Public Health England

COVID-19 Literature Digest – 18/12/2020

This week's guest editor is Dr Louise Smith – senior researcher in the NIHR Health Protection Research Unit in Emergency Preparedness and Response. Louise has been responding to the COVID-19 pandemic since February 2020, principally investigating behaviour.

If you only read three papers this week…

In the first full week of vaccination for COVID-19 in the UK, and following approval of the Pfizer/BioNTech in the USA, Canada, Mexico, Bahrain and Saudi Arabia, the question on everyone's lips is how many people will get vaccinated? Robinson et al have conducted a systematic review and meta-analysis of 28 large (n≥1000) nationally representative samples from 13 countries, investigating reported rates of COVID-19 vaccination intention and factors associated with vaccination intention. In the UK, reported rates of intended uptake ranged between 94% (data collected March 2020) and 54% (data collected September 2020). This pattern of declining vaccination intention over the course of the pandemic was seen across countries. Factors associated with vaccination intention were being older; male; more highly educated; having a higher income; and being white.

Studies reporting rates of adherence to COVID-19 rules and restrictions are often black and white in their categorisation of participants as either adherent or non-adherent, not accounting for differences in risk of transmission. For example, a symptomatic individual walking their dog at midnight would be classed as non-adherent, as would a symptomatic individual getting on public transport to go to work. However, it is likely that the risk of transmission would be much greater in the second situation. Furthermore, people may not follow COVID-19 restrictions out of necessity, for example to buy food or medicine. Denford et al conducted qualitative interviews with 20 participants from BAME and low-income white backgrounds (groups who have been disproportionately affected by COVID-19 restrictions) to investigate patterns of adherence to restrictions and reasons underpinning behaviour. They identified three patterns of behaviour: 1) caution motivated super-adherence 2) risk-adapted partial-adherence and 3) necessity-driven partial-adherence.

And finally, mass testing programmes, like the one trialled in Liverpool, are set to be rolled out to English Tier 3 regions starting this week. But do they work? Research suggests that the introduction of a mass testing programme in Slovenia helped reduce COVID-19 infections. Counties that were subject to two rounds of mass testing, one week apart, saw prevalence of COVID-19 decrease by 61% in the second round of testing (adjusted for geographical clustering, attendance rates, and epidemiological situation in the first round of testing). However, experts were not sure how much of the drop was due to the testing programme and how much was due to the introduction of other restrictions brought in at the same time (e.g. closing schools for certain age groups and restricting indoor hospitality and leisure activities). The testing programme in Slovenia has some notable differences to the UK system, with people who did not get tested being told to stay at home for 10 days, or until the next round of testing. Employees were required to provide a certificate of negative test result in order to enter their workplace.

Louise

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 18.12.2020 (please note that papers that have **NOT been peer-reviewed** are highlighted in red).

Sections:

Diagnostics and genomics

Publication Date	Title / URL	Journal / Article type	Digest
17.12.2020	Estimating the false-negative test probability of SARS-CoV-2 by RT-PCR	Eurosurveillance / Research	• Aimed to determine how the probability of obtaining a false-negative test in infected patients is affected by time since symptom onset and swab type. • Concluded that NP samples are more sensitive than OP samples. The later an infected individual is tested after symptom onset, the less likely they are to test positive. This has implications for identifying infected patients, contact tracing and discharging convalescing patients who are potentially still infectious.
15.12.2020	Diagnostic accuracy of Loop mediated isothermal amplification coupled to Nanopore sequencing for the detection of SARS-CoV-2 infection at scale in symptomatic and asymptomatic populations	medRxiv (non-peer reviewed) / Article	• Investigates the use of LamPORE, where loop mediated isothermal amplification (LAMP) is coupled to nanopore sequencing technology, for the detection of SARS-CoV-2 in symptomatic (n=848) and asymptomatic (n=1200) populations. • The incidence of SARS-CoV-2 detection using LamPORE was 0.95%. • Diagnostic sensitivity and specificity of LamPORE was >99.5% in both swab and saliva asymptomatic samples when compared to the reference RT-qPCR test. • In the retrospective symptomatic cohort, the incidence was 13.4% and the sensitivity and specificity were 100%.
17.12.2020	Evaluation of lockdown effect on SARS-CoV-2 dynamics through viral genome quantification in waste water, Greater Paris, France, 5 March to 23 April 2020	Eurosurveillance / Research	• Aimed to test if the quantification of SARS-CoV-2 genomes in waste water (WW) correlates with the number of symptomatic or non-symptomatic carriers (Paris, France). • Showed that the increase of genome units in raw WW accurately followed the increase of human COVID-19 cases observed at the regional level. • Of note, the viral genome could be detected before the epidemic grew massively (around 8 Mar). Equally importantly, a marked decrease in the quantities of genome units was observed concomitantly with the reduction in the number of new COVID-19 cases, 29 days following the lockdown. • This work suggests that a quantitative monitoring of SARS-CoV-2 genomes in WW could generate important additional information for improved monitoring of SARS-CoV-2 circulation at local or regional levels and emphasises the role of WW-based epidemiology.

Epidemiology and clinical – risk factors

Publication Date	Title / URL	Journal / Article type	Digest
17.12.2020	Occupation- and age-associated risk of SARS-CoV-2 test positivity, the Netherlands, June to October 2020	Eurosurveillance / Rapid communication	• High coronavirus incidence has prompted the Netherlands to implement a second lockdown. To elucidate the epidemic's development preceding this second wave, the authors analysed weekly test positivity in public test locations by population subgroup between 1 June and 17 Oct 2020. • Hospitality and public transport workers, driving instructors, hairdressers and aestheticians had higher test positivity compared with a reference group of individuals without a close-contact occupation. Workers in childcare, education and healthcare showed lower test positivity.
17.12.2020	The first wave of the COVID-19 pandemic in Spain: characterisation of cases and risk factors for severe outcomes, as at 27 April 2020	Eurosurveillance / Surveillance	• The authors describe reported cases and the impact of national lockdown in Spain, and identified disease severity risk factors. • COVID-19 case numbers began declining 6 days after the national lockdown. The first wave of the COVID-19 pandemic in Spain had a severe impact on elderly people. Patients with cardiovascular or renal conditions were at higher risk for severe outcomes. A high proportion of cases were HCWs.
16.12.2020	The association between blood pressure control and Coronavirus Disease 2019 outcomes in 45,418 symptomatic patients with hypertension: An observational cohort study	Hypertension / Article	• Study examined association between pre-infection blood pressure (BP) control and COVID-19 outcomes using data from 460 general practices in England. • Of 45,418 patients (mean age 67 years; 44.7% male) included, 11,950 (26.3%) had controlled BP. • In total, 4,277 patients (9.4%) were diagnosed with COVID-19 and 877 died within 28 days. • Individuals with stage 1 uncontrolled BP had lower odds of COVID-19 death (OR 0.76) compared to patients with well-controlled BP. • There was no association between BP control and COVID-19 diagnosis or hospitalisation. • Findings suggest BP control may be associated with worse COVID-19 outcomes, possibly due to these patients having more advanced atherosclerosis and target organ damage.
18.12.2020	Factors That Might Affect SARS-CoV-2 Transmission Among Foreign-Born and U.S.-Born Poultry Facility Workers - Maryland, May 2020	MMWR / Article	• Workers at meat and poultry processing facilities at increased risk for SARS-CoV-2 / disproportionately foreign-born. Findings from study of 2 Maryland poultry facilities. • Foreign-born workers had higher odds of working on production floor, living with other poultry workers. Lower odds of participating in social gatherings, visiting businesses during preceding week.

			• Engineering and administrative controls might reduce SARS-CoV-2 transmission risk for workers on the production floor, many of whom are foreign-born. • Culturally and linguistically tailored messages should be disseminated about mitigation measures, particularly those pertaining to carpools and close living quarters.
17.12.2020	Incidence of SARS-CoV-2 Infection Among Patients Undergoing Active Antitumor Treatment in Italy	JAMA Oncol / Research Letter	• A retrospective study of 59,989 Italian patients receiving anti-tumour treatment at 118 Medical Oncology Units between 15 Jan and 4 May 2020 provides what is thought to be the first estimate of the SARS-CoV-2 infection rate in such patients. • In total, 406 developed COVID-19 (0.68%). The median age of infected patients was 68 (28-89) years, most were symptomatic (n = 339; 83%), and 314 (77%) required hospitalisation. • Lung cancer was the most common tumour (n = 91; 22%), and chemotherapy the most represented antitumor treatment (n = 252; 62%). • Overall, the low probability of SARS-CoV-2 infection among these patients (<1%) supports continuation of most oncologic treatments in the adjuvant and metastatic setting.

Epidemiology and clinical – other

Publication Date	Title / URL	Journal / Article type	Digest
17.12.2020	Comparison of the characteristics, morbidity, and mortality of COVID-19 and seasonal influenza: a nationwide, population-based retrospective cohort study	Lancet Respiratory Medicine / Article	• Comparisons of risk factors, clinical characteristics, and outcomes between patients hospitalised for COVID-19 and influenza were performed, with data also stratified by age group. • 89 530 patients with COVID-19 (Mar 1 to Apr 30, 2020) and 45 819 patients with influenza (Dec 1, 2018, and Feb 28, 2019) were hospitalised in France during the respective study periods. • The presentation of patients with COVID-19 and seasonal influenza requiring hospitalisation differs considerably. SARS CoV-2 is likely to have a higher potential for respiratory pathogenicity, leading to more respiratory complications and to higher mortality. In children, although the rate of hospitalisation for COVID-19 appears to be lower than for influenza, in-hospital mortality is higher; however, low patient numbers limit this finding.
15.12.2020	Comparative evaluation of clinical manifestations and risk of death in patients admitted to hospital with covid-19 and seasonal influenza: cohort study	BMJ / Research	• Cohort study compared patients admitted to hospital with COVID-19 between 1 Feb and 17 June 2020 (n=3,641), and seasonal influenza between 2017 and 2019 (n=12,676).

			• Differences in rates of death per 100 patients were most pronounced in people >75 years of age with chronic kidney disease or dementia, and those with black race and obesity, diabetes, or chronic kidney disease.
15.12.2020	REACT-1 round 7 updated report: regional heterogeneity in changes in prevalence of SARS-CoV-2 infection during the second national COVID-19 lockdown in England	medRxiv (non-peer reviewed) / Article	• Reports data for the entire round 7 of REACT-1 with swab results obtained from 13 Nov to 3 Dec 2020. • There were 1,299 positive swabs out of 168,181 giving a weighted prevalence of 0.94%, or 94 per 10,000 people infected in the community in England. • This compares with a prevalence of 1.30% from 16 Oct to 2 Nov 2020 (round 6), a decline of 28%. • The national R number in round 7 was estimated at 0.96. • Nationally, between 13th Nov and 3rd Dec, the highest prevalence was in school-aged children especially at ages 13-17 years at 2.04% (1.69%, 2.46%), or approximately 1 in 50.

Infection control / non-pharmaceutical interventions

Publication Date	Title / URL	Journal / Article type	Digest
17.12.2020	Measures implemented in the school setting to contain the COVID-19 pandemic: a scoping review	Cochrane Database Syst Rev / Scoping review	• A rapid scoping review of COVID-19 control measures implemented in the school setting identified a heterogeneous and complex evidence base. • Of 42 included studies, most used mathematical modelling designs (n = 31), while nine studies used observational designs, and two studies used experimental or quasi-experimental designs. • Three broad intervention categories emerged: organisational measures to reduce transmission (n = 36), structural/environmental measures to reduce transmission (n = 11), and surveillance and response measures to detect infections (n = 19). • Most studies assessed transmission-related outcomes (n = 29), while others assessed healthcare utilisation (n = 8), other health outcomes (n = 3), and societal, economic, and ecological outcomes (n = 5). • Studies assessed both harmful and beneficial outcomes across all categories.
15.12.2020	Inferring the effectiveness of government interventions against COVID-19	Science / Article	• Authors gathered chronological data on the implementation of nonpharmaceutical interventions (NPIs) for several European, and other, countries between Jan and the end of May 2020. • Effectiveness of NPIs estimated using a Bayesian hierarchical model that links NPI implementation dates to national case and death counts.

			• Closing all educational institutions, limiting gatherings to 10 people or less, and closing face-to-face businesses each reduced transmission considerably. Additional effect of stay-at-home orders was comparatively small.
17.12.2020	Early assessment of the impact of mitigation measures to control COVID-19 in 22 French metropolitan areas, October to November 2020	Eurosurveillance / Rapid communication	• In France, measures including curfew and lockdown were implemented to control the COVID-19 pandemic second wave in 2020. • This study descriptively assesses their possible effects, also relative to their timing. • A considerable decrease in incidence of COVID-19 cases and hospital admissions was observed 7 to 10 days after mitigation measures were put in place, occurring earlier in metropolitan areas which had implemented these first. • This temporal coincidence suggests the measures' positive impact, consistent with international experiences.

Transmission

Publication Date	Title / URL	Journal / Article type	Digest
16.12.2020	SARS-CoV-2 Infections among Recent Organ Recipients, March-May 2020, United States	Emerg Infect Dis / Dispatch	• A public health investigation into eight organ transplant recipients who tested positive for COVID-19 infection suggests the most likely source of transmission was community or healthcare exposure, not the organ donor. • Authors recommend transplant centres educate transplant candidates and recipients about infection prevention.

Treatment

Publication Date	Title / URL	Journal / Article type	Digest
17.12.2020	REGN-COV2, a Neutralizing Antibody Cocktail, in Outpatients with Covid-19	N Engl J Med / Article	• Authors investigated two fully human, neutralizing monoclonal antibodies against SARS-CoV-2 spike protein, in a combined cocktail (REGN-COV2) to reduce risk of treatment-resistant mutant virus. • 275 non-hospitalized patients randomly assigned (1:1:1) to receive placebo, 2.4 g REGN-COV2, or 8.0 g REGN-COV2. Characterized at baseline for endogenous immune response against SARS-CoV-2 (serum antibody–positive or serum antibody–negative). • Interim analysis: REGN-COV2 antibody cocktail reduced viral load, with greater effect in patients whose immune response had not yet been

			initiated or who had a high viral load at baseline. • Safety outcomes were similar in the combined REGN-COV2 dose groups and the placebo group.

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
18.12.2020	Long COVID guidelines need to reflect lived experience	Lancet / Comment
17.12.2020	Persistence of IgG response to SARS-CoV-2	Lancet Infectious Diseases / Comment
16.12.2020	Inclusion of pregnant women in COVID-19 treatment trials: a review and global call to action	Lancet Global Health / Health policy
15.12.2020	Equitable global access to coronavirus disease 2019 vaccines	BMJ / Editorial
15.12.2020	Reserving coronavirus disease 2019 vaccines for global access: cross sectional analysis	BMJ / Research
15.12.2020	Global, regional, and national estimates of target population sizes for covid-19 vaccination: descriptive study	BMJ / Research
17.12.2020	Renin–angiotensin system inhibitors and COVID-19: overwhelming evidence against an association	Lancet Digital Health / Comment

Produced by the PHE COVID-19 Literature Digest Team

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