



COVID-19 Literature Digest – 14/09/2020

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
- Diagnostics
- Genomics
- Epidemiology and clinical - children and pregnancy
- Epidemiology and clinical - risk factors
- Epidemiology and clinical - other
- Infection control
- Modelling
- Guidance, consensus statements and hospital resources (no digest)
- 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Please note that we are including preprints (**highlighted in red**), which are preliminary reports of work that have NOT been peer-reviewed.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 |
|------------------|---|---------------------------|--|
| 12.09.2020 | Infectious Diseases Society of America Guidelines on the Diagnosis of COVID-19: Serologic Testing | Clin Infect Dis / Article | <ul style="list-style-type: none">• The Infectious Diseases Society of America (IDSA) convened an expert panel to perform a systematic review of COVID-19 serology literature and construct best practice guidance related to SARS-CoV-2 serologic testing.• The panel agreed on eight diagnostic recommendations.• The panel identified three potential indications for serologic testing |

including: 1) evaluation of patients with a high clinical suspicion for COVID-19 when molecular diagnostic testing is negative and at least two weeks have passed since symptom onset; 2) assessment of multisystem inflammatory syndrome in children; and 3) for conducting serosurveillance studies.

Diagnostics

| Publication Date | Title / URL | Journal / Article type | Digest |
|------------------|---|------------------------------------|--|
| 11.09.2020 | Saliva Alternative to Upper Respiratory Swabs for SARS-CoV-2 Diagnosis | Emerg Infect Dis / Research letter | <ul style="list-style-type: none"> • PCR of upper respiratory specimens is the diagnostic standard for SARS CoV-2 infection. However, saliva sampling is an easy alternative to nasal and throat swabbing. • The authors found similar viral loads in saliva samples and in nasal and throat swab samples from 110 patients with coronavirus disease. |
| 09.09.2020 | Sample pooling for SARS-COV-2 RT-PCR screening | Clin Microbiol Infect / Article | <ul style="list-style-type: none"> • A total of 3519 nasopharyngeal samples received at 9 Spanish clinical microbiology laboratories were processed individually and in pools (342 pools of 10 samples and 11 pools of 9 samples). • 253 pools (2519 samples) were negative, and 99 pools (990 samples) were positive; with 241 positive samples (6.85%), the pooling strategy would have saved 2167 PCR tests. • Show a high efficiency of pooling strategies for SARS-CoV-2 RNA testing, across different RNA extraction and amplification platforms, with excellent performance in terms of sensitivity, specificity, and positive and negative predictive values. |
| 11.09.2020 | Cardiovascular Magnetic Resonance Findings in Competitive Athletes Recovering From COVID-19 Infection | JAMA Cardiol / Research Letter | <ul style="list-style-type: none"> • An investigation of the use of cardiac magnetic resonance (CMR) imaging in competitive athletes (n=26; mean [SD] age, 19.5 [1.5] years; 15 male) recovered from COVID-19 to detect myocardial inflammation that would identify high-risk athletes. • Of 26 competitive athletes, 4 (15%) had CMR findings suggestive of myocarditis and 8 additional athletes (30.8%) exhibited LGE without T2 elevation suggestive of prior myocardial injury. COVID-19–related myocardial injury in competitive athletes and sports participation remains unclear. • While long-term follow-up and large studies including control populations are required to understand CMR changes in competitive athletes, CMR may provide an excellent risk-stratification assessment for |

myocarditis in athletes who have recovered from COVID-19 to guide safe competitive sports participation.

Genomics

| Publication Date | Title / URL | Journal / Article type | Digest |
|------------------|---|---------------------------------------|--|
| 10.09.2020 | Cryptic transmission of SARS-CoV-2 in Washington state | Science / Report | <ul style="list-style-type: none"> The authors analysed 453 SARS-CoV-2 genomes collected between 20 Feb and 15 Mar 2020 from infected patients in Washington State, USA. Most SARS-CoV-2 infections sampled during this time appear to derive from a single introduction in late Jan or early Feb 2020 which subsequently spread locally before active community surveillance was implemented. |
| 10.09.2020 | Racial/Ethnic Variation in Nasal Gene Expression of Transmembrane Serine Protease 2 (TMPRSS2) | JAMA / Research letter | <ul style="list-style-type: none"> This study of nasal epithelial gene expression in a racially/ethnically diverse cohort showed significantly higher expression of TMPRSS2 in Black individuals compared with other self-identified races/ethnicities. Authors conclude that given the essential role of TMPRSS2 in SARS-CoV-2 entry, higher nasal expression of TMPRSS2 may contribute to the higher burden of COVID-19 among Black individuals. |
| 13.09.2020 | Age-dependent regulation of SARS-CoV-2 cell entry genes and cell death programs correlates with COVID-19 disease severity | bioRxiv (non-peer reviewed) / Article | <ul style="list-style-type: none"> The authors demonstrate that ACE2 transcripts are expressed in the lung and trachea shortly after birth, downregulated during childhood, and again expressed at high levels in late adulthood. Overall the authors identify strong and distinct correlates of COVID-19 disease severity across lifespan and advance our understanding of the regulation of ACE2 and cell death programs in the mammalian lung. |

Epidemiology and clinical – children and pregnancy

| Publication Date | Title / URL | Journal / Article type | Digest |
|------------------|---|--------------------------------|---|
| 11.09.2020 | PHE: SARS-CoV2 susceptibility and transmission risk in children: an overview of current evidence from PHE surveillance work, 19 August 2020 | Gov.uk / Research and analysis | <ul style="list-style-type: none"> This paper summarises evidence on what is known about susceptibility to infection and transmission dynamics in children. It briefly references evidence from the international literature but draws primarily on information from a range of surveillance systems and studies initiated by PHE since the beginning of the COVID-19 pandemic. |

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| | | | <ul style="list-style-type: none"> • The focus of the paper is on implications of findings for educational settings in England. |
| 11.09.2020 | Transmission Dynamics of COVID-19 Outbreaks Associated with Child Care Facilities — Salt Lake City, Utah, April–July 2020 | MMWR Morb Mortal Wkly Rep / Report | <ul style="list-style-type: none"> • Contact tracing data were collected from three COVID-19 outbreaks in child care facilities in Salt Lake County, Utah, during April 1–July 10, 2020, and were retrospectively reviewed to explore attack rates and transmission patterns. • Twelve children acquired COVID-19 in child care facilities. • Transmission was documented from these children to at least 12 (26%) of 46 non-facility contacts (confirmed or probable cases). One parent was hospitalized. Transmission was observed from two of three children with confirmed, asymptomatic COVID-19. • SARS-CoV-2 Infections among young children acquired in child care settings were transmitted to their household members. Testing of contacts of laboratory-confirmed COVID-19 cases in child care settings, including children who might not have symptoms, could improve control of transmission from child care attendees to family members. |

Epidemiology and clinical – risk factors

| Publication Date | Title / URL | Journal / Article type | Digest |
|------------------|---|--|---|
| 10.09.2020 | Rapid Risk Assessment: Coronavirus disease 2019 (COVID-19) in the EU/EEA and the UK – eleventh update: resurgence of cases | European Centre for Disease Prevention and Control / Risk assessment | <ul style="list-style-type: none"> • In this update, the authors analyse the risk of further escalation of COVID-19 in the countries that have reported a recent increase in COVID-19 cases and the risk of further escalation of COVID-19 across all EU/EEA countries and the UK. |
| 11.09.2020 | Prevalence of Underlying Medical Conditions Among Selected Essential Critical Infrastructure Workers - Behavioral Risk Factor Surveillance System, 31 States, 2017-2018 | MMWR Morb Mortal Wkly Rep / Report | <ul style="list-style-type: none"> • To assess the baseline prevalence of underlying conditions among workers in six essential occupations and seven essential industries, CDC analysed data from the 2017 and 2018 Behavioural Risk Factor Surveillance System (BRFSS) surveys, the most recent data available. This report presents unadjusted prevalence and adjusted prevalence ratios (aPRs) for selected underlying conditions. • High prevalence of underlying medical conditions increase risks for severe COVID-19 illness among home health aides, other health care support workers, and nursing home, trucking, and transit industry workers. |
| 11.09.2020 | Community and Close Contact Exposures Associated with COVID-19 Among Symptomatic | MMWR Morb Mortal Wkly Rep / Report | <ul style="list-style-type: none"> • Findings from a case-control investigation of symptomatic outpatients from 11 U.S. health care facilities found that close contact with persons |

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| | Adults >=18 Years in 11 Outpatient Health Care Facilities - United States, July 2020 | | with known COVID-19 or going to locations that offer on-site eating and drinking options were associated with COVID-19 positivity. <ul style="list-style-type: none"> • Adults with positive SARS-CoV-2 test results were approximately twice as likely to have reported dining at a restaurant than were those with negative SARS-CoV-2 test results. |
| 11.09.2020 | SARS-CoV-2 seroprevalence and asymptomatic viral carriage in healthcare workers: a cross-sectional study | Thorax / Article | <ul style="list-style-type: none"> • 545 asymptomatic healthcare workers were recruited while at work (University Hospitals Birmingham NHS Foundation Trust). • The point prevalence of SARS-CoV-2 viral carriage was 2.4% (n=13/545). The overall seroprevalence of SARS-CoV-2 antibodies was 24.4% (n=126/516). • Identified differences in the occupational risk of exposure to SARS-CoV-2 between hospital departments and confirm asymptomatic seroconversion occurs in healthcare workers. Further investigation of these observations is required to inform future infection control and occupational health practices. |

Epidemiology and clinical – other

| Publication Date | Title / URL | Journal / Article type | Digest |
|------------------|---|----------------------------------|---|
| 11.09.2020 | Early Insights from Statistical and Mathematical Modeling of Key Epidemiologic Parameters of COVID-19 | Emerg Infect Dis / Online report | <ul style="list-style-type: none"> • Report key epidemiologic parameter estimates for coronavirus disease identified in peer-reviewed publications, preprint articles, and online reports. • Range estimates for incubation period were 1.8–6.9 days, serial interval 4.0–7.5 days, and doubling time 2.3–7.4 days. • The effective reproductive number varied widely, with reductions attributable to interventions. • Case burden and infection fatality ratios increased with patient age. Implementation of combined interventions could reduce cases and delay epidemic peak up to 1 month. • These parameters for transmission, disease severity, and intervention effectiveness are critical for guiding policy decisions. Estimates will likely change as new information becomes available. |
| 11.09.2020 | Dynamic CO-CIN report to SAGE and NERVTAG, 26 August 2020 | Gov.uk / Research and analysis | <ul style="list-style-type: none"> • The COVID-19 Clinical Information Network (CO-CIN) collate clinical information from the health care records of people of all ages admitted to hospital in the UK. • This paper provides the information and evidence about COVID-19 for |

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| | | | <p>a large sample of hospitalised UK patients.</p> <ul style="list-style-type: none"> • The dataset is increasingly more representative of the burden of disease requiring hospitalisation and captures the early exponential rise of disease incidence that is now increasingly driven by domestic transmission events in the community. • The commonest comorbidity is chronic cardiac disease, reflecting patterns seen in other countries, although nearly a quarter of patients admitted do not have underlying comorbid disease. |
| 11.09.2020 | Resurgence of SARS-CoV-2 in England: detection by community antigen surveillance | medRxiv (non-peer reviewed) / Article | <ul style="list-style-type: none"> • The authors report results from 594,000 swabs tested for SARS-CoV-2 obtained from a representative sample of people in England over four rounds collected regardless of symptoms, starting in May 2020 and finishing on 7 Sep. • Over all four rounds of the study, they found that 72% (67%, 76%) of swab-positive individuals were asymptomatic at the time of swab and in the week prior. The epidemic declined between rounds 1 and 2, and rounds 2 and 3. However, the epidemic was increasing between rounds 3 and 4, with a doubling time of 17 (13, 23) days corresponding to an R value of 1.3 (1.2, 1.4). • Although low levels of transmission persisted in England through to mid-summer 2020, the prevalence of SARS-CoV-2 is now increasing. They found evidence of accelerating transmission at the end of August and beginning of September. |
| 10.09.2020 | The emergence of SARS-CoV-2 in Europe and North America | Science / Article | <ul style="list-style-type: none"> • The authors elucidate when, where and how the earliest sustained SARS-CoV-2 transmission networks became established in Europe and North America. • Results suggest that rapid early interventions successfully prevented early introductions of the virus into Germany and the US from taking hold. Other, later introductions of the virus from China to both Italy and to Washington State founded the earliest sustained European and North America transmission networks. • Analyses demonstrate the effectiveness of public health measures in preventing onward transmission and show that intensive testing and contact tracing could have prevented SARS-CoV-2 from becoming established. |

Infection control

| Publication Date | Title / URL | Journal / Article type | Digest |
|------------------|--|---------------------------------|---|
| 09.09.2020 | Detection and infectivity potential of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) environmental contamination in isolation units and quarantine facilities | Clin Microbiol Infect / Article | <ul style="list-style-type: none"> • SARS-CoV-2 virus stability and infectivity on non-porous surfaces was tested under controlled laboratory conditions. In addition, surfaces and air sampling was conducted at two COVID-19 hospital isolation units and in a quarantine hotel for asymptomatic and very mild COVID-19 patients. • In laboratory-controlled conditions, SARS-CoV-2 gradually lost its infectivity completely at day 4 at ambient temperature and the decay rate of viral viability on surfaces directly correlated with increase in temperature. • Viral RNA was detected in 29/55 (52.7%) and 16/42 (38%) surface samples from the surrounding of symptomatic COVID-19 patients two hospital isolation units and in a quarantine hotel. • None of the surface and air samples from all three sites (0/97) were found to contain infectious titres SARS-Cov-2 in tissue culture assay. |

Modelling

| Publication Date | Title / URL | Journal / Article type | Digest |
|------------------|--|---------------------------------------|---|
| 10.09.2020 | High COVID-19 transmission potential associated with re-opening universities can be mitigated with layered interventions | medRxiv (non-peer reviewed) / Article | <ul style="list-style-type: none"> • A stochastic transmission model based on realistic mixing patterns between students predicts that if asymptomatic cases are half as infectious as symptomatic cases then 20% (14% - 26%) of students could be infected during the first term, rising to 94% (93% - 94%) if asymptomatic and symptomatic cases are equally infectious. • First year students are predicted to be the main drivers of transmission due to high numbers of contacts in communal residences. • Supplementing reduced face-to-face testing with COVID-secure interactions and reduced living circles could reduce the percentage of infected students by 75%. • Mass testing of students would need to occur at least fortnightly, is not the most effective option considered, and comes at a cost of high numbers of students requiring self-isolation. |

Guidance and consensus statements

| Publication Date | Title / URL | Journal / Article type |
|------------------|---|--------------------------------|
| 11.09.2020 | SPI-B: Consensus statement on the reopening of large events and venues, 19 August 2020 | Gov.uk / Research and analysis |
| 11.09.2020 | SPI-B: Extended paper on behavioural evidence on the reopening of large events and venues, 21 August 2020 | Gov.uk / Research and analysis |
| 11.09.2020 | SPI-M-O: Consensus statement on events and gatherings, 19 August 2020 | Gov.uk / Research and analysis |
| 11.09.2020 | TFMS: Behavioural paper supporting the consensus statement on mass testing, 27 August 2020 | Gov.uk / Research and analysis |

Overviews, comments and editorials

| Publication Date | Title / URL | Journal / Article type |
|------------------|---|---|
| 11.09.2020 | SARS-CoV-2 transmission via speech-generated respiratory droplets | Lancet Infectious Diseases / Correspondence |
| 10.09.2020 | Curing COVID-19 | Lancet Infectious Diseases / Editorial |
| 11.09.2020 | COVID-19 and the Path to Immunity | JAMA / Viewpoint |
| 11.09.2020 | Every Body Counts: Measuring Mortality From the COVID-19 Pandemic | Ann Intern Med / Article |

Produced by the PHE COVID-19 Literature Digest Team

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