in mandated counties. Community-level mitigation strategies emphasizing use of masks, physical distancing, staying at home when ill, and enhanced hygiene practices can help reduce the transmission of SARS-CoV-2.
20.11.2020	Post-lockdown SARS-CoV-2 nucleic acid screening in nearly ten million residents of Wuhan, China	Nat Commun / Article	<ul style="list-style-type: none"> • Stringent COVID-19 control measures imposed in Wuhan Jan 23 - Apr 8. Prevalence of SARS-CoV-2 infection was very low five to eight weeks after end of lockdown. • City-wide SARS-CoV-2 nucleic acid screening programme between May 14 and June 1, 2020 in Wuhan. All city residents aged six years or older were eligible and 9,899,828 (92.9%) participated. • No new symptomatic cases / 300 asymptomatic cases (detection rate 0.303/10,000, 95% CI 0.270–0.339/10,000) identified. No positive tests amongst 1,174 close contacts of asymptomatic cases. • 107 of 34,424 previously recovered COVID-19 patients tested positive again (re-positive rate 0.31%, 95% CI 0.423–0.574%).

13.11.2020	Analysis of the SARS-CoV-2 epidemic in Italy: The role of local and interventional factors in the control of the epidemic	PloS one / Article	<ul style="list-style-type: none"> • Analysis of the first wave of the SARS-CoV-2 epidemic throughout Italy, from detection of the first indigenous cases to day 81 (6 days after the end of the strict lockdown). • At day eighty-one, 219,070 cases (363 in 100,000 persons) were diagnosed. • The 21 Italian Regions and autonomous Provinces showed a wide range in the frequency of cases (58-921, median 258 in 100,000 persons) and total predicted cases (58-946, median 267 in 100,000 persons) at day 81. • Predicted time for the end of the wave was highly variable, ranging from 64 to 136 (median 99) days. • Number of cases correlated inversely with distance from the area in which first cases were detected, and also with GDP per capita (as a marker of industrial activity) of the Region. • An earlier start of the lockdown (i.e. in the presence of a lower number of cases) and wider testing were associated with a lower final number of total cases.
20.11.2020	Physical interventions to interrupt or reduce the spread of respiratory viruses	Cochrane Database Syst Rev / Review	<ul style="list-style-type: none"> • 44 new RCTs and cluster-RCTs included in this update (review first published in 2007), bringing total number of randomised trials to 67. No studies conducted during the COVID-19 pandemic. • Uncertainty about effects of face masks. Pooled results of randomised trials did not show a clear reduction in respiratory viral infection with use of medical/surgical masks during seasonal influenza. • No clear differences between use of medical/surgical masks compared with N95/P2 respirators in healthcare workers when used in routine care to reduce respiratory viral infection. • Hand hygiene is likely to modestly reduce the burden of respiratory illness. Harms associated with physical interventions were under-investigated.

Treatment

Publication Date	Title / URL	Journal / Article type	Digest
20.11.2020	Update to living WHO guideline on drugs for covid-19	Bmj / Practice	<ul style="list-style-type: none"> • This living guideline by Lamontagne and colleagues (BMJ 2020;370:m3379) has been updated. • The latest version of this WHO living guidance focuses on remdesivir, following the 15 Oct 2020 preprint publication of results from the WHO SOLIDARITY trial. It contains a weak or conditional recommendation against the use of remdesivir in hospitalised patients with covid-19.

Modelling

Publication Date	Title / URL	Journal / Article type	Digest
23.11.2020	Updated projections of COVID-19 in the EU/EEA and the UK	European Centre for Disease Prevention and Control / Technical report	<ul style="list-style-type: none"> • In May 2020, ECDC produced a set of short-term forecasts of the expected number of COVID-19 cases, deaths and hospitalised cases (subdivided into general hospital wards and intensive care units). • Updated forecasts were published in Sept 2020. • In this report they present slightly longer-term projections for each country, up until 25 Dec 2020.
20.11.2020	Modeling the frequency and number of persons to test to detect and control COVID-19 outbreaks in congregate settings	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • CDC study which used transmission modelling to estimate the minimum number of persons to test and the optimal frequency to detect small outbreaks of COVID-19 in a congregate facility. • In a facility of 100 people, 26 randomly selected individuals would need to be tested at least every 6 days to identify a true underlying prevalence of at least 5%, with test sensitivity of 85%, and greater than 95% outbreak detection sensitivity. • Disease transmission could be interrupted with universal, facility-wide testing with rapid turnaround every three days. • Concluded that testing a subset of individuals in congregate settings can improve early detection of small outbreaks of COVID-19. Frequent universal diagnostic testing can be used to interrupt transmission within a facility, but its efficacy is reliant on rapid turnaround of results for isolation of infected individuals.

Guidance and consensus statements

Publication Date	Title / URL	Journal / Article type
20.11.2020	COVID-19: mitigation of risks in occupational settings with a focus on ethnic minority groups	Gov.uk / Guidance
20.11.2020	COVID-19: suggested principles of safer singing	Gov.uk / Guidance

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
20.11.2020	SARS-CoV-2 and the human-animal interface: outbreaks on mink farms	Lancet Infectious Diseases / Comment

Produced by the PHE COVID-19 Literature Digest Team

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