



COVID-19 Literature Digest – 20/01/2021

Dear all,

Since February 2020 we have produced this COVID-19 specific Literature Digest to ensure PHE response staff are aware of the latest scientific evidence on COVID-19. Early on it was decided to share this resource widely to assist other colleagues work on this unprecedented pandemic. The uptake has been considerable, from a distribution of ten people to >710, with more people signing-up each day.

As you will recognise, production of the Digest in its current form takes significant resource; it is likely that this product will be modified in the future to make its delivery more sustainable.

We are therefore seeking your feedback to gain an understanding of what the most valuable/least valuable aspects of this Digest are.

To this end, we ask you kindly to give five minutes of your time to complete the survey below. The survey will close Friday 22nd January 2021. (Please be patient as the survey may take a minute to load initially)

[Our survey can be accessed here.](#)

Please find [today's report](#) below.

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 The reports include both preprints, which should be treated with caution as they are NOT peer-reviewed and may be subject to change, and also research that has been subject to peer review and wider scrutiny.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Report for 20.01.2021 (please note that papers that have **NOT been peer-reviewed** are highlighted in red).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
18.01.2021	Evolution of antibody immunity to SARS-CoV-2	Nature / Article	<ul style="list-style-type: none">• Authors report on the humoral memory response in a cohort of 87 individuals assessed at 1.3 and 6.2 months after infection.• Memory B cells display clonal turnover after 6.2 months; the antibodies they express have greater somatic hypermutation, increased potency and resistance to RBD mutations, indicative of continued evolution of the humoral response.• Conclude that the memory B cell response to SARS-CoV-2 evolves between 1.3 and 6.2 months after infection in a manner that is consistent with antigen persistence.
15.01.2021	The impact of Spike mutations on SARS-CoV-2 neutralization	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none">• Analyses of a panel of Spike-specific monoclonal antibodies revealed that the neutralising activity of some antibodies was dramatically reduced by Spike mutations.• In contrast, polyclonal antibodies in the serum of patients infected in early 2020 remained active against most mutated Spike pseudotypes.• The majority of serum samples were equally able to neutralize the B.1.1.7 Spike pseudotype, however potency was reduced in a small number of samples (3 of 36) by 5–10-fold.

19.01.2021	Neutralization of SARS-CoV-2 lineage B.1.1.7 pseudovirus by BNT162b2 vaccine-elicited human sera	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Study investigated SARS-CoV-2-S pseudoviruses bearing either the Wuhan reference strain or the B.1.1.7 lineage spike protein with sera of 16 participants in a previously reported trial with the mRNA-based COVID-19 vaccine BNT162b2. • The immune sera had equivalent neutralising titres to both variants. • These data, together with the combined immunity involving humoral and cellular effectors induced by this vaccine, make it unlikely that the B.1.1.7 lineage will escape BNT162b2-mediated protection.
19.01.2021	SARS-CoV-2 501Y.V2 escapes neutralization by South African COVID-19 donor plasma	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Study found that the 501Y.V2 lineage exhibits complete escape from three classes of therapeutically relevant monoclonal antibodies. • Furthermore, 501Y.V2 showed substantial or complete escape from neutralising antibodies in COVID-19 convalescent plasma.

Diagnostics and genomics

Publication Date	Title / URL	Journal / Article type	Digest
19.01.2021	Evaluation of Abbott BinaxNOW Rapid Antigen Test for SARS-CoV-2 Infection at Two Community-Based Testing Sites — Pima County, Arizona, November 3–17, 2020	MMWR / Report	<ul style="list-style-type: none"> • The BinaxNOW rapid antigen test received Emergency Use Authorization by the Food and Drug Administration for testing specimens from symptomatic persons; performance among asymptomatic persons is not well characterized. • Sensitivity of the BinaxNOW antigen test, compared with PCR testing, was lower when used to test specimens from asymptomatic (35.8%) than from symptomatic (64.2%) persons, but specificity was high. • Sensitivity was higher for culture-positive specimens (92.6% and 78.6% for those from symptomatic and asymptomatic persons, respectively); however, some antigen test-negative specimens had culturable virus.
19.01.2021	Insight into the practical performance of RT-PCR testing for SARS-CoV-2 using serological data: a cohort study	Lancet Microbe / Article	<ul style="list-style-type: none"> • Aimed to assess the practical performance of RT-PCR-based surveillance protocols and determine the extent of undetected SARS-CoV-2 infection in Shenzhen, China. • Concluded that even rigorous RT-PCR testing protocols might miss a substantial proportion of SARS-CoV-2 infections, perhaps in part due to difficulties in determining the timing of testing in asymptomatic individuals for optimal sensitivity. • RT-PCR-based surveillance and control protocols that include rapid contact tracing, universal RT-PCR testing, and mandatory 2-week quarantine were, nevertheless, able to contain community spread in Shenzhen, China.

17.01.2021	SARS-CoV-2 viral load distribution in different patient populations and age groups reveals that viral loads increase with age	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Observed that in a cohort of patients (n=25,365) tested positive by Dutch public health services, SARS-CoV2 viral load increased significantly with age. • Children aged<12 years showed lower viral loads than shown in adults (p<0.001), independent of sex and/or symptom duration. • Median Cp values between the oldest (>79 years) and youngest (<12 years) population differed by over 4 PCR cycles, suggesting approximately a 16 fold difference in viral load.
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Epidemiology and clinical – risk factors

Publication Date	Title / URL	Journal / Article type	Digest
19.01.2021	Association of Intensive Care Unit Patient Load and Demand With Mortality Rates in US Department of Veterans Affairs Hospitals During the COVID-19 Pandemic	JAMA Netw Open / Original investigation	<ul style="list-style-type: none"> • In this cohort study of 8516 patients with COVID-19 admitted to 88 US Veterans Affairs hospitals, strains on critical care capacity were associated with increased COVID-19 mortality. • Adjusted hazard ratio for all-cause mortality: 0.99 (95% CI, 0.81-1.22; P = .93) when COVID-19 ICU demand 25% to 50%; 1.19 (95% CI, 0.95-1.48; P = .13) when more than 50% to 75%; 1.94 (95% CI, 1.46-2.59; P < .001) when more than 75% to 100%. • Among COVID-19 patients, those treated in ICU during periods of peak COVID-19 ICU demand had a nearly 2-fold increased risk of mortality compared with those treated during low demand.

Epidemiology and clinical – long-term complications / sequelae

Publication Date	Title / URL	Journal / Article type	Digest
15.01.2021	Epidemiology of post-COVID syndrome following hospitalisation with coronavirus: a retrospective cohort study	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • An observational, matched UK cohort study examined 47,780 COVID-19 patients (mean age 65 years, 55% male) following their discharge from hospital. • Mean follow-up time was 140 days for COVID-19 cases and 153 days for controls. • In total 766 re-admissions and 320 deaths per 1,000 person-years were observed in COVID-19 cases, 3.5 and 7.7 times greater, respectively, than in controls. • Individuals discharged from hospital following COVID-19 face elevated rates of multi-organ dysfunction compared with background levels, and the increase in risk is neither confined to the elderly nor uniform across ethnicities.

Epidemiology and clinical – other

Publication Date	Title / URL	Journal / Article type	Digest
15.01.2021	Viral Genetic Evidence and Host Immune Response of a Small Cluster of Individuals with Two Episodes of SARS-CoV-2 Infection	SSRN (non-peer reviewed) / Article	<ul style="list-style-type: none"> • SARS-CoV-2 reinfection was documented by identification of genetically distinct virus sequences in the first and second episodes for four individuals from Rio de Janeiro, Brazil. • The identification that some individuals with mild COVID-19 may have controlled SARS-CoV-2 replication without developing detectable humoral immunity, opens the possibility that reinfection may be more frequent than supposed – but weakly documented.
14.01.2021	Natural SARS-CoV-2 infection in kept ferrets, Spain	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Study found SARS-CoV-2 RNA in 6 of 71 ferrets (8.4%) and isolated the virus from one rectal swab. • Suggests natural SARS-CoV-2 infection does occur in kept ferrets, at least under circumstances of high viral circulation in the human population. However, small ferret collections are probably unable to maintain prolonged virus circulation.

Infection control / non-pharmaceutical interventions

Publication Date	Title / URL	Journal / Article type	Digest
19.01.2021	Mask-wearing and control of SARS-CoV-2 transmission in the USA: a cross-sectional study	Lancet Digital Health / Article	<ul style="list-style-type: none"> • Investigated the association between self-reported mask-wearing, physical distancing, and SARS-CoV-2 transmission in the USA, along with the effect of statewide mandates on mask uptake. • 378 207 individuals responded to the survey between June 3 and July 27, 2020, of which 4186 were excluded for missing data. • Concluded that the widespread reported use of face masks combined with physical distancing increases the odds of SARS-CoV-2 transmission control. Self-reported mask-wearing increased separately from government mask mandates, suggesting that supplemental public health interventions are needed to maximise adoption and help to curb the ongoing epidemic.
16.01.2021	COVID-19 within a large prison with high number of vulnerable adults in the UK, March to June 2020: an outbreak investigation and screening event	Int J Infect Dis / Article	<ul style="list-style-type: none"> • Describes the public health response to COVID-19 within a large prison with a high number of clinically vulnerable residents. • Control measures were quickly implemented after the first COVID-19 case was reported, leading to a steady decrease in cases and prevention of wider spread within the prison.

Transmission

Publication Date	Title / URL	Journal / Article type	Digest
18.01.2021	Household transmission of SARS-CoV-2 and risk factors for susceptibility and infectivity in Wuhan: a retrospective observational study	Lancet Infectious Diseases / Article	<ul style="list-style-type: none">• Aimed to assess household transmissibility of SARS-CoV-2 and risk factors associated with infectivity and susceptibility to infection in Wuhan.• 27 101 households with 29 578 primary cases and 57 581 household contacts were identified.• Within households, children and adolescents were less susceptible to SARS-CoV-2 infection but were more infectious than older individuals. Presymptomatic cases were more infectious and individuals with asymptomatic infection less infectious than symptomatic cases.

Treatment

Publication Date	Title / URL	Journal / Article type	Digest
19.01.2021	The effect of early treatment with ivermectin on viral load, symptoms and humoral response in patients with non-severe COVID-19: A pilot, double-blind, placebo-controlled, randomized clinical trial	EclinicalMedicine / Research paper	<ul style="list-style-type: none">• Ivermectin inhibits replication of SARS-CoV-2 in vitro at concentrations not readily achievable with currently approved doses.• Pilot, randomized, double-blind, placebo-controlled trial [12=ivermectin / 12=placebo] to evaluate the efficacy of a single dose of ivermectin reduce the transmission of SARS-CoV-2 when administered early after disease onset.• Pilot failed to show a reduction in proportion of PCR-positive patients seven days after ivermectin treatment; yet it shows a reduction in the self-reported anosmia/hyposmia and a (non-statistically significant) tendency to lower viral loads and lower IgG titers which presumably reflect milder disease.

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
18.01.2021	Covid-19: What new variants are emerging and how are they being investigated?	Bmj / News
19.01.2021	SARS-CoV-2 Vaccines: Much Accomplished, Much to Learn	Ann Intern Med / Special article

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