



COVID-19 Literature Digest – 02/09/2020

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- Serology and immunology
- Diagnostics
- Genomics
- Epidemiology and clinical - children and pregnancy
- Epidemiology and clinical - risk factors
- Epidemiology and clinical - other
- Infection control
- Treatment
- Modelling
- Overviews, comments and editorials (no digest)

Please note that we are including preprints (**highlighted in red**), which are preliminary reports of work that have NOT been peer-reviewed. They should not be relied on to guide clinical practice or health-related behaviour and should NOT be reported in news media as established information.

Serology and immunology

Publication Date	Title / URL	Journal / Article type	Digest
25.08.2020	Antibody response to SARS-CoV-2 infection in humans: a systematic review	medRxiv (non-peer reviewed) / Systematic review	<ul style="list-style-type: none">• This review comprehensively evaluated evidence describing the antibody response to SARS-CoV-2 published from 01/01/2020-26/06/2020. 150 papers were included.• Published literature on immune responses to SARS-CoV-2 is of variable quality with considerable heterogeneity with regard to methods, study participants, outcomes measured and assays used.

			<ul style="list-style-type: none"> • Antibody dynamics have been evaluated thoroughly in the acute phase but longer follow up and a comprehensive assessment of the role of demographic characteristics and disease severity is needed. The role of protective neutralising antibodies is emerging, with implications for therapeutics and vaccines.
24.08.2020	Cellular immune response to SARS-CoV-2 infection in humans: a systematic review	medRxiv (non-peer reviewed) / Systematic review	<ul style="list-style-type: none"> • Critically evaluates and synthesises the relevant peer-reviewed and pre-print literature published in recent months relating to the cellular immune response to SARS-CoV-2. 61 articles were included. • A complex pattern of T cell response to SARS-CoV-2 infection has been demonstrated, but inferences regarding population level immunity are hampered by significant methodological limitations and heterogeneity between studies. • In contrast to antibody responses, population level surveillance of the cellular response is unlikely to be feasible in the near term. Focused evaluation in specific sub-groups, including vaccine recipients, should be prioritised.
26.08.2020	High rates of SARS-CoV-2 seropositivity in nursing home residents	J Infect / Correspondence	<ul style="list-style-type: none"> • During Mar-Apr 2020 authors investigated outbreaks in four UK nursing homes where 40% of 394 residents tested positive on RT-PCR, including 43% who had no identifiable symptoms in the preceding two week period. • In June, assessed SARS-CoV-2 seroprevalence in same four nursing homes using assays for IgG antibodies. • 72% of nursing home residents (95% CI 66 – 77) were anti-SARS-CoV-2 IgG antibody positive, representing 173 of 241 residents. This includes 93% of those tested who were previously RT-PCR positive (95% CI 85 – 96; 87 of 94) and 59% of those who were previously RT-PCR negative (95% CI 50 – 66, 86 of 147). • 35% of antibody positive residents (95% CI 29 – 43, 62 of 173) had been asymptomatic in the two-week ascertainment window prior to PCR testing during the outbreak. Seropositivity was not associated with the presence of comorbidities (χ^2 P=0.81).
28.08.2020	Antibody Profiles According to Mild or Severe SARS-CoV-2 Infection, Atlanta, Georgia, USA, 2020	Emerg Infect Dis / Article	<ul style="list-style-type: none"> • Among patients COVID-19, IgM levels increased early after symptom onset for those with mild and severe disease, but IgG levels increased early only in those with severe disease. • A similar pattern was observed in a separate serosurveillance cohort. • Mild COVID-19 should be investigated separately from severe COVID-19.

01.08.2020	Mucosal versus systemic antibody responses to SARS-CoV-2 antigens in COVID-19 patients	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Report evidence for sustained SARS-CoV-2 specific IgG and transient IgA and IgM responses both at the site of infection (mucosae) and systemically in COVID-19 patients over 3 months and suggest that saliva could be used as an alternative biofluid for monitoring IgG to SARS-CoV-2 spike and RBD antigens.
27.08.2020	Evaluation of SARS-CoV-2 serology assays reveals a range of test performance	Nat Biotechnol / Article	<ul style="list-style-type: none"> • An evaluation of ten point-of-care-style lateral flow assays (LFAs) and two laboratory-based enzyme-linked immunosorbent assays to detect anti-COVID-19 IgM and IgG antibodies in 5-day time intervals from symptom onset, as well as specificity of each assay in pre-coronavirus disease 2019 specimens. • The percentage of seropositive individuals increased with time, peaking in the latest time interval tested (>20 d after symptom onset). • Test specificity ranged from 84.3% to 100.0% and was predominantly affected by variability in IgM results. • LFA specificity could be increased by considering weak bands as negative, but this decreased detection of antibodies (sensitivity) in a subset of COVID-19 real-time PCR-positive cases.

Diagnosics

Publication Date	Title / URL	Journal / Article type	Digest
28.08.2020	SARS-CoV-2 RNA in serum as predictor of severe outcome in COVID-19: a retrospective cohort study	Clin Infect Dis / Article	<ul style="list-style-type: none"> • Study to determine if SARS-CoV-2 RNA in serum at admission correlated with clinical outcome in COVID-19. Cohort (N=167) consisted of 106 SARS-CoV-2 RNA serum negative and 61 positive patients. • In the serum PCR negative and positive groups 3/106 and 15/61 patients died, respectively. The hazard ratios for critical disease and all-cause mortality were 7.2 (95% CI 3.0-17) and 8.6 (95% CI 2.4-30), respectively for patients that were serum PCR positive compared to serum PCR negative. • SARS-CoV-2 RNA in serum at hospital admission indicates a high-risk of progression to critical disease and death
25.08.2020	SARS-CoV-2-RNA viremia is associated to hypercytokinemia and critical illness in COVID-19	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Determined the association of plasma SARS-CoV-2 RNA with clinical severity, laboratory findings and immunological parameters in a cohort of 250 patients with confirmed COVID-19 infection.

			<ul style="list-style-type: none"> • The prevalence of SARS-CoV-2-RNA viremia increased in parallel with severity of infection (22% in outpatients, 36% in those hospitalised in wards, and 82% in those at the ICU). • SARS-CoV-2-RNA viremia is a robust marker of critical illness in COVID-19. Findings support that hypercytokinemia in COVID-19 is a reactive event in response to the dissemination of viral material at the systemic level.
28.08.2020	Saliva or Nasopharyngeal Swab Specimens for Detection of SARS-CoV-2	N Engl J Med / Correspondence	<ul style="list-style-type: none"> • Study of 70 COVID-19 inpatients to compare saliva specimens with nasopharyngeal swab specimens - authors tested saliva specimens collected by the patients themselves and nasopharyngeal swabs collected from them at same time point by health care workers. • More SARS-CoV-2 RNA copies detected in the saliva specimens (mean log copies per millilitre, 5.58; 95% confidence interval [CI], 5.09 to 6.07) than in the nasopharyngeal swab specimens (mean log copies per millilitre, 4.93; 95% CI, 4.53 to 5.33). • A higher percentage of saliva samples than nasopharyngeal swab samples were positive up to 10 days after the Covid-19 diagnosis. • Less variation in levels of SARS-CoV-2 RNA in the saliva specimens (standard deviation, 0.98 virus RNA copies per millilitre; 95% credible interval, 0.08 to 1.98) than in the nasopharyngeal swab specimens (standard deviation, 2.01 virus RNA copies per millilitre; 95% credible interval, 1.29 to 2.70).
28.08.2020	Salivary Detection of COVID-19	Ann Intern Med / Letter	<ul style="list-style-type: none"> • Study show feasibility of a simple, safe collection tool for salivary detection of SARS-CoV-2 in the setting of a COVID-19 testing centre.

Genomics

Publication Date	Title / URL	Journal / Article type	Digest
28.08.2020	SARS-CoV-2 spike D614G variant exhibits highly efficient replication and transmission in hamsters	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Used the hamster infection model to compare the replication ability and pathogenicity of five SARS-CoV-2 strains isolated from early cases originating in Wuhan, China, in Feb, and infected individuals returning from Europe and elsewhere in Mar 2020. • The HK-13 and HK-95 isolates showed distinct pathogenicity in hamsters, with higher virus titers and more severe pathological

		<p>changes in the lungs observed compared to other isolates. HK-95 contains a D614G substitution in the spike protein and demonstrated higher viral gene expression and transmission efficiency in hamsters.</p> <ul style="list-style-type: none"> • Intra-host diversity analysis revealed that further quasi species were generated during hamster infections, indicating that strain-specific adaptive mutants with advantages in replication and transmission will continue to arise and dominate subsequent waves of SARS-CoV-2 dissemination.
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Epidemiology and clinical – children and pregnancy

Publication Date	Title / URL	Journal / Article type	Digest
28.08.2020	Clinical Characteristics and Viral RNA Detection in Children With Coronavirus Disease 2019 in the Republic of Korea	JAMA Pediatr / Original Investigation	<ul style="list-style-type: none"> • Case series, analysing full clinical course and duration of SARS-CoV-2 RNA detectability in 91 children (under 19 years) confirmed with COVID-19, 18th Feb- 31st Mar 2020. • 20 children (22%) asymptomatic during entire observation period. Among 71 symptomatic cases, 47 children (66%) had unrecognized symptoms before diagnosis, 18 (25%) developed symptoms after diagnosis, and only 6 (9%) were diagnosed at the time of symptom onset. • 22 children (24%) had lower respiratory tract infections. Mean (SD) duration of SARS-CoV-2 RNA in upper respiratory samples was 17.6 (6.7) days. Virus RNA was detected for a mean (SD) of 14.1 (7.7) days in asymptomatic individuals. • No difference in duration of virus RNA detection between children with upper respiratory tract infections and lower respiratory tract infections (mean [SD], 18.7 [5.8] days vs 19.9 [5.6] days; P = .54). • Inapparent infections in children may have been associated with silent COVID-19 transmission in the community.

Epidemiology and clinical - risk factors

Publication Date	Title / URL	Journal / Article type	Digest
25.08.2020	Disparities in the excess risk of mortality in the first wave of COVID-19: cross sectional study of the English sentinel network	J Infect / Article	<ul style="list-style-type: none"> • Authors report the absolute excess risk (AER) of mortality and excess mortality rate (EMR) for weeks 2 to 20 in 2020 from surveillance network data. • AER of mortality was 197.8 per 10,000 person years. Being male, older, of black ethnicity, more deprived, and living in a larger household increased EMR. • Presence of comorbidities also increased EMR. Ranked lowest to highest these were: hypertension, chronic kidney disease, chronic respiratory and heart disease, and cancer or immunocompromised. • The absolute excess mortality was approximately 2 deaths per 100 person years in first wave of COVID-19 in England. • More personalised shielding advice for any second wave should include ethnicity, comorbidity and household size as predictors of risk.
28.08.2020	healthcareCOVID: A national cross-sectional observational study identifying risk factors for developing suspected or confirmed COVID-19 in UK healthcare workers	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Cross-sectional observational study examining prevalence and risk factors for the development of suspected or confirmed COVID-19 infection among healthcare workers (HCWs) in the UK between 1 Feb and 25 May 2020. • Of 6152 eligible responses, confirmed or suspected COVID-19 was present in 1806 (29.4%) HCWs, of whom 49 (0.8%) were hospitalised, 459 (7.5%) tested positive for COVID-19, and 1776 (28.9%) reported self-isolation. • The strongest risk factor was increasing frequency of contact with suspected or confirmed COVID-19 cases without adequate personal protective equipment (PPE). • Several comorbidities (cancer, respiratory disease, and obesity), working in a 'doctors' role, using public transportation for work, regular contact with suspected or confirmed COVID-19 patients, and lack of PPE were also associated.
24.08.2020	Clinical Features Associated with COVID-19 Outcome in MM: First Results from International Myeloma Society COVID-19 Dataset	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • This retrospective study describes the baseline characteristics and outcome data of COVID-19 infection in 650 patients with plasma cell disorders (98 outpatients and 538 hospitalized patients), collected from 10 countries by the International

			<p>Myeloma Society to understand the initial challenges faced by Myeloma patients during COVID-19 pandemic.</p> <ul style="list-style-type: none"> • Thirty-three percent of patients have died, with significant geographic variability, ranging from 27% to 57% of hospitalized patients. • Univariate analysis identified age, ISS3, high-risk disease, renal disease, suboptimal myeloma control (active or progressive disease), and one or more comorbidities as risk factors for higher rates of death.
24.08.2020	An initial report from the French SOT COVID Registry suggests high mortality due to Covid-19 in recipients of kidney transplants	Kidney Int / Clinical Investigation	<ul style="list-style-type: none"> • Registry-based observational study to explore characteristics and clinical outcomes of recipients of kidney transplants included in the French nationwide Registry of Solid Organ Transplant Recipients with Covid-19. 279 patients, 243 were admitted to hospital and 36 were managed at home. • Severe Covid-19 occurred in 106 patients (46%). 43 hospitalized patients died (30-day mortality 22.8%). Overweight, fever, and dyspnea identified as independent risk factors for severe disease. Over 60 years old, cardiovascular disease, and dyspnea were independently associated with mortality. • Covid-19 in recipients of kidney transplants portends a high mortality rate. Proper management of immunosuppression and tailored treatment of this population remain challenging.
29.08.2020	A national strategy to diagnose COVID-19 associated invasive fungal disease in the ICU	Clin Infect Dis / Article	<ul style="list-style-type: none"> • Study to determine the incidence, risk factors and impact of invasive fungal disease in adult COVID-19 patients with severe respiratory distress. • 135 adults (median age: 57, M/F: 2-2/1) screened. Incidence was 26.7% (14.1% aspergillosis, 12.6% yeast infections). Overall mortality rate was 38%; 53% and 31% in patients with and without fungal disease, respectively (P: 0.0387). • Mortality rate reduced by the use of antifungal therapy (Mortality: 38.5% in patients receiving therapy versus 90% in patients not receiving therapy (P: 0.008). • Use of corticosteroids (P: 0.007) and history of chronic respiratory disease (P: 0.05) increased the likelihood of aspergillosis. • Fungal disease occurs frequently in critically ill, mechanically ventilated COVID-19 patients. Screening using a strategic diagnostic approach and antifungal prophylaxis of patients with

risk factors will likely enhance the management of COVID-19 patients.

Epidemiology and clinical – other

Publication Date	Title / URL	Journal / Article type	Digest
26.08.2020	COVID-19 infection dynamics in care homes in the East of England: a retrospective genomic epidemiology study	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Between 26 Feb and 10 May 2020 a total of 7,406 COVID-19 positive samples from 6,600 patients in the East of England were identified, of which 1,167 (18.2%) were residents from 337 care homes. • 30/71 (42.3%) care home residents tested at Cambridge University Hospitals NHS Foundation Trust died. • Genomes were available for 700/1,167 (60%) residents from 292 care homes, and 409 distinct viral clusters were defined. • The authors identified several probable transmissions between care home residents and healthcare workers.
25.08.2020	SARS-CoV-2 infection of human iPSC-derived cardiac cells predicts novel cytopathic features in hearts of COVID-19 patients	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • COVID-19 causes cardiac dysfunction in up to 50% of patients, but pathogenesis remains unclear. • Infection of human iPSC-derived cardiomyocytes with COVID-19 revealed transcriptomic and morphological signatures of damage in cardiomyocytes. • Morphological signatures include a pattern of sarcomere fragmentation, specific cleavage of thick filaments, and numerous iPSC-cardiomyocytes that lacked nuclear DNA. • Human autopsy specimens from COVID-19 patients displayed marked sarcomeric disruption and similar fragmentation, as well as prevalently enucleated cardiomyocytes.
30.08.2020	SARS-CoV-2 infects human pluripotent stem cell-derived cardiomyocytes, impairing electrical and mechanical function	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • Examine the cardiac tropism of SARS-CoV-2 using human pluripotent stem cell-derived cardiomyocytes (hPSC-CMs) and three-dimensional engineered heart tissues (3D-EHTs). • Observe that hPSC-CMs express the viral receptor ACE2 and other viral processing factors, and that SARS-CoV-2 readily infects and replicates within hPSC-CMs, resulting in rapid cell death. • Moreover, infected hPSC-CMs show a progressive impairment in both electrophysiological and contractile properties. Thus, COVID-19-related cardiac symptoms likely result from a direct cardiotoxic

			effect of SARS-CoV-2. Long-term cardiac complications might be possible sequelae in patients who recover from this illness.
28.08.2020	Patient Characteristics and Outcomes of 11,721 Patients with COVID19 Hospitalized Across the United States	Clin Infect Dis / Article	<ul style="list-style-type: none"> • A study examining characteristics of 11,721 COVID-19 patients across 38 US States (majority were >60 years of age [59.9%] and male [53.4%]).
26.08.2020	What is the recovery rate and risk of long-term consequences following a diagnosis of COVID-19? - A harmonised, global longitudinal observational study	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • An international open-access prospective, observational multi-site study aims to characterize frequency of and risk factors for long-term consequences following a diagnosis of COVID-19, characterise patient immune response over time, and facilitate standardised and longitudinal data collection globally.
27.08.2020	Susceptibility of rabbits to SARS-CoV-2	bioRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • The authors demonstrate the susceptibility of rabbits to COVID-19, which excrete infectious virus from the nose and throat upon experimental inoculation. • Suggests that investigations on the presence of COVID-19 in farmed rabbits should be considered.

Infection control

Publication Date	Title / URL	Journal / Article type	Digest
01.09.2020	Community Outbreak Investigation of SARS-CoV-2 Transmission Among Bus Riders in Eastern China	JAMA Intern Med / Original investigation	<ul style="list-style-type: none"> • Cohort study of 128 individuals who rode 1 of 2 buses and attended a worship event in Eastern China, 100 minute round trip. • On bus 2, 24 of 68 individuals (35.3% [including index patient]) diagnosed with COVID-19 after the event. No-one on bus 1 (60 individuals) were infected. • Within bus 2, individuals in high-risk zones (proximity to index patient) had moderately, but non significantly, higher risk for COVID-19 - this suggests airborne spread may at least partially explain the markedly high attack rate observed. In both buses, central air conditioners were in indoor recirculation mode. • Airborne transmission may partially explain the increased risk of SARS-CoV-2 infection among these bus riders.
28.08.2020	Outbreak of COVID-19 in a nursing home associated with aerosol transmission as a result of inadequate ventilation	Clin Infect Dis / Correspondence	<ul style="list-style-type: none"> • 17 (81%) residents from one of the seven wards in a Dutch nursing home with psychogeriatric residents were diagnosed with COVID-19 plus 17 (50%) healthcare workers (HCWs) of same ward. In contrast, all tests of the 106 HCWs or 95 residents in the 6 other wards were negative.

			<ul style="list-style-type: none"> • Outbreak likely to be the result of aerosol transmission in a setting of inadequate ventilation: (i) near simultaneous detection of COVID-19 infections of almost all residents HCWs within a ward in which care was provided with surgical masks; (ii) limitation of outbreak to this ward, with a deviating ventilation system that recirculated unfiltered inside air plus detection of COVID-19 on filters of this system; (iii) outbreak when low prevalence of COVID-19 infections in community.
28.08.2020	COVID-19 patients in earlier stages exhaled millions of SARS-CoV-2 per hour	Clin Infect Dis / Article	<ul style="list-style-type: none"> • COVID-19 patients (49, with 15 healthy subjects as controls) recruited in Beijing exhaled millions of SARS-CoV-2 RNA copies into the air per hour. • Exhaled breath samples had the highest positive rate (26.9%, n=52), followed by surface swabs (5.4%, n=242), and air samples (3.8%, n=26). • Exhaled breath emission may play an important role in the COVID-19 transmission; affected by many factors such as disease stage, patient activity, and possibly age. Highest, up to 105 viruses per min, during the earlier stages of COVID-19.
29.08.2020	Viral spreading in asymptomatic cases with SARS-CoV-2 infections: a Pilot study	J Infect / Letter	<ul style="list-style-type: none"> • A study to evaluate the daily viral spreading and environmental contamination around asymptomatic patients (n=10) infected by COVID-19, sampling 3 surfaces before cleaning (mobile phone, doorbell, and patient over bed table), as well as surgical masks worn 30 minutes by the patients during clinical examination. • Only one patient (P9) became symptomatic with coughing at day 5 after inclusion. • The most frequent contaminated samples were the phone and over bed table in 44% of cases whereas masks and ring bell were respectively contaminated in 38% and 28% of cases.
01.09.2020	Probable Evidence of Fecal Aerosol Transmission of SARS-CoV-2 in a High-Rise Building	Ann Intern Med / Original Research	<ul style="list-style-type: none"> • Authors investigate temporal and spatial distributions of 3 infected families in a high-rise apartment building; examine role of faecal aerosols. • First family had travelled to Wuhan (COVID-19 epicentre); other 2 families had no travel history and a later onset of symptoms. • The families lived in 3 vertically aligned flats connected by drainage pipes in master bathrooms. Both the observed infections and the locations of positive environmental samples are consistent with the vertical spread of virus-laden aerosols via these stacks and vents.

25.08.2020	Antimicrobial Stewardship Program, COVID-19, and Infection Control: Spread of Carbapenem-Resistant Klebsiella Pneumoniae Colonization in ICU COVID-19 Patients. What Did Not Work?	J Clin Med / Article	<ul style="list-style-type: none"> • A retrospective study analysed bi-monthly incidence of Carbapenem-Resistant <i>Enterobacteriaceae</i> (CRE) colonisation patients and the incidence of CRE acquisition in an ICU which had implemented an antimicrobial stewardship program. • CRE acquisition actually increased from 6.7% in 2019 to 50% in Mar-Apr 2020. • It was noted that 67% of patients that had been changed in posture with prone position were colonized by CRE, while only 37% of patients that had not been changed in posture were colonized by CRE. • The authors suggest the high intensity of care, the prone position requiring 4-5 healthcare workers (HCWs), and the presence of 32 new HCWs from other departments and without work experience in the ICU setting, contributed to the spread of Carbapenem-Resistant Klebsiella pneumoniae (CR-Kp) in this ICU, determining an increase in CRE acquisition.
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Treatment

Publication Date	Title / URL	Journal / Article type	Digest
01.09.2020	Oxygen targets in the intensive care unit during mechanical ventilation for acute respiratory distress syndrome: a rapid review	Cochrane Database Syst Rev / Review	<ul style="list-style-type: none"> • Rapid review to address how oxygen therapy should be targeted in adults with ARDS (particularly secondary to COVID-19) and requiring mechanical ventilation in ICU: impact oxygen therapy has on mortality, days ventilated, days of catecholamine use, requirement for renal replacement therapy, and quality of life. • Authors identified only one RCT with a total of 205 participants exploring this question, and rated risk of bias as high / certainty of the findings as very low. • Uncertainty as to whether a higher or lower oxygen target is more beneficial in patients with ARDS and receiving mechanical ventilation in an intensive care setting. Further well-conducted studies urgently needed.

Modelling

Publication Date	Title / URL	Journal / Article type	Digest
24.08.2020	Real-time Nowcasting and Forecasting of COVID-19 Dynamics in England: the first wave?	medRxiv (non-peer reviewed) / Article	<ul style="list-style-type: none"> • The real-time pandemic monitoring presented here has contributed to the evidence informing this pandemic management. • Estimates on the 10th May showed lock-down had reduced transmission by 75%, the reproduction number falling from 2.6 to 0.61. This regionally-varying impact was largest in London of 81% (95% CrI: 77%-84%). • Reproduction numbers have since slowly increased, and on 19th June the probability that the epidemic is growing was greater than 50% in two regions, South West and London. • An estimated 8% of the population had been infected, with a higher proportion in London (17%). The infection-to-fatality ratio is 1.1% (0.9%-1.4%) overall but 17% (14%-22%) among the over-75s. • This ongoing work will be key to quantifying any widespread resurgence should accrued immunity and effective contact tracing be insufficient to preclude a second wave.

Overviews, comments and editorials

Publication Date	Title / URL	Journal / Article type
27.08.2020	The dynamic changes in cytokine responses in COVID-19: a snapshot of the current state of knowledge	Nat Immunol / Meeting report
27.08.2020	COVID-19 vaccine trials should seek worthwhile efficacy	Lancet / Comment
01.09.2020	SARS-CoV-2: The Growing Case for Potential Transmission in a Building via Wastewater Plumbing Systems	Ann Intern Med / Editorial
28.08.2020	Symptomatic and Asymptomatic Viral Shedding in Pediatric Patients Infected With Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2): Under the Surface	JAMA Pediatr / Editorial
27.08.2020	Misconceptions about weather and seasonality must not misguide COVID-19 response	Nat Commun / Comment

30.08.2020

[The global landscape of SARS-CoV-2 genomes, variants, and haplotypes in 2019nCoV](#)

bioRxiv (non-peer reviewed) / Article

Produced by the PHE COVID-19 Literature Digest Team

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