Public Health England

International EPI Cell Daily Evidence Digest – 03/08/2020

This Daily Evidence Digest is produced by the PHE COVID-19 Literature Digest Team as a resource for professionals working in public health. We do not accept responsibility for the availability, reliability or content of the items included in this resource and do not necessarily endorse the views expressed within them. The papers are organised under the following themes:

- Serology and immunology
- Epidemiology and clinical - risk factors
- Epidemiology and clinical - other
- Infection control
- 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Please note that we are including preprints (highlighted in red), which are preliminary reports of work that have NOT been peer-reviewed.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
30.07.2020	High Prevalence of Asymptomatic COVID-19 Infection in Hemodialysis Patients Detected Using Serologic Screening	J Am Soc Nephrol / Rapid Communication	• Authors investigate seroprevalence of COVID-19 antibodies in serum samples from 356 patients receiving in-centre haemodialysis for COVID-19 antibodies. • 121 had been symptomatic when screened before a dialysis session and received an RT-PCR test; 79 (22.2% of the total study population) tested positive for COVID-19. • 129 (36.2%) tested positive for COVID-19 antibodies; of these 52 (40.3%) had asymptomatic disease or undetected disease by PCR testing alone. Only two patients with PCR-confirmed infection did not seroconvert.

			• Serologic evidence of previous infection in asymptomatic or PCR-negative patients suggests that current diagnostic screening strategies may be limited in their ability to detect acute infection.
17.07.2020	The Impact of Mutations in SARS-CoV-2 Spike on Viral Infectivity and Antigenicity	Cell / Article	• Authors investigate 80 variants and 26 glycosylation site modifications for infectivity and reactivity to a panel of neutralizing antibodies and sera from convalescent patients. • D614G, plus variants containing D614G and another amino acid change, significantly more infectious. Most variants with amino acid change at receptor binding domain were less infectious, but variants including A475V, L452R, V483A, and F490L became resistant to some neutralizing antibodies. • Majority of glycosylation deletions were less infectious, whereas deletion of both N331 and N343 glycosylation drastically reduced infectivity, revealing the importance of glycosylation for viral infectivity. • N234Q markedly resistant to neutralizing antibodies; N165Q became more sensitive. Findings could be of value in development of vaccine and therapeutic antibodies.
30.07.2020	ChAdOx1 nCoV-19 vaccine prevents SARS-CoV-2 pneumonia in rhesus macaques	Nature / Article	• Vaccination with ChAdOx1 nCoV-19 (prime-only and prime-boost regimen) induced a balanced Th1/Th2 humoral and cellular immune response in rhesus macaques. • Authors observed a significantly reduced viral load in bronchoalveolar lavage fluid and lower respiratory tract tissue of vaccinated rhesus macaques challenged with COVID-19 compared with control animals, and no pneumonia was observed in vaccinated animals. • No difference in nasal shedding between vaccinated and control animals. No evidence of immune-enhanced disease following viral challenge in vaccinated animals was observed. • Safety, immunogenicity and efficacy of ChAdOx1 nCoV-19 against symptomatic PCR-positive COVID-19 disease will now be assessed in randomised controlled human clinical trials.
30.07.2020	Single-shot Ad26 vaccine protects against SARS-CoV-2 in rhesus macaques	Nature / Article	• Fifty-two rhesus macaques were immunized with Ad26 vectors encoding S variants or sham control and were challenged with COVID-19 by the intranasal and intratracheal routes. • The optimal Ad26 vaccine induced robust neutralizing antibody responses and provided complete or near-complete protection in bronchoalveolar lavage and nasal swabs following COVID-19

			challenge.
			• Vaccine-elicited neutralizing antibody titres correlated with protective efficacy, suggesting an immune correlate of protection. • These data demonstrate robust single-shot vaccine protection against COVID-19 in nonhuman primates. • The optimal Ad26 vector-based vaccine for COVID-19, termed Ad26.COV2.S, is currently being evaluated in clinical trials.

Epidemiology and clinical - risk factors

Publication Date	Title/URL	Journal/ Article type	Digest
01.08.2020	[Neurological Comorbidity Is a Predictor of Death in Covid-19 Disease: A Cohort Study on 576 Patients](#)	Front Neurol / Article	• Retrospective cohort study of 576 hospitalised COVID-19 patients (43.3% female, aged 67.2 years in mean) to research impact of chronic neurological disorders (CND) on prognosis • CND, defined as those neurological conditions causing permanent disability, present in 105 (18.3%) patients. Patients were older, more disabled, had more vascular risk factors and comorbidities and fewer clinical symptoms of Covid-19. T • Presence of CND was an independent predictor of death (HR 2.129, 95% CI: 1.382-3.280) but not a severer Covid-19 disease (OR: 1.75, 95% CI: 0.970-3.158). Frequency of laboratory abnormalities was similar, except for procalcitonin and INR.
31.07.2020	[Risk of severe COVID-19 disease with ACE inhibitors and angiotensin receptor blockers: cohort study including 8.3 million people](#)	Heart / Original Research	• Prospective cohort study using routinely collected data from 1205 general practices in England / 8.28 million participants aged 20-99 years to explore associations of angiotensive enzyme (ACE) inhibitor and angiotensin receptor blocker (ARB) drugs with COVID-19. • ACE inhibitors and ARBs associated with reduced risks of COVID-19 after adjusting for a wide range of variables. Neither associated with significantly increased risks of receiving ICU care. • Variations between ethnic groups raises possibility of ethnic-specific effects of ACE inhibitors/ARBs on COVID-19 disease susceptibility and severity which deserves further study.
30.07.2020	[Severe clinical outcomes of COVID-19 associated with proton pump inhibitors: a nationwide cohort study with propensity score matching](#)	Gut / Article	• Korean nationwide cohort study of potential associations of current use of proton pump inhibitors (PPIs) with infection rates of COVID-19 among 132,316 adult patients who underwent SARS-CoV-2 testing. • Among patients with confirmed COVID-19, the current use of PPIs

			conferred a 79% greater risk of severe clinical outcomes of COVID-19, while the relationship with the past use of PPIs remained insignificant. Current PPI use starting within the previous 30 days was associated with a 90% increased risk of severe clinical outcomes of COVID-19. • Patients taking PPIs are at increased risk for severe clinical outcomes of COVID-19 but not susceptible to COVID-19 infection.
30.07.2020	Risk stratification of patients admitted to hospital with covid-19 using the ISARIC WHO Clinical Characterisation Protocol: development and validation of the 4C Mortality Score	medRxiv (non-peer reviewed)	• Prospective observational cohort study to develop and validate a pragmatic risk score to predict mortality for patients admitted to hospital with covid-19 (4C Mortality Score) • Authors state that 4C Mortality Score outperformed existing scores, demonstrated utility to directly inform clinical decision making, and can be used to stratify inpatients with covid-19 into different management groups.
30.07.2020	Estrogen and COVID-19 symptoms: associations in women from the COVID Symptom Study	medRxiv (non-peer reviewed)	• A study using data from the COVID Symptom Study developed by Kings College London investigated links between COVID-19 rates and: 1) menopausal status; 2) combined oral contraceptive pill (COCP) use, and; 3) HRT use. • Post-menopausal women aged 40-60 years had a higher rate of predicted COVID-19 (P=0.003) and a corresponding range of symptoms, with consistent, but not significant trends observed for tested COVID-19 and disease severity. • Women aged 18-45 years taking combined oral contraceptive pill (COCP) had a significantly lower predicted COVID-19 (P=8.03E-05), with a reduction in hospital attendance (P=0.023). • Post-menopausal women using HRT or hormonal therapies did not exhibit consistent associations, including increased rates of predicted COVID-19 (P=2.22E-05) for HRT users alone.
31.07.2020	Risk of COVID-19 among front-line health-care workers and the general community: a prospective cohort study	The Lancet Public Health / Article	• In the UK and the USA, risk of reporting a positive test for COVID-19 was increased among front-line health-care workers. Health-care systems should ensure adequate availability of PPE and develop additional strategies to protect health-care workers from COVID-19, particularly those from Black, Asian, and minority ethnic backgrounds.
01.08.2020	COVID-19 related mortality and spread of disease in long-term care: a living systematic review of emerging evidence	medRxiv (non-peer reviewed)	• A living systematic review synthesised early international evidence on mortality rates and incidence of COVID-19 among people who use and provide long-term care (LTC). • 54 study reports for 49 unique primary studies or outbreak reports were included. • Outbreak investigations in LTC facilities found COVID-19 incidence

rates of between 0.0% and 71.7% among residents and between 0.4% and 64.0% among staff at affected facilities.
• Mortality rates varied from 0.0% to 17.1% of all residents at outbreak facilities, with case fatality rates between 0.0% and 33.7%.
• In included studies of outbreaks, no LTC staff members had died. Studies of wider LTC populations found that between 0.4% and 40.8% of users, and between 4.0% and 23.8% of staff were infected, although generalisability is limited.
• There was limited information on the impact of COVID-19 on LTC in the community.

Epidemiology and clinical – other

Publication Date	Title/URL	Journal/ Article type	Digest
16.04.2020	[What does RCGP surveillance tell us about COVID-19 in the community?](#)	CEBM / Viewpoint	• Previously published in April, article updated in July to include recent data. • The current community transmission of COVID is low and not at epidemic levels. The rates are less than that of confirmed cases in the UK. • This could be explained by asymptomatic people or those with mild infections not seeking out testing in primary care. • The observed reductions in URTIs and LRTIs suggest that most of the effect on rates of transmission occurred through the encouragement of social distancing.
30.07.2020	[Improving COVID-19 critical care mortality over time in England: A national cohort study, March to June 2020](#)	medRxiv (non-peer reviewed)	• Data from the COVID-19 Hospitalisation in England Surveillance System (CHESS) up to the 29th June 2020 (n=14,958) was used to determine the trend in mortality risk over time in people with severe COVID-19 requiring critical care. • Data indicated a substantial mortality improvement in people admitted to critical care with COVID-19 in England, with markedly lower mortality in people admitted in mid-April and May compared to earlier in the pandemic. • This trend remains after adjustment for patient demographics and comorbidities suggesting this improvement is not due to changing patient characteristics.

			• Possible causes include the introduction of effective treatments as part of clinical trials and a falling critical care burden.
31.07.2020	Persistent self-reported changes in hearing and tinnitus in post-hospitalisation COVID-19 cases	Int J Audiol / Research letter	• A review of 121 recovering adult COVID-19 patients 8 weeks after discharge from hospital in Manchester found that more than 1 in 10 report a change in their hearing status

Infection control

Publication Date	Title/URL	Journal/ Article type	Digest
30.07.2020	A prospective study to identify rates of SARS-CoV-2 virus in the peritoneum and lower genital tract of patients having surgery	medRxiv (non-peer reviewed)	• A prospective cross sectional observational study investigated presence of COVID-19 virus in the abdominal fluid and lower genital tract of 113 patients undergoing surgery • Findings indicate the presence of COVID-19 RNA in the abdominal fluid or lower genital tract of presumed negative patients is nil or extremely low. • These data may inform surgeons of the risks of restarting laparoscopic surgery at a time when COVID19 is endemic in the population.
28.07.2020	Increased risk of SARS-CoV-2 infection in staff working across different care homes enhanced COVID-19 outbreak investigations in London care homes	J Infect / Article	• 20% of 250 staff working in 6 care homes with a COVID-19 outbreak were COVID-19 positive • COVID-19 positivity was similar (15-17%) in staff with regular, occasional or no resident contact • COVID-19 positivity was 4-fold higher in staff working across different care homes • Whole genome sequencing identified distinct clusters involving staff only

Modelling

Publication Date	Title/URL	Journal/ Article type	Digest
31.07.2020	Assessment of SARS-CoV-2 Screening Strategies to Permit the Safe Reopening of College Campuses in the United States	JAMA Network Open / Original investigation	• This analytic modelling study of a hypothetical cohort of 4990 college-age students without COVID-19 infection and 10 students with undetected asymptomatic cases of COVID-19 infection suggested that frequent screening (every 2 days) of all students with a low-sensitivity,

			high-specificity test might be required to control outbreaks with manageable isolation dormitory utilization at a justifiable cost. • Symptom-based screening alone was not sufficient to contain an outbreak, and the safe reopening of campuses in fall 2020 may require screening every 2 days, uncompromising vigilance, and good prevention practices.
01.08.2020	[Effects of human mobility restrictions on the spread of COVID-19 in Shenzhen, China: a modelling study using mobile phone data](#)	The Lancet Digital Health / Article	• In the authors basic scenario (R0 of 2·68), mobility reduction of 20–60% within the city had a notable effect on controlling COVID-19 spread: a flattening of the peak number of cases by 33% (95% UI 21–42) and delay to the peak number by 2 weeks with a 20% restriction, 66% (48–75) reduction and 4 week delay with a 40% restriction, and 91% (79–95) reduction and 14 week delay with a 60% restriction. • The model could help policy makers to establish the optimal combinations of mobility restrictions during the COVID-19 pandemic, especially to assess the potential positive effects of mobility restriction on public health in view of the potential negative economic and societal effects.

Overviews, comments and editorials

Publication Date	Title/URL	Journal/ Article type
30.07.2020	[NICE public health guidance update](#)	J Public Health (Oxf) / Article
31.07.2020	[Taking responsibility for front-line health-care workers](#)	The Lancet Public Health / Comment
31.07.2020	[B-cell depletion with rituximab in the COVID-19 pandemic: where do we stand?](#)	The Lancet Rheumatology / Correspondence

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