



COVID-19 Literature Digest – 05/10/2020

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, 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a report three times per week (Mon, Wed, Fri), which includes both preliminary reports of work (preprints) that have NOT been peer-reviewed and research that has been subject to peer review and wider scrutiny.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 wncov.behaviour@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Report for 05.10.2020 (please note that papers that have **NOT been peer-reviewed** are **highlighted in red**).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
02.10.2020	Seroprevalence of SARS-COV-2 Antibodies in Scottish Healthcare Workers	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none">• A study of seroprevalence in a cohort of health and social care workers (n=2062; female 81.7%) in NHS Tayside from May to Sept 2020.• Healthcare workers had an increased likelihood of a positive COVID-19 antibody test (odds ratio 3.4 95% CI 1.85-6.16, p<0.0001), with 299 healthcare workers having a positive result (14.5%), compared to 11 out of 231 controls (4.8%).• Dentists, healthcare assistants and porters were the roles most likely to test positive.• Those working in front-line roles with COVID-19 patients were more likely to test positive (17.4% vs. 13.4%, p=0.02).• Anosmia was the symptom most associated with the presence of detectable antibodies.

Diagnostics

Publication Date	Title / URL	Journal / Article type	Digest
28.09.2020	SARS-CoV-2 viral load peaks prior to symptom onset: a systematic review and individual-pooled analysis of coronavirus viral load from 66 studies	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none">• A systematic review and individual-pooled analysis of COVID-19 viral load studies identified 115 relevant papers and obtained data from 66 (57.4%), representing 1198 patients across 14 countries.• COVID-19 viral load peaks prior to symptom onset and remains elevated for up to three weeks, while MERS-CoV and SARS-CoV viral loads peak after symptom onset.• COVID-19, MERS-CoV, and SARS-CoV had median viral shedding durations of 4.8, 4.2, and 1.2 days after symptom onset.• Disease severity, age, and specimen type all have an effect on viral load, but sex does not.

Genomics

Publication Date	Title / URL	Journal / Article type	Digest
29.09.2020	SARS-CoV-2 variant tracing within the first COVID-19 clusters in Northern Germany	Clin Microbiol Infect / Article	<ul style="list-style-type: none"> • Amplikon sequencing and cluster analyses of SARS-CoV-2 sequences allowed the identification of the first infection cluster and five non-related infection clusters occurring at the beginning of the viral entry of SARS-CoV-2 in the Hamburg metropolitan region. • Viral genomics together with epidemiological analyses revealed that the index patient acquired the infection in Northern Italy and transmitted it to two out of 134 contacts. • SNPs clearly distinguished the virus variants of the index and other clusters and allowed to track in which sequences worldwide these mutations were first described. Minor variant analyses identified the transmission of intra-host variants in the index cluster and household clusters.
01.10.2020	Genetic and non-genetic factors affecting the expression of COVID-19 relevant genes in the large airway epithelium	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • The authors analysed RNA-sequencing data from bronchial epithelial brushings obtained from three cohorts of COVID-19 negative individuals to investigate how non-genetic and genetic factors affect the regulation of host genes. • ACE2 expression was higher in relation to active smoking, obesity, and hypertension, while an association with interferon-related inflammation was driven by the truncated, non-binding ACE2 isoform. • Compared to other viruses, expression patterns of a suppressed airway immune response to early COVID-19 infection are similar to patterns associated with obesity, hypertension, and cardiovascular disease. • eQTL mapping identified regulatory variants for genes implicated in COVID-19, some of which had pheWAS evidence for their potential role in respiratory infections.

Epidemiology and clinical – risk factors

Publication Date	Title / URL	Journal / Article type	Digest
02.10.2020	Risk factors associated with SARS-CoV-2 infection and outbreaks in Long Term Care Facilities in England: a national survey	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • A cross-sectional survey of all Long Term Care Facilities (LTCFs) in England aimed to identify risk factors. • A total of 5126/9081 (56%) of LTCFs participated (160,033 residents; 248,594 staff). • Weighted period prevalence of infection in residents and staff was 10.5% (95% CI: 9.9-11.1%) and 3.8% (95%: 3.4-4.2%), and 2724 LTCFs (53.1%) had at

			<p>least one case of infection.</p> <ul style="list-style-type: none"> • Odds of infection and/or outbreaks were reduced in LTCFs that paid sickness pay, cohorted staff, did not employ agency staff and had higher staff to resident ratios. • Higher odds of infection and outbreaks were identified in facilities with more admissions, lower cleaning frequency, poor compliance with isolation and for profit status.
28.09.2020	Place and causes of acute cardiovascular mortality during the COVID-19 pandemic	Heart / Article	<ul style="list-style-type: none"> • <i>This paper was previously included in the Digest as a preprint.</i> • Describes the place and causes of acute cardiovascular death during the COVID-19 pandemic. • Retrospective cohort of adult (age ≥18 years) acute cardiovascular deaths (n=5 87 225) in England and Wales, from 1 Jan 2014 to 30 June 2020. The exposure was the COVID-19 pandemic (from onset of the first COVID-19 death in England, 2 March 2020). The main outcome was acute cardiovascular events directly contributing to death. • The COVID-19 pandemic has resulted in an inflation in acute cardiovascular deaths, nearly half of which occurred in the community and most did not relate to COVID-19 infection suggesting there were delays to seeking help or likely the result of undiagnosed COVID-19.
01.10.2020	First results of the "Lean European Open Survey on SARS-CoV-2-Infected Patients (LEOSS)"	Infection / Article	<ul style="list-style-type: none"> • LEOSS cohort (2155 patients) identified age, cardiovascular disease, diabetes and male sex as risk factors for complicated COVID-19 at diagnosis, confirming previous data. • Further data regarding outcomes of the natural course of COVID-19 and the influence of treatment are required.
02.10.2020	Rates and Characteristics of SARS-CoV-2 Infection in Persons with Hepatitis C Virus Infection	Liver Int / Article	<ul style="list-style-type: none"> • Investigated the impact of liver fibrosis stage upon COVID-19 infection rates in 172,235 persons with hepatitis C virus (HCV) infection: 14,305 (8.3%) tested; 892 (6.2%) positive. • Testing rates among persons with HCV are very low. Persons with infection are more likely to be Black, have a higher body mass index and diabetes or stroke. • Degree of liver fibrosis does not appear to have an impact on infection rate.
01.10.2020	Cardiovascular risk factors are independently associated with COVID-19 mortality: a prospective cohort study	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • The authors analyse data from the Dutch COVID-PREDICT prospective cohort (1604 patients; 60.5% male; Mean age 66) to investigate the time-to-event relationship between hypertension, dyslipidemia, diabetes, and COVID-19 outcomes. • Antihypertensives, lipid lowering therapy, and antidiabetics were used by 45%, 34.7%, and 22.1% of patients. • After adjustment for age and sex, the presence of ≥2 risk factors was

			<p>associated with increased mortality risk (HR 1.52, 95%CI 1.15-2.02), but not with ICU-admission.</p> <ul style="list-style-type: none"> • Use of ≥ 2 antidiabetics and ≥ 2 antihypertensives was associated with mortality independent of age and sex with HRs of respectively 2.09 (95%CI 1.55-2.80) and 1.46 (95%CI 1.11-1.91).
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Epidemiology and clinical – long term complications / sequelae

Publication Date	Title / URL	Journal / Article type	Digest
05.10.2020	Long Covid: Reviewing the Science and Assessing the Risk	Institute for Global Change / Article	<ul style="list-style-type: none"> • In this paper, the authors combine data from the Covid Symptom Study with emerging evidence from the broader scientific community to understand what we do and don't know about those suffering with long-term symptoms of Covid-19.

Epidemiology and clinical – other

Publication Date	Title / URL	Journal / Article type	Digest
02.10.2020	Recent Increase in COVID-19 Cases Reported Among Adults Aged 18-22 Years - United States, May 31-September 5, 2020	MMWR Morb Mortal Wkly Rep / Report	<ul style="list-style-type: none"> • Aug 2nd –Sept 5th, weekly COVID-19 cases among 18–22 year olds increased 55% nationally. Increases not solely attributable to increased testing. • Weekly incidence among White persons aged 18-22 years increased 149.7% (95% CI = 78.8%–248.7%), from 48 per 100,000 to 120; incidence among persons of other racial and ethnic minority groups remained stable or declined. • Approximately 45% attend colleges and universities; 55% of those attending identified as White persons: resumption of in-person attendance at some colleges and universities one factor.
02.10.2020	Case Series of Multisystem Inflammatory Syndrome in Adults Associated with SARS-CoV-2 Infection — United Kingdom and United States, March–August 2020	MMWR Morb Mortal Wkly Rep / Report	<ul style="list-style-type: none"> • Multisystem inflammatory syndrome in children (MIS-C) is a rare but severe complication of SARS-CoV-2 infection in children and adolescents. Since June 2020, several case reports and series have been published reporting a similar multisystem inflammatory syndrome in adults (MIS-A). • Cases reported to CDC and published case reports and series identify MIS-A in adults, who usually require intensive care and can have fatal outcomes. Antibody testing was required to identify SARS-CoV-2 infection in approximately one third of 27 cases.

			<ul style="list-style-type: none"> • Clinical suspicion and indicated SARS-CoV-2 testing, including antibody testing, might be needed to recognize and treat adults with MIS-A.
01.10.2020	SARS-CoV-2 infection in London, England: changes to community point prevalence around lockdown time, March-May 2020	J Epidemiol Community Health / Short report	<ul style="list-style-type: none"> • <i>This paper was previously included in the Digest as a preprint.</i> • Assessed COVID-19 point prevalence in London between early April and early May 2020, which approximately reflect infection around the time of the lockdown and 3–5 weeks into lockdown. • Tested 1064 participants of a community surveillance cohort for acute COVID-19 infection using PCR in London in April and May 2020 and described positivity as well as characteristics and symptoms of the participants. • Concluded that COVID-19 point prevalence in the community sharply decreased after lockdown was implemented. This study is based on a small sample and regular seroprevalence studies are needed to better characterise population-level immunity.

Infection control

Publication Date	Title / URL	Journal / Article type	Digest
02.10.2020	SPI-B/EMG: COVID-19 housing impacts, 10 September 2020	Gov.uk / Research and analysis	<ul style="list-style-type: none"> • Integrated and analysed existing data plus primary mixed methods research to understand patterns of infection transmission in the home and acceptable, feasible and effective methods of mitigation.
02.10.2020	NERVTAG/EMG: Duration of wearing of face coverings, 15 September 2020	Gov.uk / Research and analysis	<ul style="list-style-type: none"> • This paper focuses specifically on the evidence relating to the duration with which face coverings can be safely worn. • The paper only considers face coverings for public/general workplace settings and does not cover respiratory protective equipment (RPE) designed to protect the wearer from aerosols.
03.10.2020	Survival of SARS-CoV-2 and influenza virus on the human skin: Importance of hand hygiene in COVID-19	Clin Infect Dis / Article	<ul style="list-style-type: none"> • Authors evaluated stability of SARS-CoV-2 and influenza A virus (IAV), mixed with culture medium or upper respiratory mucus, on human skin surfaces and dermal disinfection effectiveness of 80% (w/w) ethanol. • Both SARS-CoV-2 and IAV in mucus/medium on human skin were completely inactivated within 15 seconds by ethanol treatment. • 9-hour survival of SARS-CoV-2 on human skin may increase the risk of contact transmission in comparison with IAV, thus accelerating the pandemic.
30.09.2020	Exhaled aerosol increases with COVID-19 infection, and risk factors of disease symptom severity	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • The authors conducted an observational cohort study to analyse the exhaled breath particles of 74 healthy human subjects, and an experimental infection study of eight non-human primates infected by aerosol with SARS-CoV-2.

		<ul style="list-style-type: none"> • Exhaled aerosol particles increase one to three orders of magnitude with aging, high BMI, and COVID-19 infection. • Variances appear to be related to changes in airway mucus surface composition and the propensity for mucus surfaces to breakup into small droplets during acts of breathing. • In the human study 20% of participants accounted for 80% of the overall exhaled bioaerosol, reflecting a bioaerosol distribution analogous to a classical 20:80 super spreader distribution.
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Treatment

Publication Date	Title / URL	Journal / Article type	Digest
02.10.2020	SARS-CoV2-mediated suppression of NRF2-signaling reveals potent antiviral and anti-inflammatory activity of 4-octyl-itaconate and dimethyl fumarate	Nat Commun / Article	<ul style="list-style-type: none"> • Demonstrate that the NRF2 antioxidant gene expression pathway is suppressed in biopsies obtained from COVID-19 patients. • NRF2 agonists 4-OI and DMF induce a distinct IFN-independent antiviral program that is broadly effective in limiting virus replication and in suppressing the pro-inflammatory responses of human pathogenic viruses, including SARS-CoV-2.

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
01.10.2020	SARS-CoV-2 Vaccine Development & Implementation; Scenarios, Options, Key Decisions	Royal Society DELVE Initiative / Report
01.10.2020	New tool for the early detection of public health threats from Twitter data: epitweetr	European Centre for Disease Control and Prevention / News

Produced by the PHE COVID-19 Literature Digest Team

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