

COVID-19 Resource Desk

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New Research

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COVID-19 related publications by Providence caregivers – see [Digital Commons](#)

Clinical Syndrome

- 1. Cerebrovascular disease in patients with COVID-19: neuroimaging, histological and clinical description.** Hernández-Fernández F, Valencia HS, Barbella-Aponte RA, et al. *Brain*. 2020 Jul 9:awaa239. doi: 10.1093/brain/awaa239. <https://academic.oup.com/brain/article/doi/10.1093/brain/awaa239/5869424>
Findings: In our centre, there were 1683 admissions of patients with COVID-19, of which 23 (1.4%) developed cerebrovascular disease. Seventeen patients were classified as cerebral ischaemia (73.9%, with two arterial dissections), five as intracerebral haemorrhage (21.7%), and one leukoencephalopathy of posterior reversible encephalopathy type. Haemorrhagic patients had higher ferritin levels at the time of stroke (1554.3 versus 519.2, $P = 0.004$). Ischaemic strokes were unexpectedly frequent in the vertebrobasilar territory (6/17, 35.3%). In the haemorrhagic group, a characteristic radiological pattern was identified showing subarachnoid haemorrhage, parieto-occipital leukoencephalopathy, microbleeds and single or multiple focal haematomas. Brain biopsies performed showed signs of thrombotic microangiopathy and endothelial injury, with no evidence of vasculitis or necrotizing encephalitis. Our series shows cerebrovascular disease incidence of 1.4% in patients with COVID-19 with high morbidity and mortality. We describe pathological and radiological data consistent with thrombotic microangiopathy caused by endotheliopathy with a haemorrhagic predisposition.
- 2. Augmented curation of clinical notes from a massive EHR system reveals symptoms of impending COVID-19 diagnosis.** Wagner T, Shweta F, Murugadoss K, et al. *Elife*. 2020 Jul 7;9:e58227. doi: 10.7554/eLife.58227. <https://elifesciences.org/articles/58227>
Findings: Understanding temporal dynamics of COVID-19 patient symptoms could provide fine-grained resolution to guide clinical decision-making. Here, we use deep neural networks over an institution-wide platform for the augmented curation of clinical notes from 77,167 patients subjected to COVID-19 PCR testing. By contrasting Electronic Health Record (EHR)-derived symptoms of COVID-19-positive (COVIDpos; $n=2,317$) versus COVID-19-negative (COVIDneg; $n=74,850$) patients for the week preceding the PCR testing date, we identify anosmia/dysgeusia (27.1-fold), fever/chills (2.6-fold), respiratory difficulty (2.2-fold), cough (2.2-fold), myalgia/arthralgia (2-fold), and diarrhea (1.4-fold) as significantly amplified in COVIDpos over COVIDneg patients. The combination of cough and fever/chills has 4.2-fold amplification in

COVIDpos patients during the week prior to PCR testing, and along with anosmia/dysgeusia, constitutes the earliest EHR-derived signature of COVID-19. This study introduces an Augmented Intelligence platform for the real-time synthesis of institutional biomedical knowledge. The platform holds tremendous potential for scaling up curation throughput, thus enabling EHR-powered early disease diagnosis.

- 3. Incidence of Deep Vein Thrombosis among non-ICU Patients Hospitalized for COVID-19 despite Pharmacological Thromboprophylaxis.** Santoliquido A, Porfidia A, Nesci A, et al. *J Thromb Haemost.* 2020 Jul 6. doi: 10.1111/jth.14992. <https://onlinelibrary.wiley.com/doi/10.1111/jth.14992>

Findings: The population that we screened consisted of 84 consecutive patients, with a mean age of 67.6±13.5 years and a mean Padua Prediction Score of 5.1±1.6. Seventy-two patients (85.7%) had respiratory insufficiency, required oxygen supplementation, and had reduced mobility or were bedridden. In this cohort, we found 10 cases of DVT, with an incidence of 11.9%. Of these, 2 were proximal DVT and 8 were distal DVT. Significant differences between subjects with and without DVT were D-dimer >3,000 µg/L (P<0.05), current or previous cancer (P<0.05), and need of high flow nasal oxygen therapy and/or non-invasive ventilation (P<0.01). DVT may occur among non-ICU patients hospitalized for COVID-19, despite guideline-recommended thromboprophylaxis.

- 4. Marked T cell activation, senescence, exhaustion and skewing towards TH17 in patients with COVID-19 pneumonia.** De Biasi S, Meschiari M, Gibellini L, et al. *Nat Commun.* 2020 Jul 6;11(1):3434. doi: 10.1038/s41467-020-17292-4. <https://www.nature.com/articles/s41467-020-17292-4>

Findings: Here we show that, compared with healthy controls, COVID-19 patients' T cell compartment displays several alterations involving naïve, central memory, effector memory and terminally differentiated cells, as well as regulatory T cells and PD1+CD57+ exhausted T cells. Significant alterations exist also in several lineage-specifying transcription factors and chemokine receptors. Terminally differentiated T cells from patients proliferate less than those from healthy controls, whereas their mitochondria functionality is similar in CD4+ T cells from both groups. Patients display significant increases of proinflammatory or anti-inflammatory cytokines, including T helper type-1 and type-2 cytokines, chemokines and galectins; their lymphocytes produce more tumor necrosis factor (TNF), interferon-γ, interleukin (IL)-2 and IL-17, with the last observation implying that blocking IL-17 could provide a novel therapeutic strategy for COVID-19.

- 5. COVID-19 associated Kawasaki-like multisystem inflammatory disease in an adult.** Sokolovsky S, Soni P, Hoffman T, et al. *Am J Emerg Med.* 2020 Jun 25:S0735-6757(20)30542-8. doi: 10.1016/j.ajem.2020.06.053. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7315983/>

Findings: Here, we report the case of a 36-year-old woman who presented to the emergency department hypotensive and tachycardic after 1 week of fevers, abdominal pain, vomiting and diarrhea, and was found to have the classic phenotype of complete Kawasaki's Disease including nonexudative conjunctivitis, cracked lips, edema of the hands and feet, palmar erythema, a diffuse maculopapular rash, and cervical lymphadenopathy. Initial laboratory

studies were significant for hyponatremia, elevated liver function tests including direct hyperbilirubinemia, and leukocytosis with neutrophilia. Imaging revealed mild gallbladder wall edema, a small area of colitis, and small pleural effusion. She was treated for Kawasaki Disease Shock Syndrome (KDSS) with pulse dose solumedrol, IVIG, and aspirin with near resolution of symptoms and normalization of vital signs within 1 day and subsequent improvement in her laboratory abnormalities. She was later found to be COVID-19 IgG positive, suggesting past exposure. This case represents an early report of a KD-like illness in an adult with serologic evidence of a previous COVID-19 infection, similar to MIS-C. It suggests that the virulent strain of SARS-CoV-2 appears to cause a post-infectious inflammatory syndrome similar to KD in adults, as well as children.

See ALSO: **An adult with Kawasaki-like multisystem inflammatory syndrome associated with COVID-19.** Shaigany S et al. *Lancet* 2020 Jul 10. doi: [https://doi.org/10.1016/S0140-6736\(20\)31526-9](https://doi.org/10.1016/S0140-6736(20)31526-9)
[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)31526-9/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31526-9/fulltext)

6. **The emerging spectrum of COVID-19 neurology: clinical, radiological and laboratory findings.**

Paterson RW, Brown RL, Benjamin L, et al. *Brain*. July 8, 2020

<https://doi.org/10.1093/brain/awaa240>

<https://academic.oup.com/brain/article/doi/10.1093/brain/awaa240/5868408>

Findings: The high incidence of acute disseminated encephalomyelitis, particularly with haemorrhagic change, is striking. This complication was not related to the severity of the respiratory COVID-19 disease. Early recognition, investigation and management of COVID-19-related neurological disease is challenging. Further clinical, neuroradiological, biomarker and neuropathological studies are essential to determine the underlying pathobiological mechanisms, which will guide treatment. Longitudinal follow-up studies will be necessary to ascertain the long-term neurological and neuropsychological consequences of this pandemic.

7. **Liver injury is independently associated with adverse clinical outcomes in patients with COVID-19.** Yip TC, Lui GC, Wong VW, et al. *Gut*. 2020 Jul 8:gutjnl-2020-321726. doi:

10.1136/gutjnl-2020-321726. <https://gut.bmj.com/content/early/2020/07/08/gutjnl-2020-321726>

Findings: We identified 1040 COVID-19 patients (mean age 38 years, 54% men), 1670 SARS patients (mean age 44 years, 44% men) and 675 other HCoV patients (mean age 20 years, 57% men). ALT/AST elevation occurred in 50.3% SARS patients, 22.5% COVID-19 patients and 36.0% other HCoV patients. For COVID-19 patients, 53 (5.1%) were admitted to ICU, 22 (2.1%) received invasive mechanical ventilation and 4 (0.4%) died. ALT/AST elevation was independently associated with primary end point after adjusted for albumin, diabetes and hypertension. Use of lopinavir-ritonavir ± ribavirin + interferon beta and corticosteroids was independently associated with ALT/AST elevation. ALT/AST elevation was common and independently associated with adverse clinical outcomes in COVID-19 patients. Use of lopinavir-ritonavir, with or without ribavirin, interferon beta and/or corticosteroids was independently associated with ALT/AST elevation.

8. **Characteristics and Outcomes in Patients with COVID-19 and Acute Ischemic Stroke: The Global COVID-19 Stroke Registry.** Ntaios G et al. *Stroke* 2020 Jul 9. doi: <https://doi.org/10.1161/STROKEAHA.120.031208>
<https://www.ahajournals.org/doi/10.1161/STROKEAHA.120.031208>
Findings: We pooled all consecutive patients hospitalized with laboratory-confirmed COVID-19 and acute ischemic stroke in 28 sites from 16 countries. Between January 27, 2020, and May 19, 2020, 174 patients (median age 71.2 years; 37.9% females) with COVID-19 and acute ischemic stroke were hospitalized. The median National Institute of Health Stroke Scale was 10 (interquartile range [IQR], 4–18). In the 1:1 matched sample of 336 patients with COVID-19 and non-COVID-19, the median National Institute of Health Stroke Scale was higher in patients with COVID-19 (10 [IQR, 4–18] versus 6 [IQR, 3–14]), $P=0.03$; (odds ratio, 1.69 [95% CI, 1.08–2.65] for higher National Institute of Health Stroke Scale score). There were 48 (27.6%) deaths, of which 22 were attributed to COVID-19 and 26 to stroke. Among 96 survivors with available information about disability status, 49 (51%) had severe disability at discharge. In the propensity score-matched population ($n=330$), patients with COVID-19 had higher risk for severe disability (median mRS 4 [IQR, 2–6] versus 2 [IQR, 1–4], $P<0.001$) and death (odds ratio, 4.3 [95% CI, 2.22–8.30]) compared with patients without COVID-19. Our findings suggest that COVID-19 associated ischemic strokes are more severe with worse functional outcome and higher mortality than non-COVID-19 ischemic strokes.
9. **Asthma prevalence in patients with SARS-CoV-2 infection detected by RT-PCR not requiring hospitalization.** Garcia-Pachon E, Zamora-Molina L, Soler-Sempere MJ, et al. *Respir Med*. 2020 Jul 4;171:106084. doi: 10.1016/j.rmed.2020.106084.
<https://www.sciencedirect.com/science/article/pii/S0954611120302249>
Findings: The prevalence in SARS-infected patients not requiring hospitalization is not known. In our study a total of 218 patients (58% of those who tested positive) did not require hospitalization; they had a median age of 45 years and 57% were female. Six patients (2.8%) had a previous diagnosis of asthma. Only one patient developed a mild aggravation of asthma symptoms associated with SARS-CoV-2 infection. Few patients with asthma were infected by SARS-CoV-2, and this infection was not a significant cause of asthma exacerbation.
10. **Pulmonary embolism in COVID-19 patients: a French multicentre cohort study.** Fauvel C, Weizman O, Trimaille A, et al. *Eur Heart J*. 2020 Jul 13;ehaa500. doi: 10.1093/eurheartj/ehaa500.
<https://academic.oup.com/eurheartj/article/doi/10.1093/eurheartj/ehaa500/5870571>
Findings: PE risk factors in the COVID-19 context do not include traditional thrombo-embolic risk factors but rather independent clinical and biological findings at admission, including a major contribution to inflammation. In a multivariable analysis, the following variables were associated with PE: male gender, anticoagulation with a prophylactic dose or a therapeutic dose, C-reactive protein, and time from symptom onset to hospitalization.

Diagnosics & Screening

- 11. Optimising benefits of testing key workers for infection with SARS-CoV-2: A mathematical modelling analysis.** Sandmann FG, White PJ, Ramsay M, Jit M. *Clin Infect Dis*. 2020 Jul 8:ciaa901. doi: 10.1093/cid/ciaa901.
<https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa901/5868532>
Findings: Testing all staff changes the risk of workplace transmission by -56.9 to +1.0 workers per 1,000 tests, and absences by 0.5 to +3.6 days per test but at heightened testing needs of 989.6-1995.9 tests per 1,000 workers. Testing workers in household-quarantine reduces absences the most by 3.0-6.9 days per test (at 47.0-210.4 tests per 1,000 workers), while increasing risk of workplace transmission by 0.02-49.5 infected workers per 1,000 tests (which can be minimised when re-testing initially-negative tests). Based on optimising absence durations or transmission risk our modelling suggests testing staff in household-quarantine or all staff, depending on infection levels and testing capacities.
- 12. Signs and symptoms to determine if a patient presenting in primary care or hospital outpatient settings has COVID-19 disease.** Struyf T, Deeks JJ, Dinnes J, et al. *Cochrane Database Syst Rev*. 2020 Jul 7;7:CD013665. doi: 10.1002/14651858.CD013665.
<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013665/full>
Findings: The individual signs and symptoms included in this review appear to have very poor diagnostic properties, although this should be interpreted in the context of selection bias and heterogeneity between studies. Based on currently available data, neither absence nor presence of signs or symptoms are accurate enough to rule in or rule out disease. Prospective studies in an unselected population presenting to primary care or hospital outpatient settings, examining combinations of signs and symptoms to evaluate the syndromic presentation of COVID-19 disease, are urgently needed. Results from such studies could inform subsequent management decisions such as self-isolation or selecting patients for further diagnostic testing. We also need data on potentially more specific symptoms such as loss of sense of smell. Studies in older adults are especially important.
- 13. Seroprevalence of antibodies against SARS-CoV-2 among health care workers in a large Spanish reference hospital.** Garcia-Basteiro AL, Moncunill G, Tortajada M, et al. *Nat Commun*. 2020 Jul 8;11(1):3500. doi: 10.1038/s41467-020-17318-x.
<https://www.nature.com/articles/s41467-020-17318-x>
Findings: Of the 578 participants recruited from 28 March to 9 April 2020, 54 (9.3%) were seropositive for IgM and/or IgG and/or IgA against SARS-CoV-2. The cumulative prevalence of SARS-CoV-2 infection (presence of antibodies or past or current positive rRT-PCR) was 11.2%. Among those with evidence of past or current infection, 40.0% (26/65) had not been previously diagnosed with COVID-19. Here we report a relatively low seroprevalence of antibodies among HCW at the peak of the COVID-19 epidemic in Spain. A large proportion of HCW with past or present infection had not been previously diagnosed with COVID-19, which calls for active periodic rRT-PCR testing in hospital settings.
- 14. Commercial SARS-CoV-2 Molecular Assays: Superior Analytical Sensitivity of cobas SARS-CoV-2 Relative to NxTAG Cov Extended Panel and ID NOW COVID-19 Test.** Jin R, Pettengill MA,

Hartnett NL, et al. *Arch Pathol Lab Med*. 2020 Jul 10. doi: 10.5858/arpa.2020-0283-SA.
<https://www.archivesofpathology.org/doi/abs/10.5858/arpa.2020-0283-SA>

Findings: To compare the analytical sensitivity of three commercial SARS-CoV-2 molecular assays, selected samples were studied in parallel with Cobas SARS-CoV-2 test, NxTAG CoV Extended Panel, and ID NOW COVID-19 assays. Ct values of cobas SARS-CoV-2 positive samples were evenly distributed over ranges of 13.32-39.50 (mean: 25.06) and 13.60-42.49 (mean: 26.45) for ORF1 and E gene targets, respectively. NxTAG only reliably detected specimens with E gene Ct values lower than 33, and is estimated to detect 89.4% of positive specimens detected by cobas assay. ID NOW had performance variation independent of Ct value and is estimated to detect 83.5% of cobas positives. Clinical specimens exhibit a wide range of viral burden, with a significant portion at low levels. Analytical sensitivity of testing platforms is critical for reliable detection of SARS-CoV-2 and uniform care to patients.

15. **Disappearance of antibodies to SARS-CoV-2 in a Covid-19 patient after recovery.** Liu A, Wang W, Zhao X, et al. *Clin Microbiol Infect*. 2020 Jul 9:S1198-743X(20)30411-0. doi: 10.1016/j.cmi.2020.07.009. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7346807/>
Findings: We herein estimated the longevity of specific antibodies against SARS-CoV-2, and reported antibodies disappeared in a moderate COVID-19 patient within 3 months after the onset of the symptoms.
16. **Comparison of commercial lateral flow immunoassays and ELISA for SARS-CoV-2 antibody detection.** Martínez Serrano M, Navalpotro Rodríguez D, Tormo Palop N, et al. *J Clin Virol*. 2020 Jun 29;129:104529. doi: 10.1016/j.jcv.2020.104529. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7323682/>
Findings: Commercial serological tests are useful for detection of antibodies in patients with COVID-19. ELISA presented better results than LFI. The results allowed to incorporate the most sensitive LFI to the daily workflow, combining with ELISA. Careful validation is encouraged before clinical laboratories start using these tests.
17. **Systematic review with meta-analysis of the accuracy of diagnostic tests for COVID-19.** Böger B, Fachi MM, Vilhena RO, et al. *Am J Infect Control*. 2020 Jul 10;S0196-6553(20)30693-3. doi: 10.1016/j.ajic.2020.07.011. [https://www.ajicjournal.org/article/S0196-6553\(20\)30693-3/fulltext](https://www.ajicjournal.org/article/S0196-6553(20)30693-3/fulltext)
Findings: RT-PCR remains the gold standard for the diagnosis of COVID-19 in sputum samples. However, the combination of different diagnostic tests is highly recommended to achieve adequate sensitivity and specificity.

Epidemiology & Public Health

18. **Characteristics of Persons Who Died with COVID-19 — United States, February 12–May 18, 2020.** Wortham JM, Lee JT, Althomsons S, et al. *MMWR Morb Mortal Wkly Rep*. ePub: 10 July 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6928e1>
<https://www.cdc.gov/mmwr/volumes/69/wr/mm6928e1.htm>

Findings: Analysis of supplementary data for 10,647 decedents in 16 public health jurisdictions found that a majority were aged ≥ 65 years and most had underlying medical conditions. Overall, 34.9% of Hispanic and 29.5% of nonwhite decedents were aged < 65 years, compared with 13.2% of white, non-Hispanic decedents. Among decedents aged < 65 years, a total of 7.8% died in an emergency department or at home.

19. **Prevalence of SARS-CoV-2 in Spain (ENE-COVID): a nationwide, population-based seroepidemiological study.**

Pollán M, Pérez-Gómez B, Pastor-Barriuso R, et al. *Lancet*, July 6, 2020. DOI:[https://doi.org/10.1016/S0140-6736\(20\)31483-5](https://doi.org/10.1016/S0140-6736(20)31483-5)

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)31483-5/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31483-5/fulltext)

Findings: The majority of the Spanish population is seronegative to SARS-CoV-2 infection, even in hotspot areas. Seroprevalence was 5% by the point-of-care test and 4.6% by immunoassay. Most PCR-confirmed cases have detectable antibodies, but a substantial proportion of people with symptoms compatible with COVID-19 did not have a PCR test and at least a third of infections determined by serology were asymptomatic. These results emphasize the need for maintaining public health measures to avoid a new epidemic wave and add evidence against Herd Immunity.

20. **Statewide Interventions and Covid-19 Mortality in the United States: An Observational Study.**

Yehya N, Venkataramani A, Harhay MO. *Clin Infect Dis*. 2020 Jul 8:ciaa923. doi:

10.1093/cid/ciaa923. <https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa923/5868545>

Findings: At time of analysis, 37 of 50 states had ≥ 10 deaths and 28 follow-up days. Both later emergency declaration and later school closure were associated with more deaths. When assessing all 50 states and setting day 1 to the day a state recorded its first death, delays in declaring an emergency or closing schools were associated with more deaths. Results were unchanged when excluding New York and New Jersey. Later statewide emergency declarations and school closure were associated with higher Covid-19 mortality. Each day of delay increased mortality risk 5 to 6%.

21. **Update: COVID-19 among Workers in Meat and Poultry Processing Facilities — United States, April–May 2020.**

Waltenburg MA, Victoroff T, Rose CE, et al. *MMWR Morb Mortal Wkly Rep*.

ePub: 7 July 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6927e2>

https://www.cdc.gov/mmwr/volumes/69/wr/mm6927e2.htm?s_cid=mm6927e2_x

Findings: Among 23 states reporting COVID-19 outbreaks in meat and poultry processing facilities, 16,233 cases in 239 facilities occurred, including 86 (0.5%) COVID-19–related deaths. Among cases with race/ethnicity reported, 87% occurred among racial or ethnic minorities. Commonly implemented interventions included worker screening, source control measures (universal face coverings), engineering controls (physical barriers), and infection prevention measures (additional hand hygiene stations). Targeted workplace interventions and prevention efforts that are appropriately tailored to the groups most affected by COVID-19 are critical to reducing both COVID-19–associated occupational risk and health disparities among vulnerable populations.

22. **Increased Risk of COVID-19 Among Users of Proton Pump Inhibitors.** Almario CV, Chey WD, Spiegel BM, et al. *Am J Gastroenterol* July 7, 2020.
[https://journals.lww.com/ajg/Documents/AJG-20-1811_R1\(PUBLISH%20AS%20WEBPART\).pdf](https://journals.lww.com/ajg/Documents/AJG-20-1811_R1(PUBLISH%20AS%20WEBPART).pdf)
Findings: We found evidence of an independent, dose-response relationship between the use of anti-secretory medications and COVID-19 positivity; individuals taking PPIs twice daily have higher odds for reporting a positive test when compared to those using PPIs up to once daily, and those taking the less potent H2RAs are not at increased risk. Further studies examining the association between PPIs and COVID-19 are needed.
23. **Race/Ethnicity, Underlying Medical Conditions, Homelessness, and Hospitalization Status of Adult Patients with COVID-19 at an Urban Safety-Net Medical Center - Boston, Massachusetts, 2020.** Hsu HE, Ashe EM, Silverstein M, et al. *MMWR Morb Mortal Wkly Rep.* 2020 Jul 10;69(27):864-869. doi: 10.15585/mmwr.mm6927a3.
https://www.cdc.gov/mmwr/volumes/69/wr/mm6927a3.htm?s_cid=mm6927a3_w
Findings: This report describes the characteristics and clinical outcomes of adult patients with laboratory-confirmed COVID-19 treated at BMC during March 1-May 18, 2020. During this time, 2,729 patients with SARS-CoV-2 infection were treated at BMC and categorized into one of the following mutually exclusive clinical severity designations: exclusive outpatient management (1,543; 56.5%), non-intensive care unit (ICU) hospitalization (900; 33.0%), ICU hospitalization without invasive mechanical ventilation (69; 2.5%), ICU hospitalization with mechanical ventilation (119; 4.4%), and death (98; 3.6%). The cohort comprised 44.6% non-Hispanic black (black) patients and 30.1% Hispanic or Latino (Hispanic) patients. Persons experiencing homelessness accounted for 16.4% of patients. Most patients who died were aged ≥ 60 years (81.6%). Clinical severity differed by age, race/ethnicity, underlying medical conditions, and homelessness. A higher proportion of Hispanic patients were hospitalized (46.5%) than were black (39.5%) or non-Hispanic white (white) (34.4%) patients, a finding most pronounced among those aged < 60 years. A higher proportion of non-ICU inpatients were experiencing homelessness (24.3%), compared with homeless patients who were admitted to the ICU without mechanical ventilation (15.9%), with mechanical ventilation (15.1%), or who died (15.3%). Patient characteristics associated with illness and clinical severity, such as age, race/ethnicity, homelessness, and underlying medical conditions can inform tailored strategies that might improve outcomes and mitigate strain on the health care system from COVID-19.
24. **Incidence of Stress Cardiomyopathy During the Coronavirus Disease 2019 Pandemic.** Jabri A, Kalra A, Kumar A, et al. *JAMA Netw Open.* 2020 Jul 1;3(7):e2014780. doi: 10.1001/jamanetworkopen.2020.14780.
<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2768093>
Findings: Among 1914 patient presenting with acute coronary syndrome, 1656 patients (age, 67 [59-74]; 1094 [66.1%] men) presented during the pre-COVID-19 period (390 patients in March-April 2018, 309 patients in January-February 2019, 679 patients in March-April 2019, and 278 patients in January-February 2020), and 258 patients (median [interquartile range] age, 67 [57-75]; 175 [67.8%] men) presented during the COVID-19 pandemic period (ie, March-April 2020). There was a significant increase in the incidence of stress cardiomyopathy during the COVID-19 period, with a total of 20 patients with stress cardiomyopathy (incidence proportion, 7.8%),

compared with prepandemic timelines, which ranged from 5 to 12 patients with stress cardiomyopathy (incidence proportion range, 1.5%-1.8%). Patients with stress cardiomyopathy during the COVID-19 pandemic had a longer median (interquartile range) hospital length of stay compared with those hospitalized in the prepandemic period.

25. **Coronavirus disease among persons with sickle cell disease, United States, March 20–May 21, 2020.** Panepinto JA, Brandow A, Mucalo L, et al. *Emerg Infect Dis.* 2020 Oct [cited 2020 Jul 10]. <https://doi.org/10.3201/eid2610.202792> https://wwwnc.cdc.gov/eid/article/26/10/20-2792_article

Findings: Sickle cell disease (SCD) disproportionately affects Black or African American persons in the United States and can cause multisystem organ damage and reduced lifespan. Among 178 persons with SCD in the United States who were reported to an SCD–coronavirus disease case registry, 122 (69%) were hospitalized and 13 (7%) died.

26. **Prevalence, Characteristics, Risk Factors, and Outcomes of Invasively Ventilated COVID-19 Patients with Acute Kidney Injury and Renal Replacement Therapy.** Fominskiy EV, Scandroglio AM, Monti G, et al. *Blood Purif.* 2020 Jul 13;1-8. doi: 10.1159/000508657. <https://www.karger.com/Article/FullText/508657>

Findings: Among invasively ventilated COVID-19 patients, AKI is very common and CRRT use is common. Both carry a high risk of in-hospital mortality. Hospital mortality was 38.9% for AKI and 52.9% for CRRT patients.

Healthcare Delivery & Healthcare Workers

27. **Critical Insights from Patients during the Covid-19 Pandemic.** Patel S, Lorenzi N, Smith T, Carlson BR, Sternberg P. *NEJM Catalyst* 2020 Jul 13. <https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0299>

Findings: As health care systems look to resume normal operations during the Covid-19 pandemic, we must understand why patients are concerned about seeking care. This understanding will help guide strategies to ensure patient safety. In a survey of more than 1,300 patients at Vanderbilt University Medical Center, they said their biggest fear in returning to routine health care is the risk of getting sick from other patients. Under the appropriate circumstances and with key safety measures in place, patients are expressing a guarded willingness to reengage the health care system and resume routine care. As was the case before the pandemic, patients primarily will place their trust in health care providers.

28. **Managing Anxiety in Anesthesiology and Intensive Care Providers during the Covid-19 Pandemic: An Analysis of the Psychosocial Response of a Front-Line Department.** Fleisher LA, Sweeney RE, Clapp JT, Barsade SG. *NEJM Catalyst.* 2020 Jul 8. <https://catalyst.nejm.org/doi/full/10.1056/cat.20.0270>

Findings: We studied the factors most related to front-line providers' anxiety, and thereby developed effective responses, by surveying the clinical members of our department to better understand the effect of providing care during the pandemic on their self-reported levels of anxiety. While the strongest predictor of anxiety during the pandemic is a clinician's general

tendency to feel anxious, another strong predictor is the culture of anxiety they observed in their colleagues around them related to the pandemic. Feeling like one's work during the pandemic is valued by one's immediate supervisor was associated with lower anxiety. Also, feeling like one has the necessary PPE to maintain safety and that one is in a psychologically safe environment were both related to a lower culture of anxiety, and as such indirectly related to lower state anxiety. In this paper, we provide a number of suggestions for reducing the anxiety felt during this anxiety-inducing crisis, as well as promoting the emotional well-being and effectiveness of our front-line providers in addressing the Covid-19 pandemic. While the study was conducted among anesthesia providers, we believe its results are applicable to any front-line providers working in the high-stress Covid-19 environment.

29. Risk Factors for Healthcare Personnel Infection with Endemic Coronaviruses (HKU1, OC43, NL63, 229E): Results from the Respiratory Protection Effectiveness Clinical Trial (ResPECT).

Cummings DAT, Radonovich LJ, Gorse GJ, et al. *Clin Infect Dis*. 2020 Jul 9:ciaa900. doi: 10.1093/cid/ciaa900. <https://academic.oup.com/cid/article-abstract/doi/10.1093/cid/ciaa900/5869459>

Findings: Among 4,689 HCP-seasons, we detected coronavirus infection in 387 (8%). HCP who participated in an aerosol generation procedure (AGP) at least once during the viral respiratory season were 105% (95% CI 21%, 240%) more likely to be diagnosed with a laboratory-confirmed coronavirus infection. Younger individuals, those who saw pediatric patients and those with household members under the age of five were at increased risk of coronavirus infection. Our analysis suggests the risk of HCP becoming infected with an endemic coronavirus increases approximately two-fold with exposures to AGP. Our findings may be relevant to the Coronavirus Disease 2019 (COVID-19) pandemic; however, SARS-COV-2, the virus that causes COVID-19, may differ from endemic coronaviruses in important ways.

30. Nurse Staffing and Coronavirus Infections in California Nursing Homes. Harrington C, Ross L, Chapman S, et al. *Policy Polit Nurs Pract*. 2020 Jul 7:1527154420938707. doi:

10.1177/1527154420938707. <https://journals.sagepub.com/doi/full/10.1177/1527154420938707>

Findings: Results indicate that nursing homes with total RN staffing levels under the recommended minimum standard (0.75 hours per resident day) had a two times greater probability of having COVID-19 resident infections. Nursing homes with lower Medicare five-star ratings on total nurse and RN staffing levels (adjusted for acuity), higher total health deficiencies, and more beds had a higher probability of having COVID-19 residents. Nursing homes with low RN and total staffing levels appear to leave residents vulnerable to COVID-19 infections. Establishing minimum staffing standards at the federal and state levels could prevent this in the future.

31. Coronavirus Disease 2019 Pandemic Measures: Reports from a National Survey of 9,120 ICU Clinicians. Kleinpell R, Ferraro DM, Maves RC, et al. *Crit Care Med*. 2020 Jul

2:10.1097/CCM.0000000000004521. doi:10.1097/CCM.0000000000004521. https://journals.lww.com/ccmjournal/Abstract/9000/Coronavirus_Disease_2019_Pandemic_Measures_.95593.aspx

Findings: Through a 16-item descriptive questionnaire, ICU clinician perceptions were assessed regarding current and emerging critical ICU needs in managing the severe acute respiratory syndrome coronavirus 2 infected patients, resource levels, concerns about being exposed to severe acute respiratory syndrome coronavirus 2, and perceived level of personal stress. A total of 9,120 ICU clinicians responded to the survey, representing all 50 U.S. states, with 4,106 (56.9%) working in states with 20,000 or more coronavirus disease 2019 cases. The 7,317 respondents who indicated their profession included ICU nurses (n = 6,731, 91.3%), advanced practice providers (nurse practitioners and physician assistants; n = 334, 4.5%), physicians (n = 212, 2.9%), respiratory therapists (n = 31, 0.4%), and pharmacists (n = 30, 0.4%). A majority (n = 6,510, 88%) reported having cared for a patient with presumed or confirmed coronavirus disease 2019. The most critical ICU needs identified were personal protective equipment, specifically N95 respirator availability, and ICU staffing. Minimizing healthcare worker virus exposure during care was believed to be the most challenging aspect of coronavirus disease 2019 patient care (n = 2,323, 30.9%). Nurses report a high level of concern about exposing family members to severe acute respiratory syndrome coronavirus 2 (median score of 10 on 0-10 scale). Similarly, the level of concern reached the maximum score of 10 in ICU clinicians who had provided care to coronavirus disease 2019 patients. This national ICU clinician survey identifies continued concerns regarding personal protective equipment supplies with the chief issue being N95 respirator availability. As the pandemic continues, ICU clinicians anticipate a number of limited resources that may impact ICU care including personnel, capacity, and surge potential, as well as staff and subsequent family members exposure to severe acute respiratory syndrome coronavirus 2. These persistent concerns greatly magnify personal stress, offering a therapeutic target for professional organization and facility intervention efforts.

32. **Pandemic peak SARS-CoV-2 infection and seroconversion rates in London frontline health-care workers.** Houlihan CF, Vora N, Byrne T, et al. *Lancet*. 2020 Jul 9:S0140-6736(20)31484-7. doi: 10.1016/S0140-6736(20)31484-7.

[https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(20\)31484-7.pdf](https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(20)31484-7.pdf)

Findings: Our finding that 44% of HCWs show evidence of SARS-CoV-2 infection either by RT-PCR or serology in a frontline setting is higher than reported by others in the UK and worldwide. Evidence of infection in our central London HCWs was more than double that of the London population.

Laboratory Results

33. **Serum antibody response in critically ill patients with COVID-19.** Longchamp A, Longchamp J, Croxatto A, et al. *Intensive Care Med*. 2020 Jul 8. doi: 10.1007/s00134-020-06171-7.

<https://link.springer.com/article/10.1007/s00134-020-06171-7>

Findings: We analyzed the antibody response in 28 critically ill patients, with laboratory confirmed SARS-Cov-2 infection, admitted to Sion hospital ICU (Switzerland), between March 8th and April 4th, 2020. Only patients with serum samples available at two different time points were included. Experimental methods are described in the electronic supplementary material.

Prognosis

34. **Persistent Symptoms in Patients After Acute COVID-19.** Carfi A, Bernabei R, Landi F, et al. *JAMA*. July 9, 2020. doi:10.1001/jama.2020.12603
<https://jamanetwork.com/journals/jama/fullarticle/2768351>
Findings: This study found that in patients who had recovered from COVID-19, 87.4% reported persistence of at least 1 symptom, particularly fatigue and dyspnea.

35. **OpenSAFELY: factors associated with COVID-19 death in 17 million patients.** Williamson EJ, Walker AJ, Bhaskaran K, et al. *Nature*. 2020 Jul 8. doi: 10.1038/s41586-020-2521-4.
[https://www.nature.com/articles/s41586-020-2521-](https://www.nature.com/articles/s41586-020-2521-4)
[4 reference.pdf?referringSource=articleShare](#)
Findings: Working on behalf of NHS England, here we created OpenSAFELY: a secure health analytics platform covering 40% of all patients in England, holding patient data within the existing data centre of a major primary care electronic health records vendor. Primary care records of 17,278,392 adults were pseudonymously linked to 10,926 COVID-19-related deaths. COVID-19-related death was associated with: being male (hazard ratio (HR) 1.59, 95% confidence interval (CI) 1.53-1.65); older age and (both with a strong gradient); diabetes; severe asthma; and various other medical conditions. Compared with people with white ethnicity, Black and South Asian people were at higher risk even after adjustment for other factors (HR 1.48, 1.30-1.69 and 1.44, 1.32-1.58, respectively). We have quantified a range of clinical risk factors for COVID-19-related death in the largest cohort study conducted by any country to date. OpenSAFELY is rapidly adding further patients' records; we will update and extend results regularly.

36. **Time-dependent changes in the clinical characteristics and prognosis of hospitalized COVID-19 patients in Wuhan, China: A retrospective study.** Wang M, Zhang J, Ye D, et al. *Clin Chim Acta*. 2020 Jul 6:S0009-8981(20)30315-6. doi: 10.1016/j.cca.2020.06.051.
<https://www.sciencedirect.com/science/article/pii/S0009898120303156>
Findings: According to the onset time of clinical symptoms, 843 COVID-19 patients admitted between Jan 22 and Feb 14, 2020 were divided into three groups. Data on the demographics, symptoms, first laboratory results, treatments and outcomes (within 12 days of hospitalization) were collected. The results showed that the median duration from symptom onset to admission shortened over time (12.5, 10 and 5 days, respectively, $p < 0.05$). Fewer patients had fever symptoms and bilateral pneumonia in group C than in the group A and B. Laboratory results showed that white blood cell, neutrophil, and platelet counts, lactic acid and D-dimer levels were lower, while lymphocyte, CD3, and CD8 counts were higher in group C. In addition, group C had more mild-moderate cases and fewer severe cases than the other two groups. More importantly, the incidence of complications (18.5%, 14.2% and 11.2%, respectively, $p < 0.05$) and all-cause mortality (11.7%, 8.4%, and 5.6%, respectively, $p < 0.05$) decreased over time. The clinical characteristics and prognosis of COVID-19 patients changed over time. Improved prognosis was found at a later stage.

37. **Association of Padua prediction score with in-hospital prognosis in COVID-19 patients.** Zeng DX, Xu JL, Mao QX, et al. *QJM*. 2020 Jul 11:hcaa224. doi: 10.1093/qjmed/hcaa224. <https://clinowl.com/association-of-padua-prediction-score-with-in-hospital-prognosis-in-covid-19-patients/>
Findings: Higher PPS associated with in-hospital poor prognosis in COVID-19 patients. Prophylactic anticoagulation showed a mild advantage of mortality in COVID-19 patients with higher PPS, but it remain need further investigation.
38. **Development and Validation of a Nomogram for Assessing Survival in Patients with COVID-19 Pneumonia.** Dong YM, Sun J, Li YX, et al. *Clin Infect Dis*. 2020 Jul 10:ciaa963. doi: 10.1093/cid/ciaa963. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7233581/>
Findings: Hypertension, higher neutrophil-to-lymphocyte ratio and increased NT-proBNP value were found to be significantly associated with poorer prognosis in hospitalized patients with COVID-19. The three predictors were further used to build a prediction nomogram. We managed to build a predictive model and constructed a nomogram for predicting in-hospital survival of patients with COVID-19. This model represents good performance and might be utilized clinically in the management of COVID-19.
39. **Fasting blood glucose at admission is an independent predictor for 28-day mortality in patients with COVID-19 without previous diagnosis of diabetes: a multi-centre retrospective study.** Wang S, Ma P, Zhang S, et al. *Diabetologia*. 2020 Jul 10:1-10. doi: 10.1007/s00125-020-05209-1. <https://link.springer.com/article/10.1007/s00125-020-05209-1>
Findings: FBG ≥ 7.0 mmol/l at admission is an independent predictor for 28-day mortality in patients with COVID-19 without previous diagnosis of diabetes. Glycaemic testing and control are important to all COVID-19 patients even where they have no pre-existing diabetes, as most COVID-19 patients are prone to glucose metabolic disorders.
40. **Association of Initial Viral Load in SARS-CoV-2 Patients with Outcome and Symptoms.** Argyropoulos KV, Serrano A, Hu J, et al. *Am J Pathol*. 2020 Jul 7:S0002-9440(20)30333-3. doi: 10.1016/j.ajpath.2020.06.012. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7332909/>
Findings: We found that diagnostic viral load is significantly lower in hospitalized patients than in patients not hospitalized after adjusting for age, sex, race, BMI, and comorbidities. Higher VL was associated with shorter duration of the symptoms in all patients and hospitalized patients only and shorter hospital stay. No significant association was noted between VL, admission to ICU, length of oxygen support, and overall survival. Our findings suggest a higher shedding risk in less symptomatic patients; an important consideration for containment strategies in SARS-CoV-2. Furthermore, we identify a novel association between viral load and history of cancer. Larger studies are warranted to validate our findings.
41. **Kinetics of viral load and antibody response in relation to COVID-19 severity.** Wang Y, Zhang L, Sang L, et al. *J Clin Invest*. 2020 Jul 7:138759. doi: 10.1172/JCI138759. <https://www.jci.org/articles/view/138759/version/1/pdf/render.pdf>
Findings: Two groups of RT-PCR confirmed COVID-19 patients were enrolled in this study, including 12 severe patients in ICUs who needed mechanical ventilation and 11 mild patients in

isolation wards. Serial clinical samples were collected for laboratory detection. Results showed that most of the severe patients had viral shedding in a variety of tissues for 20~40 days post onset of disease (8/12, 66.7%); while the majority of mild patients had viral shedding restricted to the respiratory tract and had no detectable virus RNA after 10 days post-onset (9/11, 81.8%). Mild patients showed significantly lower IgM response compared with that of the severe group. IgG responses were detected in most patients in both severe and mild groups at 9 days post onset and remained high level throughout the study. Antibodies cross-reactive to SARS-CoV and SARS-CoV-2 were detected in COVID-19 patients but not in MERS patients. High-levels of neutralizing antibodies were induced after about 10 days post onset in both severe and mild patients which were higher in the severe group. SARS-CoV-2 pseudotype neutralization test and focus reduction neutralization test with authentic virus showed consistent results. Sera from COVID-19 patients, but not convalescent SARS and MERS patients inhibited SARS-CoV-2 entry. Anti-SARS-CoV-2 S and N IgG level exhibited moderate correlation with neutralization titers in patients' plasma. This study improves our understanding of immune response in human after SARS-CoV-2 infection.

42. **Haematological characteristics and risk factors in the classification and prognosis evaluation of COVID-19: a retrospective cohort study.** Liao D, Zhou F, Luo L, et al. *Lancet Haematol.* 2020 Jul 10;S2352-3026(20)30217-9. doi: 10.1016/S2352-3026(20)30217-9.
[https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026\(20\)30217-9/fulltext](https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(20)30217-9/fulltext)
Findings: Rapid blood tests, including platelet count, prothrombin time, D-dimer, and neutrophil to lymphocyte ratio can help clinicians to assess severity and prognosis of patients with COVID-19. The sepsis-induced coagulopathy scoring system can be used for early assessment and management of patients with critical disease.
43. **Blood type and outcomes in patients with COVID-19.** Latz CA, DeCarlo C, Boitano L, et al. *Ann Hematol.* 2020 Jul 12. doi: 10.1007/s00277-020-04169-1.
<https://link.springer.com/article/10.1007/s00277-020-04169-1>
Findings: Blood type was not associated with risk of intubation or death in patients with COVID-19. Patients with blood types B and AB who received a test were more likely to test positive and blood type O was less likely to test positive. Rh+ patients were more likely to test positive.
44. **Prognostic Value of Right Ventricular Longitudinal Strain in Patients With COVID-19.** Li Y, Li H, Zhu S, et al. *JACC Cardiovasc Imaging.* 2020 Apr 28;S1936-878X(20)30342-9. doi: 10.1016/j.jcmg.2020.04.014.
<https://imaging.onlinejacc.org/content/early/2020/04/20/j.jcmg.2020.04.014>
Findings: One hundred twenty consecutive patients with COVID-19 who underwent echocardiographic examinations were enrolled in our study. Compared with patients in the highest RVLS tertile, those in the lowest tertile were more likely to have higher heart rate; elevated levels of D-dimer and C-reactive protein; more high-flow oxygen and invasive mechanical ventilation therapy; higher incidence of acute heart injury, acute respiratory distress syndrome, and deep vein thrombosis; and higher mortality. RVLS is a powerful predictor of higher mortality in patients with COVID-19. These results support the application of RVLS to identify higher risk patients with COVID-19.

Therapeutics

45. **Gilead Presents Additional Data on Investigational Antiviral Remdesivir for the Treatment of COVID-19.** 2020, July 10.
<https://www.gilead.com/news-and-press/press-room/press-releases/2020/7/gilead-presents-additional-data-on-investigational-antiviral-remdesivir-for-the-treatment-of-covid-19>

46. **Pathophysiology, Transmission, Diagnosis, and Treatment of Coronavirus Disease 2019 (COVID-19): A Review.** Wiersinga WJ, Rhodes A, Cheng AC, et al. *JAMA*. 2020 Jul 10. doi: 10.1001/jama.2020.12839. <https://jamanetwork.com/journals/jama/fullarticle/2768391>
Findings: SARS-CoV-2 is spread primarily via respiratory droplets during close face-to-face contact. Infection can be spread by asymptomatic, presymptomatic, and symptomatic carriers. The average time from exposure to symptom onset is 5 days, and 97.5% of people who develop symptoms do so within 11.5 days. The most common symptoms are fever, dry cough, and shortness of breath. Radiographic and laboratory abnormalities, such as lymphopenia and elevated lactate dehydrogenase, are common, but nonspecific. Diagnosis is made by detection of SARS-CoV-2 via reverse transcription polymerase chain reaction testing, although false-negative test results may occur in up to 20% to 67% of patients; however, this is dependent on the quality and timing of testing. Manifestations of COVID-19 include asymptomatic carriers and fulminant disease characterized by sepsis and acute respiratory failure. Approximately 5% of patients with COVID-19, and 20% of those hospitalized, experience severe symptoms necessitating intensive care. More than 75% of patients hospitalized with COVID-19 require supplemental oxygen. Treatment for individuals with COVID-19 includes best practices for supportive management of acute hypoxic respiratory failure. Emerging data indicate that dexamethasone therapy reduces 28-day mortality in patients requiring supplemental oxygen compared with usual care (21.6% vs 24.6%; age-adjusted rate ratio, 0.83 [95% CI, 0.74-0.92]) and that remdesivir improves time to recovery (hospital discharge or no supplemental oxygen requirement) from 15 to 11 days. In a randomized trial of 103 patients with COVID-19, convalescent plasma did not shorten time to recovery. Ongoing trials are testing antiviral therapies, immune modulators, and anticoagulants. The case-fatality rate for COVID-19 varies markedly by age, ranging from 0.3 deaths per 1000 cases among patients aged 5 to 17 years to 304.9 deaths per 1000 cases among patients aged 85 years or older in the US. Among patients hospitalized in the intensive care unit, the case fatality is up to 40%. At least 120 SARS-CoV-2 vaccines are under development. Until an effective vaccine is available, the primary methods to reduce spread are face masks, social distancing, and contact tracing. Monoclonal antibodies and hyperimmune globulin may provide additional preventive strategies.

47. **Corticosteroid therapy for patients with CoVID-19 pneumonia: a before-after study.** Bani-Sadr F, Hentzien M, Pascard M, et al. *Int J Antimicrob Agents*. 2020 Jul 4:106077. doi: 10.1016/j.ijantimicag.2020.106077. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7342082/>
Findings: Between March 3rd and April 14th 2020, 257 patients with CoVID-19 diagnosis were included. As corticosteroids were wide used since 27 March 2020, two periods were considered for the purposes of our study: the before period from March 3rd to 20th (n= 85) and the "after

period" (n=172) from March 26th to April 14th 2020. The "after" period was associated with a lower risk of death (HR 0.47; 95% CI, 0.23 - 0.97; p=0.04), and a lower risk of intensive care admission or death before ICU admission (HR 0.37 95% CI 0.21 - 0.64; p=0.0005) by multivariate analysis adjusted for age, National Early Warning score and institutionalization status. In the "after period", the addition of corticosteroids to our institution's CoVID-19 treatment protocol was associated with a significant reduction in hospital mortality.

48. **COVID-19-associated acute respiratory distress syndrome: is a different approach to management warranted?** Fan E, Beitler JR, Brochard L, et al. *Lancet Respir Med*. 2020 Jul 6:S2213-2600(20)30304-0. doi: 10.1016/S2213-2600(20)30304-0.
[https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30304-0/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30304-0/fulltext)
Findings: In this Viewpoint, we address ventilatory strategies in the context of recent discussions on phenotypic heterogeneity in patients with COVID-19-associated ARDS. Although early reports suggested that COVID-19-associated ARDS has distinctive features that set it apart from historical ARDS, emerging evidence indicates that the respiratory system mechanics of patients with ARDS, with or without COVID-19, are broadly similar. In the absence of evidence to support a shift away from the current paradigm of ventilatory management, we strongly recommend adherence to evidence-based management, informed by bedside physiology, as resources permit.
49. **Lopinavir-ritonavir Treatment for COVID-19 Infection in Intensive Care Unit: Risk of Bradycardia.** Beyls C, Martin N, Hermida A, et al. *Circulation: Arrhythmia and Electrophysiology* 2020. <https://www.ahajournals.org/doi/pdf/10.1161/CIRCEP.120.008798>
Findings: We prospectively included 41 Covid-19 patients who received LPV/RTV treatment. Nine (22%) patients experienced bradycardia. Among the 9 cases of bradycardia, 8 (88%) were sinus bradycardia and one (12%) third degree atrioventricular block. Causality may be considered as bradycardia occurred at least 48 h after LPV/RTV initiation, bradycardia resolved after discontinuation or dose reduction of LPV/RTV and no alternative cause was found. Patients who presented bradycardia were older (73[62-80]vs 62[54-68] years; p=0.009) had a higher RTV plasma concentration at 72 hours (1249[820-1374] vs 652[406-1176] ng.ml⁻¹; p=0.036) and a lower lymphocyte count (500[265-105] vs 710[600-800] 10⁶ .l⁻¹; p=0.006).
50. **Inflammation resolution: a dual-pronged approach to averting cytokine storms in COVID-19?** Panigrahy D, Gilligan MM, Huang Sui – PSJH author, ISB. *Cancer Metastasis Rev*. 2020 Jun;39(2):337-340. doi: 10.1007/s10555-020-09889-4.
<https://link.springer.com/article/10.1007/s10555-020-09889-4>
Findings: While most COVID-19 clinical trials focus on "anti-viral" and "anti-inflammatory" strategies, stimulating inflammation resolution is a novel host-centric therapeutic avenue. We discuss using pro-resolution mediators as a potential complement to current anti-viral strategies for COVID-19.
51. **Tocilizumab for treatment of mechanically ventilated patients with COVID-19.** Somers EC, Eschenauer GA, Troost JP, et al. *Clin Infect Dis*. 2020 Jul 11:ciaa954. doi: 10.1093/cid/ciaa954.
<https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa954/5870306>

Findings: In this cohort of mechanically ventilated COVID-19 patients, tocilizumab was associated with lower mortality despite higher superinfection occurrence.

See also: **SAFETY AND EFFICACY OF ANTI-IL6-RECEPTOR TOCILIZUMAB USE IN SEVERE AND CRITICAL PATIENTS AFFECTED BY CORONAVIRUS DISEASE 2019: A COMPARATIVE ANALYSIS.** Rossotti R, Travi G, Ughi N, et al. *J Infect.* 2020 Jul 8:S0163-4453(20)30467-9. doi: 10.1016/j.jinf.2020.07.008.

52. **Personalized therapy approach for hospitalized patients with COVID-19.** Garcia-Vidal C, Moreno-García E, Hernández-Meneses M, et al. *Clin Infect Dis.* 2020 Jul 10:ciaa964. doi: 10.1093/cid/ciaa964. <https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa964/5869871>
Findings: Hospitalized patients with COVID-19 experiencing respiratory symptoms have different complications (inflammatory, co-infection and thrombotic) that are identifiable by analytics patterns. Personalized treatment decisions decreased early mortality (OR 0.144, CI 0.03-0.686; p=0.015). Increasing age (OR 1.06; p=0.038) and therapeutic effort limitation (OR 9.684; p<0.001) were associated with higher mortality.
53. **Convalescent plasma or hyperimmune immunoglobulin for people with COVID-19: a living systematic review.** Piechotta V, Chai KL, Valk SJ, et al. *Cochrane Database Syst Rev.* 2020 Jul 10;7:CD013600. doi: 10.1002/14651858.CD013600.pub2. <https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013600.pub2/full/en>
Findings: We are very uncertain whether convalescent plasma is beneficial for people admitted to hospital with COVID-19. For safety outcomes we also included non-controlled NRSIs. There was limited information regarding adverse events. Of the controlled studies, none reported on this outcome in the control group. There is only very low-certainty evidence for safety of convalescent plasma for COVID-19. While major efforts to conduct research on COVID-19 are being made, problems with recruiting the anticipated number of participants into these studies are conceivable. The early termination of the first RCT investigating convalescent plasma, and the multitude of studies registered in the past months illustrate this. It is therefore necessary to critically assess the design of these registered studies, and well-designed studies should be prioritised. Other considerations for these studies are the need to report outcomes for all study arms in the same way, and the importance of maintaining comparability in terms of co-interventions administered in all study arms. There are 98 ongoing studies evaluating convalescent plasma and hyperimmune immunoglobulin, of which 50 are RCTs. This is the first living update of the review, and we will continue to update this review periodically. These updates may show different results to those reported here.
54. **BCG vaccine protection from severe coronavirus disease 2019 (COVID-19).** Escobar LE, Molina-Cruz A, Barillas-Mury C. *Proc Natl Acad Sci U S A.* 2020 Jul 9:202008410. doi: 10.1073/pnas.2008410117. <https://www.pnas.org/content/early/2020/07/07/2008410117>
Findings: We review evidence for a potential biological basis of BCG cross-protection from severe COVID-19, and refine the epidemiological analysis to mitigate effects of potentially confounding factors (e.g., stage of the COVID-19 epidemic, development, rurality, population density, and age structure). A strong correlation between the BCG index, an estimation of the degree of universal BCG vaccination deployment in a country, and COVID-19 mortality in

different socially similar European countries was observed ($r^2 = 0.88$; $P = 8 \times 10^{-7}$), indicating that every 10% increase in the BCG index was associated with a 10.4% reduction in COVID-19 mortality. Results fail to confirm the null hypothesis of no association between BCG vaccination and COVID-19 mortality, and suggest that BCG could have a protective effect. Nevertheless, the analyses are restricted to coarse-scale signals and should be considered with caution. BCG vaccination clinical trials are required to corroborate the patterns detected here, and to establish causality between BCG vaccination and protection from severe COVID-19. Public health implications of a plausible BCG cross-protection from severe COVID-19 are discussed.

Transmission / Infection Control

55. **Investigating SARS-CoV-2 surface and air contamination in an acute healthcare setting during the peak of the COVID-19 pandemic in London.** Zhou J, Otter JA, Price JR, et al. *Clin Infect Dis*. 2020 Jul 8:ciaa905. doi: 10.1093/cid/ciaa905. <https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa905/5868534>
Findings: Viral RNA was detected on 114/218 (52.3%) of surfaces and 14/31 (38.7%) air samples but no virus was cultured. The proportion of surface samples contaminated with viral RNA varied by item sampled and by clinical area. Viral RNA was detected on surfaces and in air in public areas of the hospital but was more likely to be found in areas immediately occupied by COVID-19 patients than in other areas (67/105 (63.8%) vs. 29/64 (45.3%) (odds ratio 0.5, 95% confidence interval 0.2-0.9, $p=0.025$, Chi squared test)). The high PCR Ct value for all samples (>30) indicated that the virus would not be culturable. Our findings of extensive viral RNA contamination of surfaces and air across a range of acute healthcare settings in the absence of cultured virus underlines the potential risk from environmental contamination in managing COVID-19, and the need for effective use of PPE, physical distancing, and hand/surface hygiene.
56. **COVID-19 Infection: Strategies on When to Discontinue Isolation, a retrospective study.** Woodruff A, Walsh KL, Knight D, Irizarry-Alvarado JM. *Am J Infect Control*. 2020 Jul 4:S0196-6553(20)30644-1. doi: 10.1016/j.ajic.2020.06.220. [https://www.ajicjournal.org/article/S0196-6553\(20\)30644-1/fulltext](https://www.ajicjournal.org/article/S0196-6553(20)30644-1/fulltext)
Findings: 118 patients with detectable results for SARS-CoV-2 were followed in the Mayo Clinic Florida COVID Virtual Clinic; 53% of patients still showed detectable viral RNA despite meeting CDC guidelines for discontinuation of self-isolation, prompting us to propose following a more cautious guideline that other providers could consider as a strategy to discontinue self-isolation, including increasing length of days since symptom onset.
57. **Kinetics of viral load and antibody response in relation to COVID-19 severity.** Wang Y, Zhang L, Sang L, et al. *J Clin Invest*. 2020 Jul 7:138759. doi: 10.1172/JCI138759. <https://www.jci.org/articles/view/138759/version/1/pdf/render.pdf>
Findings: Two groups of RT-PCR confirmed COVID-19 patients were enrolled in this study, including 12 severe patients in ICUs who needed mechanical ventilation and 11 mild patients in isolation wards. Serial clinical samples were collected for laboratory detection. Results showed that most of the severe patients had viral shedding in a variety of tissues for 20~40 days post onset of disease (8/12, 66.7%); while the majority of mild patients had viral shedding restricted

to the respiratory tract and had no detectable virus RNA after 10 days post-onset (9/11, 81.8%). Mild patients showed significantly lower IgM response compared with that of the severe group. IgG responses were detected in most patients in both severe and mild groups at 9 days post onset and remained high level throughout the study. Antibodies cross-reactive to SARS-CoV and SARS-CoV-2 were detected in COVID-19 patients but not in MERS patients. High-levels of neutralizing antibodies were induced after about 10 days post onset in both severe and mild patients which were higher in the severe group. SARS-CoV-2 pseudotype neutralization test and focus reduction neutralization test with authentic virus showed consistent results. Sera from COVID-19 patients, but not convalescent SARS and MERS patients inhibited SARS-CoV-2 entry. Anti-SARS-CoV-2 S and N IgG level exhibited moderate correlation with neutralization titers in patients' plasma. This study improves our understanding of immune response in human after SARS-CoV-2 infection.

58. **The Implications of Silent Transmission for the Control of COVID-19 Outbreaks.** Moghadas SM, Fitzpatrick MC, Sah P, et al. *Proc Natl Acad Sci U S A*. 2020 Jul 6;202008373. doi: 10.1073/pnas.2008373117.

<https://www.pnas.org/content/pnas/early/2020/07/02/2008373117.full.pdf>

Findings: We evaluated the contribution of presymptomatic and asymptomatic transmission based on recent individual-level data regarding infectiousness prior to symptom onset and the asymptomatic proportion among all infections. We found that the majority of incidences may be attributable to silent transmission from a combination of the presymptomatic and asymptomatic. Even if all symptomatic cases are isolated, a vast outbreak may nonetheless unfold. Over one-third of silent infections must be isolated to suppress a future outbreak below 1% of the population. Our results indicate that symptom-based isolation must be supplemented by rapid contact tracing and testing that identifies asymptomatic and presymptomatic cases, in order to safely lift current restrictions and minimize the risk of resurgence.

59. **Initial and Repeated Point Prevalence Surveys to Inform SARS-CoV-2 Infection Prevention in 26 Skilled Nursing Facilities - Detroit, Michigan, March-May 2020.** Sanchez GV, Biedron C, Fink LR, et al. *MMWR Morb Mortal Wkly Rep*. 2020 Jul 10;69(27):882-886. doi:

10.15585/mmwr.mm6927e1. <https://www.cdc.gov/mmwr/volumes/69/wr/mm6927e1.htm>

Findings: During March 2020, the Detroit Health Department and area hospitals detected a sharp increase in COVID-19 diagnoses, hospitalizations, and associated deaths among SNF residents. From March 7-May 8, among 2,773 residents of 26 Detroit SNFs, 1,207 laboratory-confirmed cases of COVID-19 were identified during three periods: before (March 7-April 7) and after two point prevalence surveys (April 8-25 and April 30-May 8): the overall attack rate was 44%. Within 21 days of receiving their first positive test results, 446 (37%) of 1,207 COVID-19 patients were hospitalized, and 287 (24%) died. Among facilities participating in both surveys (n = 12), the percentage of positive test results declined from 35% to 18%. Repeated point prevalence surveys in SNFs identified asymptomatic COVID-19 cases, informed cohorting and IPC practices aimed at reducing transmission, and guided prioritization of health department resources for facilities experiencing high levels of SARS-CoV-2 transmission. With the increased availability of SARS-CoV-2 testing, repeated point prevalence surveys and enhanced and

expanded IPC support should be standard tools for interrupting and preventing COVID-19 outbreaks in SNFs.

60. Environmental Detection of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) from Medical Equipment in Long-Term Care Facilities undergoing COVID-19 Outbreaks.

Nelson A, Kassimatis J, Estoque J, et al. *Am J Infect Control*. 2020 Jul 6:S0196-6553(20)30643-X. doi: 10.1016/j.ajic.2020.07.001. [https://www.ajicjournal.org/article/S0196-6553\(20\)30643-X/fulltext](https://www.ajicjournal.org/article/S0196-6553(20)30643-X/fulltext)

Findings: We conducted environmental sampling at long-term care facilities to determine the extent of surface contamination with SARS-CoV-2 virus. Medical equipment used throughout the facility was determined to be contaminated.

61. Disinfection of N95 masks artificially contaminated with SARS-CoV-2 and ESKAPE bacteria using hydrogen peroxide plasma: impact on the reutilization of disposable devices. Ibáñez-Cervantes G, Bravata-Alcántara JC, Nájera-Cortés AS, et al. *Am J Infect Control*. 2020 Jul 6:S0196-6553(20)30639-8. doi: 10.1016/j.ajic.2020.06.216.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7336929/>

Findings: Disinfection of N95 masks by using the hydrogen peroxide plasma technology can be an alternative for their reuse in a shortage situation. Implications for the use of disinfection technologies of N95 masks and the safety of health personnel are discussed.

62. Decontamination Interventions for the Reuse of Surgical Mask Personal Protective Equipment: A Systematic Review. Zorko DJ, Gertsman S, O'Hearn K, et al. *J Hosp Infect*. 2020 Jul 9:S0195-6701(20)30337-6. doi: 10.1016/j.jhin.2020.07.007.

<https://www.sciencedirect.com/science/article/pii/S0195670120303376>

Findings: Seven studies met eligibility criteria: one evaluated the effects of heat and chemical interventions applied after mask use on mask performance, and six evaluated interventions applied prior to mask use to enhance antimicrobial properties and/or mask performance. Mask performance and germicidal effects were evaluated with heterogeneous test conditions. Safety outcomes were infrequently evaluated. Mask performance was best preserved with dry heat decontamination. Good germicidal effects were observed in salt-, N-halamine-, and nanoparticle-coated masks. There is limited evidence on the safety or efficacy of surgical mask decontamination. Given the heterogeneous methods used in studies to date, we are unable to draw conclusions on the most efficacious and safe intervention for decontaminating surgical masks.

63. Decontamination and reuse of N95 filtering facemask respirators: a systematic review of the literature. Rodriguez-Martinez CE, Sossa-Briceño MP, Cortés-Luna JA. *Am J Infect Control*. 2020 Jul 8:S0196-6553(20)30690-8. doi: 10.1016/j.ajic.2020.07.004.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7342027/>

Findings: We identified a total of 14 studies reporting on the different decontamination methods that might allow disposable N95 FFRs to be reused, including small-scale energetic methods and disinfecting solutions/spray/wipes. Among these decontamination methods, ultraviolet germicidal irradiation (UVGI) and vaporized hydrogen peroxide (VHP) seem to be the

most promising decontamination methods for N95 FFRs, based on their biocidal efficacy, filtration performance, fitting characteristics, and residual chemical toxicity, as well as other practical aspects such as the equipment required for their implementation and the maximum number of decontamination cycles. Although all the methods for the decontamination and reuse of N95 FFRs have advantages and disadvantages, UVGI and VHP seem to be the most promising methods.

64. **Factors affecting stability and infectivity of SARS-CoV-2.** Chan KH, Sridhar S, Zhang RR, et al. *J Hosp Infect.* 2020 Jul 8:S0195-6701(20)30339-X. doi: 10.1016/j.jhin.2020.07.009. <https://clinowl.com/factors-affecting-stability-and-infectivity-of-sars-cov-2/>
Findings: SARS-CoV-2 was able to retain viability for 3-5 days in dried form or 7 days in solution at room temperature. SARS-CoV-2 could be detected under a wide range of pH conditions from pH4 to pH11 for several days and 1 to 2 days in stool at room temperature but lost 5 logs of infectivity. A variety of commonly used disinfectants and laboratory inactivation procedures were found to reduce viral viability effectively. This study demonstrates the stability of SARS-CoV-2 on environmental surfaces and raises the possibility of faecal-oral transmission. Commonly used fixatives, nucleic acid extraction methods and heat inactivation were found to significantly reduce viral infectivity that could ensure hospital and laboratory safety during the COVID-19 pandemic.
65. **Association between Universal Masking in a Health Care System and SARS-CoV-2 Positivity among Health Care Workers.** Wang X, Ferro EG, Zhou G, et al. *JAMA.* July 14, 2020. doi:10.1001/jama.2020.12897 <https://jamanetwork.com/journals/jama/fullarticle/2768533?resultClick=1>
Findings: Of 9850 tested HCWs, 1271 (12.9%) had positive results for SARS-CoV-2 (median age, 39 years; 73% female; 7.4% physicians or trainees, 26.5% nurses or physician assistants, 17.8% technologists or nursing support, and 48.3% other). During the preintervention period, the SARS-CoV-2 positivity rate increased exponentially from 0% to 21.32%, with a weighted mean increase of 1.16% per day and a case doubling time of 3.6 days (95% CI, 3.0-4.5 days). During the intervention period, the positivity rate decreased linearly from 14.65% to 11.46%, with a weighted mean decline of 0.49% per day and a net slope change of 1.65% (95% CI, 1.13%-2.15%; $P < .001$) more decline per day compared with the preintervention period. Universal masking at MGB was associated with a significantly lower rate of SARS-CoV-2 positivity among HCWs.

Women & Children

66. **Pregnancy and postpartum outcomes in a universally tested population for SARS-CoV-2 in New York City: A prospective cohort study.** Prabhu M, Cagino K, Matthews KC, et al. *BJOG.* 2020 Jul 7. doi: 10.1111/1471-0528.16403. <https://obgyn.onlinelibrary.wiley.com/doi/10.1111/1471-0528.16403>
Findings: Of 675 women admitted for delivery, 10.4% were positive for SARS-CoV-2, of whom 78.6% were asymptomatic. We observed differences in sociodemographics and comorbidities between women with symptomatic vs. asymptomatic vs. no COVID-19. Cesarean delivery rates

were 46.7% in symptomatic COVID-19, 45.5% in asymptomatic COVID-19, and 30.9% without COVID-19 ($p=0.044$). Postpartum complications (fever, hypoxia, readmission) occurred in 12.9% of women with COVID-19 vs 4.5% of women without COVID-19 ($p<0.001$). No woman required mechanical ventilation, and no maternal deaths occurred. Among 71 infants tested, none were positive for SARS-CoV-2. Placental pathology demonstrated increased frequency of fetal vascular malperfusion, indicative of thrombi in fetal vessels, in women with vs. without COVID-19 (48.3% vs 11.3%, $p<0.001$). Among pregnant women with COVID-19 at delivery, we observed increased cesarean delivery rates and increased frequency of maternal complications in the postpartum period. Additionally, intraplacental thrombi may have maternal and fetal implications for COVID-19 infections remote from delivery.

67. **Provision of Pediatric Immunization Services During the COVID-19 Pandemic: an Assessment of Capacity Among Pediatric Immunization Providers Participating in the Vaccines for Children Program - United States, May 2020.** Vogt TM, Zhang F, Banks M, et al. *MMWR Morb Mortal Wkly Rep.* 2020 Jul 10;69(27):859-863. doi: 10.15585/mmwr.mm6927a2.

<https://www.cdc.gov/mmwr/volumes/69/wr/mm6927a2.htm>

Findings: A survey of practices participating in the Vaccines for Children (VFC) program was conducted during May 12-20, 2020. Data were weighted to account for the sampling design; thus, all percentages reported are weighted. Among 1,933 responding practices, 1,727 (89.8%) were currently open; 1,397 (81.1%) of these reported offering immunization services to all of their patients. When asked whether the practice would likely be able to accommodate new patients to assist with provision of immunization services through August, 1,135 (59.1%) respondents answered affirmatively. These results suggest that health care providers appear to have the capacity to deliver routinely recommended childhood vaccines, allowing children to catch up on vaccines that might have been delayed as a result of COVID-19-related effects on the provision of or demand for routine well child care. Health care providers and immunization programs should educate parents on the need to return for well-child and immunization visits or refer patients to other practices, if they are unable to provide services (3).

68. **Pregnancy and COVID-19: a systematic review of maternal, obstetric and neonatal outcomes.**

Trocado V, Silvestre-Machado J, Azevedo L, Miranda A, Nogueira-Silva C. *J Matern Fetal Neonatal Med.* 2020 Jul 7:1-13. doi: 10.1080/14767058.2020.1781809.

<https://www.tandfonline.com/doi/full/10.1080/14767058.2020.1781809?af=R>

Findings: A total of 8 studies involving 95 pregnant women and 51 neonates were included. Overall, the quality was considered good in four studies, moderate in three and poor in one. Among pregnant women, 26% had a history of epidemiological exposure to SARS-CoV-2. The most common symptoms presented were fever (55%), cough (38%) and fatigue (11%). In 50 deliveries, 94% were cesarean sections and 35% were preterm births. Of the 51 neonates, 20% had low birth weight and 1 tested positive for Sars-CoV-2. There was 1 neonatal death, not related to the viral infection, and no cases of severe neonatal asphyxia. The information compiled in this systematic review may help healthcare providers administer the best possible care.

69. **Change in the Incidence of Stillbirth and Preterm Delivery During the COVID-19 Pandemic.** Khalil A, von Dadelszen P, Draycott T, et al. *JAMA*. July 10, 2020. doi:10.1001/jama.2020.12746 https://jamanetwork.com/journals/jama/articlepdf/2768389/jama_khalil_2020_id_200076.pdf
Findings: This study demonstrates an increase in the stillbirth rate during the pandemic. A direct consequence of SARS-CoV-2 infection is possible. Although none of the stillbirths in the pandemic period were among women with COVID-19, surveillance studies in pregnant women reported that as much as 90% of SARS-CoV-2–positive cases were asymptomatic. Alternatively, the increase in stillbirths may have resulted from indirect effects such as reluctance to attend hospital when needed (eg, with reduced fetal movements), fear of contracting infection, or not wanting to add to the National Health Service burden.
70. **Multi-centre Spanish study found no incidences of viral transmission in infants born to mothers with COVID-19.** Marín Gabriel MA, Cuadrado I, Álvarez Fernández B, et al. *Acta Paediatr*. 2020 Jul 10. doi: 10.1111/apa.15474. <https://onlinelibrary.wiley.com/doi/abs/10.1111/apa.15474?af=R>
Findings: In our study over half (52.4%) of the women had a vaginal delivery. The initial clinical symptoms were coughing (66.6%) and fever (59.5%) and one mother died due to thrombo-embolic events. We admitted 37 newborn infants to the neonatal unit (88%) and 28 were then admitted to intermediate care for organisational virus-related reasons. No infants died and no vertical transmission was detected during hospitalisation or follow up. Only six were exclusively breastfed at discharge. There was no evidence of COVID-19 transmission in any of the infants born to COVID-19 mothers and the post discharge advice seemed effective. The measures to avoid transmission appeared to reduce exclusive breastfeeding at discharge.
71. **Intensive care admissions of children with paediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 (PIMS-TS) in the UK: a multicentre observational study.** Davies P, Evans C, Kanthimathinathan HK, et al. *Lancet Child Adolesc Health*. 2020 Jul 9:S2352-4642(20)30215-7. doi: 10.1016/S2352-4642(20)30215-7. [https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642\(20\)30215-7/fulltext](https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(20)30215-7/fulltext)
Findings: During the study period, the rate of PICU admissions for PIMS-TS was at least 11-fold higher than historical trends for similar inflammatory conditions. Clinical presentations and treatments varied. Coronary artery aneurysms appear to be an important complication. Although immediate survival is high, the long-term outcomes of children with PIMS-TS are unknown.
72. **COVID-19 in Children and the Dynamics of Infection in Families.** Posfay-Barbe KM, Wagner N, Gauthey M, et al. *Pediatrics* July 10, 2020, e20201576; DOI: <https://doi.org/10.1542/peds.2020-1576>
<https://pediatrics.aappublications.org/content/early/2020/07/08/peds.2020-1576>
Findings: Since the onset of COVID-19, children have been less affected than adults in terms of severity and frequency, accounting for <2% of the cases. Unlike with other viral respiratory infections, children do not seem to be a major vector of SARS-CoV-2 transmission, with most pediatric cases described inside familial clusters and no documentation of child-to-child or child-to-adult transmission. In our study, In 79% of households, ≥1 adult family member was

suspected or confirmed for COVID-19 before symptom onset in the study child, confirming that children are infected mainly inside familial clusters. Surprisingly, in 33% of households, symptomatic household contacts tested negative despite belonging to a familial cluster with confirmed SARS-CoV-2 cases, suggesting an underreporting of cases. In only 8% of households did a child develop symptoms before any other HHC, which is in line with previous data in which it is shown that children are index cases in <10% of SARS-CoV-2 familial clusters.

73. **Probable Vertical Transmission of SARS-CoV-2 Infection.** Demirjian A, Singh C, Tebruegge M, et al. *Pediatr Infect Dis J.* 2020 Jul 10. doi: 10.1097/INF.0000000000002821.

https://journals.lww.com/pidj/Abstract/9000/Probable_Vertical_Transmission_of_SARS_CoV_2_96098.aspx

Findings: To date, although neonatal infections with SARS-CoV-2 have been described, none of these have been proven to be the result of vertical transmission of SARS-CoV-2. We describe the probable vertical transmission of SARS-CoV-2 in a neonate born to a mother with COVID-19.

GUIDELINES & CONSENSUS STATEMENTS

COVID-19 PICU guidelines: for high- and limited-resource settings. Kache S, Chisti MJ, Gumbo F, et al. *Pediatr Res.* 2020 Jul 7. doi: 10.1038/s41390-020-1053-9.

European consensus recommendations for neonatal and paediatric retrievals of positive or suspected COVID-19 patients. Terheggen U, Heiring C, Kjellberg M, et al. *Pediatr Res.* 2020 Jul 7. doi: 10.1038/s41390-020-1050-z. <https://www.nature.com/articles/s41390-020-1050-z>

FDA / CDC / NIH / WHO Updates

CDC: [Key Considerations for Transferring Patients to Relief Healthcare Facilities when Responding to Community Transmission of COVID-19 in the United States](#)

NIH: [NIH launches clinical trials network to test COVID-19 vaccines and other prevention tools](#)

WHO: [Transmission of SARS-CoV-2: implications for infection prevention precautions](#)

WHO: [Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations: scientific brief, 29 March 2020](#)

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