



COVID-19 Literature Digest – 18/11/2020

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 The reports include both preprints, which should be treated with caution as they are NOT peer-reviewed and may be subject to change, and also research that has been subject to peer review and wider scrutiny.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Report for 18.11.2020 (please note that papers that have **NOT been peer-reviewed** are highlighted in red).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
17.11.2020	Secondary attack rate and family clustering of SARS-CoV-2 infection in children of healthcare workers with confirmed COVID-19	Clin Infect Dis / Accepted manuscript	<ul style="list-style-type: none"> • UK study; authors measured serum SARS-CoV-2 antibodies in 215 children of healthcare workers to estimate secondary attack rates (SAR). • 21 families had a parent with confirmed COVID-19. In children of healthcare workers with confirmed COVID-19, 20 (45.5%) of 44 children in 21 families were seropositive. • Strong evidence of family clustering (P<0.001): 20/21 (95.2%) children were seropositive in 9 families; none of 23 children in 12 other families.
13.11.2020	Dysregulated immunity in SARS-CoV-2 infected pregnant women	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Assesses the impact of SARS-CoV-2 infection during pregnancy on inflammatory and humoral responses in maternal and fetal samples, and compares antibody responses to SARS-CoV-2 among pregnant and non-pregnant women, at a hospital in Baltimore, USA. • Findings suggest SARS-CoV-2 infection during pregnancy is characterised by placental inflammation and reduced antiviral antibody responses, which may impact the efficacy of COVID-19 therapeutics in pregnancy. • The long-term implications of placental inflammation for neonatal health require greater consideration.

Vaccine development

Publication Date	Title / URL	Journal / Article type	Digest
17.11.2020	Safety, tolerability, and immunogenicity of an inactivated SARS-CoV-2 vaccine in healthy adults aged 18–59 years: a randomised, double-blind, placebo-controlled, phase 1/2 clinical trial	Lancet Infectious Diseases / Article	<ul style="list-style-type: none"> • Investigated CoronaVac (Sinovac Life Sciences, Beijing, China), an inactivated vaccine candidate against COVID-19, containing inactivated SARS-CoV-2, for its safety, tolerability and immunogenicity. • In this randomised, double-blind, placebo-controlled, phase 1/2 clinical trial, healthy adults aged 18–59 years were recruited from the community in Suining County of Jiangsu province, China. • Taking safety, immunogenicity, and production capacity into account, the 3 µg dose of CoronaVac is the suggested dose for efficacy assessment in future phase 3 trials.

16.11.2020	Analysis of SARS-CoV-2 spike glycosylation reveals shedding of a vaccine candidate	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • States that viral spikes carry glycans that facilitate immune evasion by shielding specific protein epitopes from antibody neutralisation, so immunogen integrity is important for glycoprotein-based vaccine candidates. • The authors demonstrate how site-specific glycosylation differs between virus-derived spikes and spike proteins derived from a viral vectored SARS-CoV-2 vaccine candidate. • Their distinctive cellular secretion pathways result in different protein glycosylation and secretion patterns, which may have implications for the resulting immune response and future vaccine design.
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Genomics

Publication Date	Title / URL	Journal / Article type	Digest
16.11.2020	Recurrent mutations in SARS-CoV-2 genomes isolated from mink point to rapid host-adaptation	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Screened published SARS-CoV-2 genomes isolated from minks for the presence of recurrent mutations common in mink but infrequent in SARS-CoV-2 genomes from human infections. • Identified 23 recurrent mutations including three nonsynonymous mutations in the Receptor Binding Domain of the SARS-CoV-2 spike protein that independently emerged at least four times, but are only very rarely observed in strains circulating in humans. • Repeat emergence of mutations across phylogenetically distinct lineages of the virus isolated from minks points to ongoing adaptation of SARS-CoV-2 to a new host. • Rapid acquisition and spread of SARS-CoV-2 mutations in minks suggests that if a similar phenomenon of host adaptation had occurred upon its jump into humans, those human-specific mutations would likely have reached fixation already before the first SARS-CoV-2 genomes were generated.

Epidemiology and clinical

Publication Date	Title / URL	Journal / Article type	Digest
16.11.2020	COVID-19 outcomes in UK centre within highest health and wealth band: a prospective cohort study	BMJ Open / Original research	<ul style="list-style-type: none"> • Prospective cohort study: characteristics and outcomes of UK hospitalised patients with COVID-19 in highest decile of health and gross regional products per capita.

			<ul style="list-style-type: none"> • 429 adult inpatients (mean age 70±18 years; men 56.4%): 19.1% required ICU admission, 31.9% died. Adverse outcomes associated with age (OR with each decade of years: 1.78, 95% CI 1.53 to 2.11, p<0.001 for mortality); male gender (OR=1.08, 95% CI 0.72 to 1.63, p=0.72, present in 70.7%, of admissions to ICU versus 53% of other cases, p=0.004); cardiac disease (OR=3.43, 95% CI 2.10 to 5.63, p<0.001), diabetes mellitus (OR=2.37, 95% CI 1.09 to 5.17, p=0.028) and dementia (OR=5.06, 95% CI 2.79 to 9.44, p<0.001). • No significant impact of ethnicity or body mass index on disease outcome. • Despite reports of worse outcomes in deprived regions, similar complication and mortality rates due to COVID-19 in an affluent and high life expectancy region.
16.11.2020	Impact of the COVID-19 Pandemic on Invasive Pneumococcal Disease and Risk of Pneumococcal Coinfection with SARS-CoV-2: prospective national cohort study, England	Clin Infect Dis / Accepted manuscript	<ul style="list-style-type: none"> • Large declines in invasive pneumococcal disease (IPD) observed following COVID-19 lockdown in England. • 1,137 IPD cases Feb-June 2020 were linked with confirmed SARS-CoV-2 infections: 40 IPD/COVID-19 (0.025% [95%CI, 0.018-0.034] of SARS-CoV-2 infections; 3.5% [95%CI, 2.5-4.8] of IPD cases), 21 with COVID-19 diagnosed 3-27 days after IPD and 27 who developed COVID-19 ≥28 days after IPD. • IPD/COVID-19 confections were rare but associated with high CFR, mainly in older adults. • Rarity, age distribution and serotype distribution of IPD/SARS-CoV-2 coinfections does not support wider extension of pneumococcal vaccination.

Epidemiology and clinical – long term complications / sequelae

Publication Date	Title / URL	Journal / Article type	Digest
13.11.2020	Developing services for long Covid: lessons from a study of wounded healers	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Narrative interviews and focus groups are used to explore the experience of 43 healthcare professionals with long Covid. • The authors present a set of co-designed quality standards highlighting equity and ease of access, minimal patient care burden, clinical responsibility, a multidisciplinary and evidence-based approach, and patient involvement, and apply these to propose a potential care pathway model to improve care of long Covid patients.

Infection control / non-pharmaceutical interventions

Publication Date	Title / URL	Journal / Article type	Digest
18.11.2020	Contact tracing: public health management of persons, including healthcare workers, who have had contact with COVID-19 cases in the European Union – third update	European Centre for Disease Prevention and Control / Technical report	<ul style="list-style-type: none"> • This document aims to help public health authorities in EU/EEA countries and the UK in their tracing and management of persons, including healthcare workers, who have had contact with COVID-19 cases.
17.11.2020	Implementation of a Pooled Surveillance Testing Program for Asymptomatic SARS-CoV-2 Infections on a College Campus — Duke University, Durham, North Carolina, August 2–October 11, 2020	MMWR Morb Mortal Wkly Rep / Report	<ul style="list-style-type: none"> • In fall 2020, Duke University’s COVID-19 prevention strategy included risk reduction behaviours, frequent testing using pooled SARS-CoV-2 PCR testing, and contact tracing. Among 10,265 students who received testing 68,913 times, 84 had positive results. One half of infections were asymptomatic, and some had high viral loads. • SARS-CoV-2 transmission was limited in this congregate setting by integration of prevention strategies that included identification of asymptomatic infections through frequent testing. Pooled testing reduced the need for resources while allowing high throughput with high sensitivity and rapid turnaround of results.
16.11.2020	Ranking the effectiveness of worldwide COVID-19 government interventions	Nat Hum Behav / Article	<ul style="list-style-type: none"> • Authors quantify the impact of 6,068 hierarchically coded NPIs implemented in 79 territories on the effective reproduction number, R_t, of COVID-19. • Suitable combination of NPIs needed. Less disruptive and costly NPIs can be as effective as more intrusive, drastic, ones (for example, a national lockdown). • Using country-specific ‘what-if’ scenarios, assess how NPIs effectiveness depends on local context e.g. timing of their adoption, opening the way for forecasting effectiveness of future interventions.
13.11.2020	The Virucidal Efficacy of Oral Rinse Components Against SARS-CoV-2 In Vitro	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • The ability of mouthwashes to inactivate SARS-CoV-2 in vitro was tested under conditions mimicking the naso/oropharynx. • During a 30 second exposure, two mouthwashes containing cetylpyridinium chloride and a third with ethanol/ethyl lauroyl arginate eliminated live virus to EN14476 standards (>4-log₁₀ reduction). • Mouthwashes with ethanol/essential oils and povidone-iodine (PVP-I) eliminated virus by 2-3-log₁₀. • Chlorhexidine or ethanol alone had little or no ability to inactivate virus in this assay. • Studies are warranted to determine whether these formulations can

inactivate virus in the human oropharynx in vivo, and whether this might impact transmission.

Modelling

Publication Date	Title / URL	Journal / Article type	Digest
16.11.2020	Report 35 - COVID-19 How can we keep schools and universities open? Differentiating closures by economic sector to optimize social and economic activity while containing SARS-CoV-2 transmission.	Imperial College / Report	<ul style="list-style-type: none"> • Integrated a dynamic model of SARS-CoV-2 transmission with a 63-sector economic model reflecting sectoral heterogeneity in transmission and economic interdependence between sectors. • Identified control strategies which optimize economic production while keeping schools and universities operational and constraining infections such that emergency hospital capacity is not exceeded. • The model estimates an economic gain of between £163bn and £205bn for the United Kingdom compared to a blanket lockdown of non-essential activity over six months, depending on hospital capacity. Sectors identified as potential priorities for closure are contact-intensive and/or less economically productive.
16.11.2020	Report 36 - Modelling ICU capacity under different epidemiological scenarios of the COVID-19 pandemic in three western European countries	Imperial College / Report	<ul style="list-style-type: none"> • This study used an integrated model of hospital capacity planning and epidemiological projections of COVID-19 patients to estimate the spare capacity of key ICU resources under different epidemic scenarios in France, Germany and Italy across the winter period of 2020/21. In particular, they examine the effect of implementing suppression strategies of varying effectiveness, triggered by different numbers of COVID-19 patients in ICU. • Found that lockdowns of longer duration reduce the total number of days in deficit, but triggering lockdown earlier when COVID-19 ICU occupancy is lower is more effective in minimising deficits. • Results highlight the dependencies between different metrics, suggesting that absolute benefits of different strategies must be weighed against the feasibility and drawbacks of different amounts of time spent in lockdown.

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
16.11.2020	Counting stillbirths and COVID 19—there has never been a more urgent time	Lancet Global Health / Comment
17.11.2020	Expecting the unexpected with COVID-19 vaccines	Lancet Infectious Diseases / Comment

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