

COVID-19 Research Watch
June 29, 2020

CLINICAL PRESENTATION AND MANAGEMENT

[Clinical Presentation and Outcomes of Pregnant Women with COVID-19: A Systematic Review and Meta-Analysis¹](#)

This study aimed to better understand the clinical characteristics and outcomes of COVID-19 during pregnancy, the meta-analysis included 24 studies. It found that pregnant women with COVID-19 presented with similar symptoms to that of non-pregnant adults, such as fever, dry cough and sore throat. Morbidity and mortality was lower than what has been seen in other outbreaks such as the flu or the SARS pandemic in 2003. There is very little evidence of vertical transmission, and only 2 neonates tested positive for the virus. Compared to non-infected pregnant women, there was a high rate of preterm birth (37% of included neonates) and 67% were admitted to the NICU. The number of caesarean deliveries was very high, 74%.

[Feasibility and physiological effects of prone positioning in non-intubated patients with acute respiratory failure due to COVID-19 \(PRON-COVID\): a prospective cohort study²](#)

This study enrolled 56 patients from San Gerardo Hospital in Monza, Italy to explore the feasibility and effect of a minimum duration of 3 hours of prone positioning in awake and non-intubated patients with COVID-19 related pneumonia. Of patients for which the prone position was feasible, oxygenation improved from supine to prone positioning (180.5 mmHg vs 285.5 mmHg). Improved oxygenation was maintained in 50% of patients upon resupination, although this was not statistically significant. Within these patients, increased levels of inflammatory markers and shorter times between admission and prone positioning were seen. The authors suggest that prone positioning is both feasible and effective in quickly improving blood oxygenation levels.

[The close relationship between sudden loss of smell and COVID-19³](#)

This cross-sectional observational study assessed the association between sudden loss of smell (SLoS) and SARS-CoV-2 infection. Based on 179 outpatients in Brazil reporting partial or total SLoS who were tested for COVID-19, SLoS showed a high positive predictive value (88.8%) for COVID-19 diagnosis. This result is consistent with multiple studies globally reporting a correlation between olfactory dysfunction and SARS-CoV-2 infection. Though the mechanism of olfaction impairment by COVID-19 is not yet known, the high positive predictive value of SLoS makes it an important symptom to consider for diagnostic and isolation strategies, especially in resource-constrained settings.

[Characteristics Associated With Out-of-Hospital Cardiac Arrests and Resuscitations During the Novel Coronavirus Disease 2019 Pandemic in New York City⁴](#)

A population-based, cross-sectional study was conducted including 5,325 patients 18 years or older who experienced out-of-hospital cardiac arrest and received emergency medical service (EMS) resuscitation during either the COVID-19 period (March 1 – April 25, 2020) or the comparison period (March 1 – April 25, 2019). The 2020 COVID-19 period was found to have 2,635 more patients with out-of-hospital cardiac arrest who received EMS resuscitation and an incidence rate triple that of the comparison period in 2019 (47.5/100,000 vs. 15.9/100,000). Over 90% of the excess cases resulted in out-of-hospital deaths with Black, Hispanic, and Asian patients at an increased risk for COVID-19-associated out-of-hospital cardiac arrests and death. These results--in addition to similar bystander CPR rates, EMS response times, and duration of resuscitation efforts during both periods--highlight the importance of intervening early in the course of COVID-19 infection and ensuring health care access to vulnerable populations during a pandemic.

RISK FACTORS

[Genomewide Association Study of Severe Covid-19 with Respiratory Failures](#)

This genomewide association study was conducted to describe host genetic factors that contribute to severe COVID-19 with respiratory failure. The study identified a novel locus at a chromosome 3p21.31 gene cluster involved in COVID-19 susceptibility, with potential enhancement in patients with respiratory failure. This was supported by findings that demonstrated a higher frequency of the risk allele amongst patients who received mechanical ventilation as well as, amongst patients with severe COVID-19, those who were homozygous for the risk allele tended to be younger. The study also established potential involvement of the ABO blood group system, confirming that blood group O was associated with a lower risk of acquiring COVID-19 (OR 0.65; 95% CI, 0.53 to 0.79) that in non-O blood groups, and blood group A was associated with a higher risk than in non-A blood groups (OR 1.45; 95% CI, 1.20 to 1.75).

[Associations Between Built Environment, Neighborhood Socioeconomic Status, and SARS-CoV-2 Infection Among Pregnant Women in New York City](#)⁶

In this cross-sectional study explored the association between built environments, markers of neighbourhood socioeconomic status (SES) and SARS-CoV-2 prevalence using universal testing in 434 pregnant women admitted to the labor and delivery unit at New York-Presbyterian/Columbia University Irving Medical Center or Allen Hospital between March 22, 2020 and April 21, 2020. Demographic and socioeconomic data from the US Census Bureau's American Community Survey, real estate tax data from New York's Department of City Planning, and building level variables were linked to patients. Women living in buildings with very high assessment values were found to have the lowest probability of infection (8.2%), while those living in neighborhoods with high household memberships had the highest probability of infection (23.9%). Lower odds of infection were found among women living in buildings with more units, in neighbourhoods with higher median incomes, and higher assessed values (interdecile OR of 0.34, 0.32, and 0.29 respectively). Alternatively, higher odds of infection were found among women living in neighbourhoods with high unemployment rates, greater household crowding, and large household membership (interdecile OR of 2.13, 2.27, and 3.16, respectively). This study provides support for the hypothesis that urban environment could be a social determinant of SARS-CoV-2 transmission.

NON-PHARMACEUTICAL INTERVENTIONS

[COVID-19 Outbreak Among College Students After a Spring Break Trip to Mexico — Austin, Texas, March 26–April 5, 2020](#)⁷

College students who went on a spring break trip to Mexico were investigated because several students were infected with COVID-19. Overall, it was found that asymptomatic transmission occurred frequently and led to large outbreaks. Furthermore, several students participated in shared housing and this highlighted the importance of aligning living arrangements, coordinating COVID-19 testing arrangements, and isolating individuals suspected of COVID-19 once schools begin to reopen, which can be effectively done through contact tracing. The report highlights the success and importance of coordinated public health strategies to control outbreaks, including universal testing regardless of symptoms and contact tracing.

[Community Treatment Centers for Isolation of Asymptomatic and Mildly Symptomatic Patients with Coronavirus Disease, South Korea](#)⁸

This study determined the efficacy of Community Treatment Centers (CTCs) for patients with laboratory-confirmed COVID-19, but with mild or no symptoms. In light of hospital bed shortages, the South Korean government converted private dormitories and state-run institutions into community-based isolation facilities. These CTCs were equipped with medical staff and equipment, divided into clean and contaminated sections for staff and patients, respectively, and patients were monitored and evaluated for fevers, respiratory symptoms, oxygen saturation, and more. From March 3, 9, and 11 for each CTC respectively, to March 23, of the 568 patients admitted to the 3 CTCs included in the study, 64.6% of admits were women, their mean age was 36, 75.7% remained asymptomatic at the CTCs with a mean time at the facility of 19.6 days, 19 patients were RT-PCR positive after >28 days from diagnosis, and 12 patients required transfer to hospital. The study concluded that CTCs offer a safe alternative to medical institutions when appropriate clinical triaging and monitoring is offered.

[Effectiveness of isolation, testing, contact tracing, and physical distancing on reducing transmission of SARS-CoV-2 in different settings: a mathematical modelling study](#)⁹

Using data on 40,162 individuals from the BBC Pandemic dataset (collected in 2017-2018 with data on recorded social contacts of each participant), Kucharski et al mathematically modeled individual-level SARS-CoV-2 transmission stratified by setting (household, work, school, or other) to compare the effects of combinations of testing, isolation, contact tracing, and physical distancing on reducing secondary cases. The authors found that in the absence of other measures, achieving an effective R of less than 1 required a high proportion of cases to self-isolate and a high level of successful contact tracing, with a 64% reduction for self-isolation and household quarantine plus manual contact tracing of all contacts. Combining testing and tracing was more effective than both mass testing or self-isolation alone. Depending on the effectiveness of testing, isolating, and contact tracing, adding physical distancing measures to the combined strategy of self-isolation and contact tracing may be required to achieve an effective R lower than 1. The authors also suggest that manual contact tracing (i.e. people who have been met before) may be as effective as

detailed contact tracing in circumstances where gatherings outside of home, school, or work are restricted.

TRANSMISSION PATTERNS

[Population flow drives spatio-temporal distribution of COVID-19 in China](#)¹⁰

Jia et al assessed 11,478,484 counts of movements from mobile phone data of individuals leaving or passing through Wuhan prefecture to 296 regions during January 1st to January 24th 2020 and found that the distribution of population movement out of Wuhan predicted the geographical distribution and frequency of SARS-CoV-2 infections across China; aggregate population movement data outperformed population size, wealth, and distance from the risk source in anticipating outbreaks. Wuhan was quarantined on January 23rd and the authors found that the quarantine led to a 52% reduction in inter-provincial population outflow and a 38% reduction in intra-provincial outflow between January 22nd and January 23rd; further reductions of 94% (inter) and 84% (intra) occurred when comparing January 24th to January 23rd. The authors developed a spatio-temporal “risk source” model to predict the geographic distribution of cases, identify high risk areas, and assess the risk of community transmission; this modeling approach can be repeated in other nations if population movement data is available to predict and assess risk and target resources accordingly.

PATHOPHYSIOLOGY

[Prevalence of SARS-CoV-2 specific neutralising antibodies in blood donors from the Lodi Red Zone in Lombardy, Italy, as at 06 April 2020](#)¹¹

The authors enrolled 390 participants from the Lodi Red Zone - the first lockdown area in Italy established on February 23, 2020 - who donated blood after February 20, 2020. All blood donor enrollees were asymptomatic and an in-house microneutralization assay and RT-PCR were used to test for the presence of neutralizing antibodies (NT-Abs) and SARS-CoV-2 infection, respectively, in paired serum and nasal swab samples between March 18 – April 19. In addition, the presence of NT-Abs was evaluated in a separate group of 40 convalescent COVID-19 patients. Of the 390 blood donors, 23% tested positive for SARS-CoV-2-specific NT-Abs, showing signs of immunological memory to SARS-CoV-2, and 5% tested positive to SARS-CoV-2 with the RT-PCR test. In comparing the results of blood donors to those of the COVID-19 convalescent patients, the authors saw that most NT-Ab-positive blood donors had a lower NT-Ab titer than the COVID-19 convalescent patients, suggesting a connection between severity of symptoms and NT-Ab levels.

DIAGNOSTIC AND ANTIBODY TESTING

[Performance Assessment of SARS-CoV-2 PCR Assays Developed by WHO Referral Laboratories](#)¹²

This study compares the sensitivities and specificities of RT-PCR assays developed for SARS-CoV-2 by five WHO Referral Laboratories--Charité (Germany), HKU (Hong Kong), China CDC (China), US CDC (United States), and Institut Pasteur, Paris (France)--targeting two to three gene regions of SARS-CoV-2, including N (nucleocapsid protein) and RdRp

(RNA-dependent RNA polymerase). N China CDC, N1 US CDC, and RdRP Institut Pasteur (IP2, IP4) were found to be the most sensitive assays for clinical respiratory samples and SARS-CoV-2 cell culture supernatants. All assays were found to be specific except the N Charité and N2 US CDC assays.

ADDITIONAL RESOURCES

[UCSF Library COVID-19 Research and Information Resources](#)
[UCSF Institute for Global Health Sciences COVID-19 Resources](#)
[UC Davis One Health Institute COVID-19 FAQs](#)
[Harvard Viswanath Lab Myths vs Facts](#)

Note on this Document: This document was assembled by graduate and doctoral students attending the University of California, San Francisco with the intent of facilitating the rapid dissemination of information to the global community in order to help during this time. Guntas Padda, James Feng, Sunya Akhter Carina Ashkar, Shivali Joshi, and Sarah Gallalee contributed to these summaries. This work is volunteer based.

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