



COVID-19 Literature Digest – 13/09/2021

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 The reports include both preprints, which should be treated with caution as they are NOT peer-reviewed and may be subject to change, and also research that has been subject to peer review and wider scrutiny.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

Emma Farrow, James Robinson, Kester Savage
On behalf of the PHE COVID-19 Literature Digest Team

Report for 10.09.2021 (please note that papers that have **NOT been peer-reviewed** are highlighted in red).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
06.09.2021	SARS-CoV-2 B.1.617.2 Delta variant replication and immune evasion	Nature / Article	<ul style="list-style-type: none">• Authors present a combination of in vitro experimentation and molecular epidemiology to demonstrate evasion of neutralising antibodies by a B.1.617.2 live virus with sera from convalescent patients, as well as sera from individuals vaccinated with two different vaccines, ChAdOx-1 [AstraZeneca] and BNT162b2 [Pfizer].• Reduced efficacy for imedevimab against B.1.617.2 is also discussed as well physiological features of the variant which support the notion of higher infectiousness of B.1.617.2, either due to higher viral burden or higher particle infectivity, resulting in higher probability of person-to-person transmission.
09.09.2021	Early cross-coronavirus reactive signatures of humoral immunity against COVID-19	Science Immunology / Report	<ul style="list-style-type: none">• Authors profile the earliest humoral signatures in a large cohort of acutely ill (survivors and non-survivors) and mild or asymptomatic individuals with COVID-19.• SARS-CoV-2-specific immune response evolved rapidly in survivors of COVID-19, while non-survivors exhibited blunted and delayed humoral immune evolution, particularly with respect to S2-specific antibodies.• Early development of SARS-CoV-2-specific immunity occurred in tandem with pre-existing common β-coronavirus OC43 humoral immunity in survivors, which was also selectively expanded in individuals who develop paucisymptomatic infection.• Suggests importance of cross-coronavirus immunity as a correlate of protection against COVID-19.
08.09.2021	Rate of reinfections after SARS-CoV-2 primary infection in the population of an Italian province: a cohort study	Journal of Public Health / Article	<ul style="list-style-type: none">• Retrospective cohort study included all the population of an Italian Province, diagnosed with a SARS-CoV-2 infection from March 2020 to May 2021• After an average of 201 days of follow-up (max. 414), there were 24 reinfections ≥ 90 days after the resolution of the first 7173 infections (0.33%).• Four reinfections required hospitalisation, one was lethal. Most reinfections (n = 13) occurred 6–9 months after resolution of the first infection; no new infection detected 12 or more months later and among the 832 minors.
03.09.2021	Total Anti-SARS-CoV-2 Antibodies Measured 6 Months After Pfizer-BioNTech COVID-19 Vaccination in Healthcare Workers	SSRN / Article	<ul style="list-style-type: none">• 787 healthcare workers who received a two-dose regimen of Pfizer-BioNTech vaccine, 3 weeks apart underwent serological testing pre-vaccination and then at 1, 3, and 6 months after their second dose

			<ul style="list-style-type: none"> • Median serum levels of total anti-SARS-CoV-2 antibodies reached the peak 1 month after the second vaccine dose, but then tended to decline. Overall, the values after 3- and 6-months were 37% and 57% lower than the corresponding concentrations measured at the peak. • The decline compared to the peak was more accentuated in baseline seropositive persons than in those who were baseline seronegative but values remained considerably higher than the method-dependent cut-off and no seronegativisation was recorded.
03.0 9.20 21	Severe COVID-19 is characterised by inflammation and immature myeloid cells early in disease progression	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Analysis of 108 patients suggests a combination of four features (elevated levels of interleukin-6 and C-reactive protein, coupled with reduced monocyte HLA-DR expression and reduced neutrophil CD10 expression), were strongly predictive of severe disease with an average prediction score of 0.925. • These changes can be identified from tests carried out prior to peak illness severity in a diagnostic laboratory.
07.0 9.20 21	Humoral Responses to Single-Dose BNT162b2 mRNA Vaccination in Dialysis Patients Previously Infected With SARS-CoV-2	Front Med (Lausanne) / Research Article	<ul style="list-style-type: none"> • A dual-centre cohort study comparing three different groups of haemodialysis patients: Group 1: 25 unvaccinated with PCR-confirmed COVID-19 infection. Group 2: 43 patients after 2-dose BNT162b2 vaccination without prior infection and Group 3: 13 patients following single dose vaccination with prior infection. • Haemodialysis patients with prior infection developed a broad and strong antibody reactivity after only one vaccine dose, suggesting that single-dose vaccination might be reasonable in infected dialysis patients as previously shown in healthy controls.

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Vaccines

Publication Date	Title/URL	Journal / Article type	Digest
02.0 9.20 21	Real-World Effectiveness of the mRNA-1273 Vaccine Against COVID-19: Interim Results from a Prospective Observational Cohort Study	SSRN (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Analyses 352,878 recipients of 2 doses of mRNA-1273 (Moderna) vaccine matched to 352,878 unvaccinated individuals in California, USA • Real-world vaccine effectiveness (VE) against: COVID-19 diagnosis (87.4%); hospitalisation (95.8%); hospital death (97.9%). • VE higher against symptomatic (88.3%) than asymptomatic COVID-19 (72.7%), but generally similar across age, sex, and racial/ethnic subgroups. VE among individuals with history of COVID-19 ranged from 8.2-33.6%. • Among fully vaccinated individuals the most prevalent variants were Delta (47.1%), Alpha (21.4%), Gamma (11.4%), Epsilon (4.3%), and Iota (4.3%), while among unvaccinated individuals they were Alpha (41.2%), Epsilon (18.2%), Delta (11.0%) and Gamma (8.6%).

09.0 9.20 21	Does BCG provide long-term protection against SARS-CoV-2 infection? A case-control study in Quebec, Canada	Vaccine / Article	<ul style="list-style-type: none"> • Case-control study with 920 cases and 2123 controls found BCG fails to provide long-term protection against symptomatic or severe forms of COVID-19. • 54% of cases and 53% of controls had received BCG during childhood, while 12% of cases and 11% of controls had received ≥ 2 BCG doses. After adjusting for age, sex, material deprivation, recruiting hospital and occupation there was no evidence of protection conferred by BCG against SARS-CoV-2. • 8.4% of cases needed hospitalization and 2% died. Those vaccinated with BCG were as likely as the unvaccinated to require hospitalization or die.
09.0 9.20 21	Dynamic IgG seropositivity after rollout of CoronaVac and BNT162b2 COVID-19 vaccines in Chile: a sentinel surveillance study	Lancet Infect Dis / Article	<ul style="list-style-type: none"> • 56,261 individuals: 33,533 (59.6%) received at least one dose CoronaVac vaccine; 8947 (15.9%) BNT162b2 [Pfizer]; 13,781 (24.5%) unvaccinated. • IgG positivity remained below 29% after first dose for CoronaVac recipients, peaked at 77% 3 weeks after second dose and decreased thereafter. • IgG positivity high (>70%) from 3 weeks after first dose of BNT162b2, higher (>96%) 3 weeks after second dose, remained above 92% until end of study. • Related comment: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00561-2/fulltext
02.0 9.20 21	Characterization of humoral response to COVID mRNA vaccines in multiple sclerosis patients on disease modifying therapies	Vaccine / Article	<ul style="list-style-type: none"> • Prospective study on COVID-19 mRNA vaccine humoral immune responses in a cohort of 42 patients with multiple sclerosis, 2 with neuromyelitis optica (NMO), 2 with optic neuritis and 7 healthy controls • The rate of seroconversion after vaccination to positive anti-spike RBD was 100% in all groups except patients on B-cell depleting therapies (BCDT), in which it was 36.4%. • It remains possible that an adequate T cell vaccine response could still occur that leads to protection. CD4+ and CD8+ T cell counts remain relatively unchanged after BCDT, which was also seen in the flow cytometry data from the current study. • Additional boosters may be needed to generate a vaccine response as has been shown to significantly increase the antibody response rate in highly immunosuppressed solid organ transplant patients
30.0 8.20 21	Response to SARS-CoV-2 vaccination in immune mediated inflammatory diseases: Systematic review and meta-analysis	Autoimmun Rev / Systematic Review	<ul style="list-style-type: none"> • Systemic review of 25 eligible studies found seroconversion rates after SARS-CoV-2 vaccination are lower in patients with immune mediated inflammatory diseases (IMIDs) and further confirms the importance of a 2-dose vaccine regimen in this population. • Whilst certain therapies (anti-TNF, anti-integrin, anti-IL 17, anti-IL6, anti-IL12/23) do not impact seroconversion rates, anti-CD20, anti-CTLA-4 result in poorer responses.
08.0 9.20 21	Safety of components and platforms of COVID-19 vaccines considered for use in pregnancy: A rapid review	Vaccine / Rapid Review	<ul style="list-style-type: none"> • Rapid systematic review of 38 clinical and non-clinical studies (2,398,855 pregnant persons and 56 pregnant animals). • No evidence was found of pregnancy-associated safety concerns of COVID-19 vaccines, their components or platforms when used in other vaccines.

			<ul style="list-style-type: none"> • These findings support WHO guidelines recommending that pregnant persons consider receiving COVID-19 vaccines, especially those at high risk of exposure or with comorbidities that increase the risk of severe disease.
04.0 9.20 21	Characteristics associated with COVID-19 vaccine uptake among adults in England (08 December to 17 May 2021)	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Study of COVID-19 vaccinations delivered in England from 08 December 2020 to 17 May 2021 (dose one, n=30,624,257; dose two, n=17,360,045). • Among individuals aged ≥50 years, Black/African/Caribbean ethnic group was least likely of all ethnic groups to be vaccinated with dose 1. • Among those aged ≥70 years, the odds of not having dose 2 was 5.53 and 5.36 greater among Pakistani and Black/African/Caribbean compared to White British ethnicity, respectively. • Odds of not receiving dose 2 was 1.18 higher among individuals who lived in a care home compared to those who did not. This was the opposite to that observed for dose 1, where odds of not being vaccinated was higher among those not living in a care home (0.89).
08.0 9.20 21	Attitudes, acceptance and hesitancy among the general population worldwide to receive the COVID-19 vaccines and their contributing factors: A systematic review	EClinicalMedicine / Systematic Review	<ul style="list-style-type: none"> • 209 studies included, conducted in five different continents, Africa (n = 17), America (n = 48), Asia (n = 78), Australia (n = 5), and Europe (n = 53). 8 studies were international in scope. • Data from a single country could report variable results depending when the survey was conducted, the population that was surveyed, and the geographical region/city that was surveyed. • A variety of different factors contributed to increased hesitancy, including having negative perception of vaccine efficacy, safety, convenience, and price. • Socio-demographic groups associated with increased hesitancy included: women, younger participants, and people who were less educated, had lower income, had no insurance, living in a rural area, and self-identified as a racial/ethnic minority

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Diagnosics and genomics

Publication Date	Title/URL	Journal / Article type	Digest
05.0 9.20 21	Clinical performance and accuracy of a qPCR-based SARS-CoV-2 mass-screening workflow for healthcare-worker surveillance using pooled self-sampled gargling solutions: a cross-sectional study	J Infect / Article	<ul style="list-style-type: none"> • Authors evaluate 3 month mass screening of asymptomatic healthcare-workers, utilizing self-sampled gargling-solution / sample pooling for RT-qPCR. • 55,122 individual tests performed for over 7,000 eligible employees. • 2 cases: negative result by gargling solution then positive by NP swab. • Accuracy based on HCWs with gargle-solution and NP-swab available within 3-day-interval (N=521) was 99.5%; sensitivity 88.9% / specificity 99.8%.

02.0 9.20 21	Perceptions on undertaking regular asymptomatic self-testing for COVID-19 using lateral flow tests: a qualitative study of university students and staff	BMJ Open / Article	<ul style="list-style-type: none"> • Interviewed 18 / surveyed 214 participants in Uni. of Oxford weekly testing feasibility study, Oct2020 - Jan2021. • Findings: clear messages highlighting regular testing benefits for family, friends, society in identifying asymptomatic cases; transparent communication about LFTs accuracy, how to act on positive / negative results. • Concerns about safety, convenience of testing, ability to do tests need addressing to ensure successful scaling up of asymptomatic testing.
07.0 9.20 21	Dynamics of SARS-CoV-2 mutations reveals regional-specificity and similar trends of N501 and high-frequency mutation N501Y in different levels of control measures	Sci Rep / Article	<ul style="list-style-type: none"> • Analyses 1,058,020 SARS-CoV-2 from sequenced COVID-19 cases from 98 countries • An estimated 115 mutations are present in more than 3% of global COVID-19 cases, and authors determined three types of mutation dynamics: high-frequency, medium-frequency, and low-frequency • Medium-frequency mutations are characterised by high prevalence in specific regions and/or in constant competition with other mutations in several regions. • Taking N501Y mutation as representative of high-frequency mutations, authors demonstrate that level of control measure [NPIs] stringency negatively correlates with effective R number of SARS-CoV-2 with high-frequency or not-high-frequency and both follows similar trends in different levels of stringency.
07.0 9.20 21	Ineffective neutralization of the SARS-CoV-2 Mu variant by convalescent and vaccine sera	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Authors demonstrate that Mu variant is highly resistant to sera from COVID-19 convalescent and BNT162b2 (Pfizer-BioNTech) vaccinated individuals. • Direct comparison of different SARS-CoV-2 spike proteins revealed Mu spike is more resistant to serum-mediated neutralisation than all other currently recognised variants of interest (VOI) and concern (VOC), including the Beta variant (B.1.351).

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Epidemiology and clinical - children and pregnancy

Publication Date	Title/URL	Journal / Article type	Digest
10.09 .2021	Hospitalizations Associated with COVID-19 Among Children and Adolescents - COVID-NET, 14 States, March 1, 2020-August 14, 2021	MMWR Morb Mortal Wkly Rep / Article	<ul style="list-style-type: none"> • Analysis of COVID-NET data from 14 US States [1 March to 14 August 2021] found weekly COVID-19-associated hospitalisation rates among children and adolescents (0-17 year) rose nearly five-fold from late June to mid-August 2021, coinciding with increased circulation of Delta variant. • The proportions of hospitalised children and adolescents with severe disease were similar before and during the period of Delta predominance.

			<ul style="list-style-type: none"> • Hospitalisation rates were 10 times higher among unvaccinated than among fully vaccinated adolescents.
20.08 .2021	Pregnancy related risks associated with COVID-19: a rapid review	SPOR Evidence Alliance / Rapid Review	<ul style="list-style-type: none"> • Rapid review included 343 publications: only low summary evidence was available • Pregnant women testing positive for COVID-19 are more likely to be admitted to ICU. Maternal deaths were higher during the pandemic compared to pre-pandemic. • Large variability in rates of: i) Severe illness (Median = 11.7%); ii) ICU admission (Median = 5.6%); and Death (Median = 1.0%). • Most COVID-19 diagnoses occurred in third trimester (Median = 90.2%). • Little data available on association between genomic variants and outcomes during pregnancy. • No consensus on whether common comorbidities (obesity, diabetes, or hypertension) are associated with higher risk of COVID-19 infection or severe complications. • Physiologic adaptive changes during pregnancies (e.g. altered immune response) make pregnant women at a high-risk for viral respiratory infections.
07.09 .2021	Effectiveness of the BNT162b2 mRNA COVID-19 vaccine in pregnancy	Nat Med / Article	<ul style="list-style-type: none"> • 10,861 vaccinated Israeli women matched to unvaccinated pregnant controls. • 26%, 48%, 26% of pregnancies in first, second, third trimesters, respectively. • BNT162b2 [Pfizer] vaccine highly effective in pregnant women for original strain and B.1.1.7 (Alpha) variant; vaccine effectiveness comparable to that estimated in general population.
08.09 .2021	Receipt of mRNA Covid-19 Vaccines and Risk of Spontaneous Abortion	N Engl J Med / Corresponde nce	<ul style="list-style-type: none"> • 2456 participants enrolled in CDC v-safe Covid-19 pregnancy registry • Risk of spontaneous abortion after mRNA vaccination before conception or during pregnancy is consistent with expected risk of spontaneous abortion. • See also: https://jamanetwork.com/journals/jama/fullarticle/2784193

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Epidemiology and clinical - long-term complications / sequelae

Publication Date	Title/URL	Journal / Article type	Digest
01.09.20 21	Kidney Outcomes in Long COVID	J Am Soc Nephrol / Research	<ul style="list-style-type: none"> • US veteran cohort (identified 01.03.2020-15.03.2021); 89,216 30-day COVID-19 survivors / 1,637,467 non-infected controls. • Graded increase in risks of post-acute kidney outcomes according to severity of acute COVID-19 infection: excess eGFR decline of -3.26, -5.20, and -7.69 mL/min/1.73m²/year in non-hospitalized, hospitalized, and those in ICU. • Increased risk of post-acute kidney outcomes evident even among those who did not experience acute kidney injury (AKI) in acute phase. • Associated BMJ comment: https://www.bmj.com/content/374/bmj.n2189

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Epidemiology and clinical – risk factors

Publication Date	Title/URL	Journal / Article type	Digest
08.09.2021	Baseline SARS-CoV-2 Viral Load is Associated With COVID-19 Disease Severity and Clinical Outcomes: Post-Hoc Analyses of a Phase 2/3 Trial	J Infect Dis / Article	<ul style="list-style-type: none"> • Nasopharyngeal or oropharyngeal swab specimens were collected from 1362 COVID-19 hospitalized patients to measure viral load and analyse against clinical outcomes over 60 days • Baseline viral load was significantly higher in critical patients on invasive mechanical ventilation (IMV) and patients with multisystem organ dysfunction (MSOD), compared to severe patients or critical patients not on IMV. • Baseline viral load was significantly higher in patients aged ≥ 60 years compared to patients aged < 60 years. Viral loads were similar across other variables, including sex, obesity, diabetes, and hypertension status. • Findings demonstrate that baseline viral load may be an important determinant of clinical outcomes in hospitalised patients with COVID-19
08.09.2021	Cholesterol and Triglyceride Concentrations, COVID-19 Severity, and Mortality: A Systematic Review and Meta-Analysis With Meta-Regression	Front Public Health / Systematic Review	<ul style="list-style-type: none"> • Meta-analysis of 22 studies with a total of 10,122 COVID-19 patients found that hospitalized patients with severe disease, or those who died, had significantly lower total cholesterol, LDL-cholesterol, and HDL-cholesterol, but not triglyceride, concentrations compared to patients with milder disease.
02.09.2021	Increased risk of severe clinical course of COVID-19 in carriers of HLA-C*04:01	EClinicalMedicine / Research Paper	<ul style="list-style-type: none"> • Study of human leukocyte antigen alleles (HLA) as potential genetic host factors that affect individual immune response to SARS-CoV-2. • Association between COVID-19 severity and HLAs in 435 individuals, across 4 countries (enrolled Mar-Aug 2020). • HLA-C*04:01 carriers had twice the risk of intubation with SARS-CoV-2. • HLA association analysis replicated with genome-wide association studies. • COVID-19 severity associated with at least one HLA allele.
04.09.2021	COVID-19 susceptibility variants associate with blood clots, thrombophlebitis and circulatory diseases	PLoS One / Article	<ul style="list-style-type: none"> • Phenome-Wide Association Analyses (PheWAS) using the maximum of 379,655 White British participants in the UK Biobank, to evaluate the association between genetically determined COVID-19 susceptibility and severity with a comprehensive set of phenotypes and diseases. • Significant associations were found of genetically determined COVID-19 susceptibility with increased blood clot events in leg and lungs, thrombophlebitis and circulatory diseases.
08.09.2021	Cigarette smoke preferentially induces full length ACE2 exposure in primary human airway cells but does not alter susceptibility to SARS-CoV-2 infection	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Authors exposed differentiated air-liquid interface cultures derived from primary human airway stem cells to cigarette smoke extract (CSE) and infected them with SARS-CoV-2 • CSE increased expression of full-length ACE2 (fACE2) but did not alter the expression of a Type I-interferon sensitive truncated ACE2 that lacks the capacity to bind SARS-CoV-2 or a panel of interferon-sensitive genes. Additionally, exposure to CSE did not increase viral infectivity despite increase in fACE2

- Data is consistent with epidemiological data suggesting current smokers are not at excess risk of SARS-CoV-2 infection.

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Epidemiology and clinical – other

Publication Date	Title/URL	Journal / Article type	Digest
06.09.2021	Severity of SARS-CoV-2 alpha variant (B.1.1.7) in England	Clin Infect Dis / Accepted manuscript	<ul style="list-style-type: none"> • Study using data from 185,234 people in England who tested positive for SARS-CoV-2 in the community (alpha=93,153; wild-type=92,081) found alpha variant was associated with 73% higher hazards of all-cause death (aHR: 1.73) and 62% higher hazards of hospital admission (aHR: 1.62), compared to wild-type virus. • Among patients already admitted to ICU, the association between alpha and increased all-cause mortality was smaller and the confidence interval included the null (aHR: 1.20).
07.09.2021	Mental and neurological disorders and risk of COVID-19 susceptibility, illness severity and mortality: A systematic review, meta-analysis and call for action	EclinicalMedicine / Article	<ul style="list-style-type: none"> • Systematic review and meta-analysis including 149 studies (227,351,954 participants, 89,235,737 COVID-19 patients) found that overall, mental and neurological disorders were associated with a significant high risk of infection (pre-existing mental: OR 1.67; and pre-existing neurological: 2.05), illness severity (mental: pre-existing, 1.40; sequelae, 4.85; neurological: pre-existing, 1.43; sequelae, 2.17), and mortality (mental: pre-existing, 1.47; neurological: pre-existing, 2.08; sequelae, 2.03) from COVID-19. • Association with illness severity was stronger among younger COVID-19 patients, and those with subsequent mental disorders, living in low- and middle-income regions. • Younger patients with mental and neurological disorders were associated with higher mortality than elders. • Authors also detail the COVID-19 risks (infection, severity and mortality) for specific mental and neurological disorders.
07.09.2021	Viral Coinfection among COVID-19 Patient Groups: An Update Systematic Review and Meta-Analysis	Biomed Res Int / Systematic review	<ul style="list-style-type: none"> • Systematic review and meta-analysis of 33 studies with total of 10,484 patients. • Prevalence of coinfection with COVID-19 was found to vary according to geographical region, with the Western Pacific having the highest prevalence and the Eastern Mediterranean with the lowest. • Coinfections are most prevalent among infected patients with blood-borne viruses such as HIV or Hepatitis C; the lowest rate of coinfection was among those with respiratory viruses
05.09.2021	Monitoring populations at increased risk for SARS-CoV-2 infection in the community	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Authors develop a real-time screening process using results from UK nose and throat swabs and questionnaires taken 19 July 2020-17 July 2021. Of 4,091,537 RT-PCR results from 482,677 individuals, 29,903 (0.73%) were positive.

			<ul style="list-style-type: none"> • As positivity rose September-November 2020, rates were independently higher in younger ages, and those living in Northern England, major urban conurbations, more deprived areas, and larger households. Rates were also higher in those returning from abroad, and working in healthcare or outside of home. • When positivity peaked December 2020-January 2021 (Alpha), high positivity shifted to southern geographical regions. • With national vaccine roll-out from December 2020, positivity reduced in vaccinated individuals. Associations attenuated as rates decreased between February-May 2021. • Rising positivity rates in June-July 2021 (Delta) were higher in younger, male, and unvaccinated groups. 25/45 (56%) confirmed associations would have been detected later using 28-day rather than 14-day periods.
05.0 9.20 21	No difference in risk of hospitalisation between reported cases of the SARS-CoV-2 Delta variant and Alpha variant in Norway	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Cohort study of confirmed cases of SARS-CoV-2 in Norway, diagnosed between 3 May and 15 August 2021 (7,977 cases of Delta and 12,078 cases of Alpha). Overall, 347 (1.7%) cases were hospitalised. • Adjusted risk ratios (aRR) of hospitalisation for Delta compared to Alpha was 0.97. • Reduced risk of hospitalisation was found in partially vaccinated (72%) and fully vaccinated cases (76% reduced risk), compared to unvaccinated cases. • Suggests little difference in the risk of hospitalisation for Delta cases compared to Alpha cases in Norway.

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Transmission

Publication Date	Title/URL	Journal / Article type	Digest
07.0 9.20 21	SARS-CoV-2 circulation in the school setting: A systematic review and meta-analysis	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Systematic review and meta-analysis up to 15 May 2021. • Screening studies (approx. 120,000 subjects) suggest an estimated 0.31% SARS-CoV-2 point prevalence in schools. • Contact tracing studies (n=112,622 contacts of children and adults) suggest that onward viral transmission was limited (2.54%); young index cases were 74% significantly less likely than adults to favor viral spread (OR=0.26) and were less susceptible to infection (OR=0.60). • Seroprevalence studies (n=17,879 subjects) suggest children are 43% significantly less likely than adults to test positive for antibodies (OR=0.57).

26.0 8.20 21	Mass Outdoor Events and the Spread of an Airborne Virus: English Football and COVID-19	University of Reading (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Investigation into the extent to which attendance at English football matches in February and March 2020 contributed to Covid-19 cases and deaths in local areas in March and April 2020. • Research suggests that an additional match taking place in an area in March increased April Covid deaths in that area by 2 or 3 per 100,000 people, and impacts the spread both in the area where the match takes place and the area from which away supporters have travelled from • These impacts could be observed even when the stadia were far from full
28.0 8.20 21	Nosocomial or not? A combined epidemiological and genomic investigation to understand hospital-acquired COVID-19 infection on an elderly care ward	Infect Prev Pract / Outbreak Report	<ul style="list-style-type: none"> • Epidemiological, genomic, and cluster analyses to describe the epidemiology and identify factors contributing to an outbreak in a UK hospital in May-June 2020 • 14 cases were identified on a single ward and contact tracing identified 16 further patient cases. Asymptomatic testing also identified Eight COVID-19 positive healthcare workers (HCWs) • Despite the temporal relationship of cases, genome sequencing identified that not all cases shared transmission events. • 11 samples were found to be closely related and these likely represented in-hospital transmission. This included three HCWs, thereby confirming transmission between patients and HCWs.
03.0 9.20 21	Transmission of SARS-CoV-2 associated with aircraft travel: A systematic review	J Travel Med / Systematic review	<ul style="list-style-type: none"> • Systematic review including 20 studies: 18 on in-flight SARS-CoV-2 transmission (130 unique flights) and 2 on wastewater from aircraft. • In the index cases, laboratory diagnosis was based on RT-PCR in all 18 studies; overall, 273 index cases were reported across 18 studies. In total, 64 secondary cases were reported (59 passengers and 5 crew members). • Current evidence suggests SARS-CoV-2 can be transmitted during aircraft travel; however study design was found to be heterogenous and published data do not permit conclusive assessment of likelihood and extent. • Preprint previously included
27.0 8.20 21	Transmission of COVID-19 and other infectious diseases in public washrooms: A systematic review	Science of the Total Environment / Article	<ul style="list-style-type: none"> • Systematic review (38 studies from 13 countries) found that widespread bacterial and/or viral contamination in washrooms could result from open-lid toilet flushing, ineffective handwashing or hand drying, substandard or infrequent surface cleaning, blocked drains, and uncovered rubbish bins. • Only a few cases of infectious diseases were reported, mostly related to faecal-oral transmission originating from washrooms in restaurants . • Although there is a risk of microbial aerosolisation from toilet flushing and the use of hand drying systems, we found no evidence of airborne transmission of enteric or respiratory pathogens, including COVID-19, in public washrooms. • Appropriate hand hygiene, surface cleaning and disinfection, and washroom maintenance and ventilation are likely to minimise risk of transmission.

08.0 9.20 21	Effect of Vaccination on Transmission of SARS-CoV-2	N Engl J Med / Correspondence	<ul style="list-style-type: none"> Public Health Scotland study: analysis of data from 194,362 household members of 144,525 health care workers (78.4% HCW received at least one vaccine / 25.1% both). Covid-19 cases among household members of vaccinated HCW lower during period beginning 14 days after first dose than during unvaccinated period before first dose (5.93 versus 9.40 per 100 person-years respectively). After HCW's second dose, rate in household members lower still (2.98 cases).
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Treatment

Publication Date	Title/URL	Journal / Article type	Digest
03.0 9.20 21	Effectiveness of corticosteroids to treat severe COVID-19: A systematic review and meta-analysis of prospective studies	Int Immunopharmacol / Systematic Review	<ul style="list-style-type: none"> Systematic review of seven randomised controlled trials and one prospective cohort study with a total of 6771 patients, of which 2715 received corticosteroids and 4056 received standard care. Meta-analysis found that treatment with corticosteroids was associated with lower mortality in cases of severe COVID-19, especially when administered at an early stage of the infection
08.0 9.20 21	Metformin in Patients With COVID-19: A Systematic Review and Meta-Analysis	Front Med (Lausanne) / Systematic Review	<ul style="list-style-type: none"> Systematic review included 28 studies with a total of 2,910,462 participants Meta-analysis of 19 studies showed that metformin is associated with 34% lower COVID-19 mortality and 27% lower hospitalization rate.
08.0 9.20 21	COVID-19 recovery: benefits of multidisciplinary respiratory rehabilitation	BMJ Open Respir Res / Perspective	<ul style="list-style-type: none"> Results of 22 adult patients with COVID-19 who were enrolled on a multidisciplinary rehabilitation programme, of whom 16 completed the 3-month evaluation. Evaluation was performed after 6 weeks and 3 months. Patients underwent clinical assessment, pulmonary function testing, 6-minute walking distance (6MWD) test, hand grip force (HGF), quadriceps force, maximal inspiratory and expiratory pressure, and cardiopulmonary exercise test (CPET). Exercise training, especially with companions, has a positive influence on mental health and cognitive symptoms. All physical variables showed significantly better values after the 3-month programme
03.0 9.20 21	Early treatment of COVID-19 with anakinra guided by soluble urokinase plasminogen receptor plasma levels: a double-blind, randomized controlled phase 3 trial	Nat Med / Article	<ul style="list-style-type: none"> Multicentre trial with final cohort of 594 patients, 405 patients were treated with anakinra and 189 with placebo 50.4% of patients receiving anakinra had fully recovered with no viral RNA detected on day 28 compared to 26.5% of the placebo group.

			<ul style="list-style-type: none"> • 3.2% of patients in the anakinra group died, compared with 6.9% of the placebo group • Authors conclude that early start of treatment with anakinra guided by suPAR levels in patients hospitalized with moderate and severe COVID-19 significantly reduced the risk of worse clinical outcome at day 28. • Preprint previously included
30.08.2021	Casirivimab-Imdevimab treatment is associated with reduced rates of hospitalization among high-risk patients with mild to moderate coronavirus disease-19	EclinicalMedicine / Research Paper	<ul style="list-style-type: none"> • Retrospective US cohort study with 696 patients treated with casirivimab–imdevimab and an equal number of untreated patients with mild to moderate COVID-19 between 04.02.2021 and 09.04.2021. Primary outcome was rate of hospitalization at days 14, 21 and 28 after infusion. • High-risk characteristics were hypertension (52.4%), body mass index ≥ 35 (31.0%), diabetes mellitus (24.6%), chronic lung disease (22.1%), chronic renal disease (11.4%), congestive heart failure (6.6%), and compromised immune function (6.7%). • Among high-risk patients with mild to moderate COVID-19, casirivimab–imdevimab treatment was associated with a significantly lower rate of hospitalization.

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Modelling

Publication Date	Title/URL	Journal / Article type	Digest
27.09.2021	Vaccinating Adolescents and Children Significantly Reduces Covid-19 Morbidity and Mortality Across All Ages: A Population-Based Modeling Study Using the UK as an Example	SSRN (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Novel SEIR disease transmission model: impact of different vaccination strategies on population-level infections / clinical outcomes. Age- and time-dependent social mixing patterns capture impact of changes in restrictions. • Significant increases in UK Covid-19 cases following relaxation of restrictions 19.07.21, if vaccines limited to ≥ 18 years / vulnerable adolescents (≥ 12 years). • Approx 60% new infections in < 18 years, with these individuals accounting for 14% hospital admissions, 61% long Covid cases and 0.2% deaths. • Including adolescents and children in the vaccination programme could reduce overall Covid-related mortality by 57% and long Covid by 75%.
08.09.2021	Comparison of antigen- and RT-PCR-based testing strategies for detection of SARS-CoV-2 in two high-exposure settings	PLoS One / Article	<ul style="list-style-type: none"> • Findings from a modelling study investigating five testing strategies in two different settings, a nursing home and a university dormitory system. • 10,000 stochastic simulations were carried out for each testing strategy in each setting and all testing strategies reduced the peak and total infections in simulated epidemic. A greater reduction was achieved with higher rates of daily screening.

- Overall, surveillance testing reduces the disease burden in populations, and strategies that use antigen tests can be considered as highly effective, cost-reducing alternatives to PCR testing strategies.

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Guidance and consensus statements

Publication Date	Title/URL	Journal / Article type
03.09.2021	JCVI statement on COVID-19 vaccination of children aged 12 to 15 years	Department of Health and Social Care / Independent Report

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Overviews, comments and editorials

Publication Date	Title/URL	Journal / Article type
27.08.2021	COVID-19 and immune-mediated inflammatory diseases: effect of disease and treatment on COVID-19 outcomes and vaccine responses	Lancet Rheumatol / Review
03.09.2021	Calming the cytokine storm in COVID-19	Nat Med / Editorial
07.09.2021	Impact of the Delta variant on vaccine efficacy and response strategies	Expert Rev Vaccines / Review
03.09.2021	Covid-19: JCVI opts not to recommend universal vaccination of 12-15 year olds	BMJ / News
01.09.2021	Vaccinating adolescents wisely against COVID-19	BMJ Paediatr Open
03.09.2021	Safety Surveillance of COVID-19 mRNA Vaccines Through the Vaccine Safety Datalink	Jama / Editorial
02.09.2021	Covid-19: UK will offer third vaccine dose to severely immunosuppressed people	BMJ / News
29.08.2021	COVID-19 vaccine use in immunocompromised patients: A commentary on evidence and recommendations	American Journal of Health-System Pharmacy / Comment
05.09.2021	The origins of SARS-CoV-2: A critical review	Cell / Review
09.09.2021	The next phase of SARS-CoV-2 surveillance: real-time molecular epidemiology	Nature Medicine / Review
07.09.2021	Kids and COVID: why young immune systems are still on top	Nature / News Feature

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