

Update: July 16, 2020

## COVID-19 DIGEST

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### *From the Cross-Campus Infectious Diseases COVID-19 Task Force*

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## EPIDEMIOLOGY

### LOCAL

Unfortunately, cases and hospitalizations are increasing in San Francisco and statewide. Both at the state and local level, movement restrictions are being re-instituted as a result of these trends. As of today, **4,860 positive cases** and **51 deaths** have been reported in [San Francisco](#). As of July 14, 99 patients were hospitalized across the city, including 13 transfers from outside of San Francisco. [California](#) now reports **354,862 confirmed COVID-19 cases** and **7,364 deaths**, the [positive test rate statewide](#) increased to 7.3% over the last week, and as of July 14 6,786 persons were [hospitalized statewide](#), the highest level since early April.

### NATIONAL

The United States currently has the fastest growing epidemic in the world, with an average of 64,302 cases added per day [over the last 5 days](#). There are now more than **3.5 million reported cases** of COVID-19 and more than **137,000 deaths** across the United States. Cases are [rising](#) in 44 states and [Florida](#) is the current epicenter, where there are over 315,000 cases and 4,677 deaths. Florida has reported >10,000 new cases on 6 out of the last 7 days and on Tuesday 132 deaths were reported and 156 deaths were reported yesterday, the two highest single-day totals. [Hospital capacity](#) is severely strained with 54 hospitals in the state with 0 ICU beds available and another 40 hospitals with less than 10% ICU bed availability. [Hospitals](#) are also at or near capacity in Arizona and Texas, with many hospitals facing shortages of equipment, medications, and staff. In one bright spot, the [CDC](#) reported the results of an investigation of COVID-19 transmission in a hair salon that supports the effectiveness of masks to reduce transmission. Two hairstylists in Missouri were working while symptomatic without knowing they had COVID-19 infection. At this salon, masks were worn by the stylists and clients when they were interacting. None of the 139 clients tested for whom stylists worked on for least 15 minutes became infected. All 4 of stylist A's household contacts (no mask wearing) subsequently became infected.

### GLOBAL

[Worldwide](#) there are currently over **13.5 million** reported cases of COVID-19 and **over 585,000 deaths** and over 7 million cases and almost 300,000 deaths are from [North and South America](#). Chile has the highest cumulative incidence rate (1.7K per 100,000), while outside of the United States, [Brazil](#) is experiencing the most rapid increase in new infections, the greatest number of infections with almost 2 million cases, and over 75,000 deaths. Brazilian president Jair Bolsonaro, who has downplayed the danger of the pandemic and mocked social distancing measures, announced that he had [become infected](#) with COVID-19 on July 7, testing positive after experiencing symptoms.

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## UP TO THE MINUTE DISPATCHES

### **Tracking changes in SARS-CoV-2 spike: evidence that D614G increases infectivity of the COVID-19 virus**

A critical question in the COVID-19 epidemic is that whether this virus will acquire mutations that will enhance its virulence. Compared to other RNA viruses, coronaviruses exhibit relatively low genetic diversity since their viral polymerases have some proofreading function. In this [study](#), dynamic tracking of viral variants revealed that a single

amino acid change in the spike protein of SARS-CoV-2, the G614 variant, arose independently in multiple geographic locations. The G614 variant appeared to have a fitness advantage since (1) within a month of its appearance, it became the predominant virus, (2) pseudotyped virions grew to higher titers, and (3) the upper respiratory tract viral load in G614-infected humans had higher viral titers. The phenotypic consequence of the G614 variant could lead to higher transmission. Disease severity was not increased in patients with G614 variant. Important limitations of this study include the lack of direct cell culture or animal experiments comparing the two SARS-CoV-2 variants and the lack of data as to whether this variant will be insensitive to monoclonal antibodies or vaccines. **Conclusion:** A single amino acid change on the spike protein of SARS-CoV-2 may result in increased infectivity without increase in disease severity. Continued surveillance for spike mutations will be important in understanding disease transmission, pathogenesis, and development of an effective vaccine.

### **Persistent symptoms in patients after acute COVID-19**

While some patients with COVID-19 recover quickly, many have reported symptoms for weeks following the acute illness. A group in Italy sought to [characterize](#) symptoms in patients discharged and PCR negative following hospitalization for COVID-19. They enrolled 143 of 173 eligible patients who were asked to complete a standardized questionnaire and undergo a physical exam. Mean length of hospitalization was 13.5 days and 15% received non-invasive ventilation and 5% invasive ventilation. Patients were assessed a mean of 60 days after illness onset. 87% reported persistent symptoms with 55% reporting  $\geq 3$  symptoms. Most common symptoms were fatigue (53%), dyspnea (43%), joint pain (27%), and chest pain (22%). None reported ongoing fever and  $< 20\%$  reported cough. Limitations of this study is that it single-center and there was no control group. **Conclusion:** Many patients suffer from persistent symptoms following acute COVID-19 infection which includes fatigue, dyspnea, joint pain, and chest pain. Outpatient providers should be aware of these common symptoms and further studies are needed to identify the cause and strategies to manage and prevent these symptoms.

### **Prevalence of SARS-CoV-2 in Spain: a nationwide, population-based seroepidemiological study**

Researchers in Spain [report](#) findings of a nationwide population-based study to estimate the seroprevalence of SARS-CoV-2. This is the largest national serosurvey, designed to be representative at the national and regional levels and enrolling over 60,000 participants in each round. Presence of antibodies (IgG) was determined using both a point of care assay (POC) and a chemiluminescent immunoassay. The first round was conducted in late April 2020. The overall seroprevalence was 5% by POC and 4.6% by immunoassay but ranged from  $>10\%$  around Madrid to  $<3\%$  in coastal regions. Trends towards lower seroprevalence in children were observed. No differences were observed by sex or socioeconomic status. Seroprevalence was 17% among individuals who reported COVID-19 symptoms. Approximately 1/3 of seropositive individuals reported no symptoms. Two additional rounds of serosurvey were conducted 3 and 6 weeks apart, obtaining samples from many of the same individuals. Researchers [found](#) (Spanish) that among participants who were seronegative in the first round, 1.7% seroconverted by the third round. However, 14% of participants who were seropositive in the first round tested negative in the third round and 20% of asymptomatic patients became seronegative. **Conclusion:** Despite high morbidity and mortality in certain areas (like Madrid), most of the Spanish population remains susceptible to SARS-CoV-2. A significant number of seropositive patients became seronegative during a relatively short period. Further understanding of the significance of that finding on immunity needs exploration.

### **COVID-19 Cases and Deaths in State and Federal Prisons**

Approximately 1 out of 150 in the US are currently incarcerated and COVID-19 outbreaks have [disproportionally affected](#) those living in prisons and jails because of close confinement, limited access to PPE, and elevated burden of comorbidities increasing risk of severe COVID-19. Researchers [analyzed](#) publicly available data on COVID-19 cases from federal and state departments of corrections (did not include data from jails and detention facilities). They identified 42,107 COVID-19 cases and 510 COVID-19 associated deaths. The COVID-19 case rate was 587/100,000 prisons and jails residents, 5.5 times higher than the US population. The COVID-19 death rate in this population was 39/100,000, which is 3 times higher than that would be expected if the age and sex distribution in correctional facilities mirrored the general US population. Limitations of this study are that cases are likely underestimated since correctional facilities are not required to publicly report data, have delayed access to testing, and residents may be less likely to disclose symptoms or

consent to testing due to punitive measures associated with medical isolation and quarantine. **Conclusion:** Residents of US correctional facilities are at substantially higher risk of COVID-19 acquisition and death compared to the general US population. Enhanced strategies are needed to protect and provide care for patients in correctional facilities. [Experts at UCSF](#) are working to provide guidance for the care of patients with COVID-19 at San Quentin State Prison and other correctional facilities.

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## FAQ

### 1. Can adults get Multisystem Inflammatory Syndrome from COVID-19?

COVID-19 associated Multisystem Inflammatory Syndrome has been previously reported in children (MIS-C). [CDC](#) and [WHO](#) case definitions include only patients aged less than 21 years or 19 years respectively. Two recent case reports ([Lancet](#), [Am J Emerg Med](#)), both from New York, describe a similar clinical syndrome occurring in adults with laboratory confirmed (PCR) COVID-19 infection. Both patients were previously healthy adults in their 30s and 40s presenting with fevers and multisystem features of [Kawasaki disease](#) including non-exudative conjunctivitis, cracked lips, diffuse rash and cervical lymphadenopathy. Both patients presented with prominent GI symptoms but lacked significant respiratory symptoms. **Conclusion:** These reports suggest that the multisystem inflammatory syndrome previously described in children may also occur rarely in adults. Future research is needed to further delineate the pathophysiology and epidemiology of these conditions and improve current approaches to diagnosis and treatment.

### 2. Is airborne transmission of COVID-19 an important mode of spread?

Debate continues around the extent to which SARS-CoV-2 is transmitted via respiratory droplets vs. aerosols, highlighted in [recent commentaries](#) and a scientific [brief](#) released by WHO. Although experimental data that show that speaking and coughing can produce a mixture of both, the balance of evidence to date continues to suggest droplet transmission as the main mode of spread. An exception may be prolonged exposure to an infected person in a poorly ventilated space that allows otherwise insignificant amounts of virus-laden aerosols to accumulate. This risk is minimized in healthcare facilities by ventilation standards. WHO continues to recommend droplet plus contact precautions (outside of aerosol-generating procedures) for suspected and confirmed COVID-19 patients as part of a comprehensive strategy that includes universal masking and physical distancing. **Conclusion:** Droplet is the primary mode of transmission of COVID-19; in healthcare settings, outside aerosol generating procedures, the impact of aerosol on spread of COVID-19 is likely minimal.

### 3. Is a different approach to ventilatory management of COVID-19 ARDS warranted?

A few publications have described clinical features in patients with ARDS from COVID-19 that appear to have physiologic differences from classical ARDS, particularly in terms of a phenotype of severe hypoxemia but minimal alterations in respiratory compliance. This resulted in controversial recommendations to change ventilator management strategies in patients with ARDS from COVID-19. However, a recent scholarly [review](#) of reports from several major centers in the US, China and Europe indicates that, on average, the respiratory compliance (tidal volume/plateau airway pressure-the level of PEEP) and the severity of hypoxemia (PaO<sub>2</sub>/FiO<sub>2</sub>) in COVID-19 ARDS patients is similar to classical ARDS. While there is heterogeneity around these mean values, on balance the differences from classical ARDS are minimal. Thus, the authors recommend adherence to an [evidence-based approach](#) to ventilatory management of COVID-19 ARDS, including lung protective ventilation with a tidal volume of 6 ml/kg predicted body weight, a plateau airway pressure < 30 cmH<sub>2</sub>O. PEEP should be individualized to maintain oxygen delivery and reduce the risk of ventilator-associated lung injury. As in classical ARDS, prone positioning is [recommended](#) in COVID-19 ARDS mechanically ventilated patients with moderate to severe ARDS (PaO<sub>2</sub>/FiO<sub>2</sub> < 150 mmHg). **Conclusion:** Intensivists should approach ventilatory management the same in COVID-19 associated ARDS as with ARDS in other conditions.

#### 4. Can neonates develop symptoms from COVID-19 infection?

Based on the current [literature](#), most neonates born to mothers with COVID-19 infection do not develop symptoms/sequelae. A limited number of [reports](#) demonstrate that neonates can become infected and develop symptoms. Symptomatic early-onset COVID-19 infection has been described in a case series of 33 neonates born to women with COVID-19, 3 infants were COVID-19 infected. The symptoms of the infected neonates included fever, lethargy, vomiting, pneumonia, leukocytosis, lymphopenia, and thrombocytopenia. Another recent case [report](#) of a late pre-term baby born to a symptomatic COVID-19 positive mother was consistent with vertical transmission given positive COVID-19 PCRs from the placenta/amniotic fluid/vaginal fluid and from the baby's blood/ NP swab; this baby developed neurologic symptoms on day of life #3 and had CNS radiographic abnormalities. There have also been [reports](#) of neonates/young infants presenting with late onset sepsis, fever/hypothermia, lethargy, feeding difficulty, pneumonia/ respiratory failure, hypoglycemia, and leukopenia, neutropenia, thrombocytosis. **Conclusion:** Although uncommon, neonates can develop symptomatic COVID-19. More studies are needed to further establish how common COVID-19 is in neonates and what symptoms are most common.

## Highlights from the COVID-19 International Conference by Course Co-Chair Monica Gandhi, MD



*From the editors: The first international COVID-19 Conference occurred last week. Dr. Monica Gandhi from UCSF was one of the co-chairs of this historic meeting. We asked Dr. Gandhi to share with readers some background and highlights of the conference. She shares her perspectives below.*



Monica Gandhi, MD, MPH - AIDS 2020 Co-chair

The International AIDS Conferences, held every other year, are the largest AIDS conferences held globally, usually hosting 25,000 delegates. This year, AIDS 2020 was to be held in San Francisco/Oakland from July 6-10, but it had to be converted to a virtual meeting due to COVID-19. Since a virtual platform was being built anyway and we were smack-dab in the middle of another raging viral pandemic, we decided to hold the first abstract-driven COVID-19 global conference ever held on the last day of AIDS 2020 Virtual. I served as the scientific co-chair of the meeting, along with Drs. Chris Beyrer and Anton Pozniak.

COVID-19 at IAS on July 10, 2020 spanned 20 hours and featured an opening by the Executive Director of the World Health Organization (Dr. Tedros Adhanom Ghebreyesus) and then three plenary sessions by Drs. Anthony Fauci, Ambassador Deborah Birx and Professor Salim Abdool Karim from South Africa. The conference also featured three symposia on the Effects of COVID-19 Beyond Health (featuring UCSF's own Dr. Sheri Weiser talking on the impact of COVID-19 on food insecurity worldwide); the Impact of COVID-19 in the Health Sector (with a notable talk by Dr. LeRon Nelson on disparities with COVID-19 in racial/ethnic minorities in the U.S.); and a session on Countries Policies and Practices, which was introduced by Dr. Peter Piot and featured talks from Canada, South Korea, and India.

There were a number of scientific abstracts presented at the meeting and I will tell you highlights the four we selected to feature in our press conference. **The first was a comprehensive look at 31 pregnant women and newborns** where real-time PCR was performed to evaluate SARS-CoV-2 detection on maternal and newborn specimens. SARS-CoV-2 was found in the placenta, umbilical cord blood, and in breastmilk, suggesting vertical transmission of the virus is possible. **The second found that sofosbuvir and daclatasvir led to better 14-day recovery rates and a shorter hospital stays in a small number of patients (n=66) with SARS-CoV-2**, which was hypothesis generating for the use of hepatitis C treatments for COVID-19. **The third was an RCT of remdesivir for severe COVID-19 infection which found that lower oxygen requirement, age <65 years, black race, ex-Italy regions, and no concomitant biologic medication were associated with higher rates of clinical improvement.** The final media release was on **Drs. Carina Marquez, Gabriel Chamie and Diane Havlir's Unidos en Salud study in the Mission District which tested nearly 4000 people over 4 days**, showing that 95% of those who tested PCR-positive for SARS-CoV-2 in the district were Latinx individuals. The new findings shared at last week's meeting was that 53% of patients were asymptomatic at the time of testing, and 42% remained so. Moreover, viral loads of SARS-CoV-2 as estimated by PCR were as high among those who were asymptomatic early on in infection as among symptomatic individuals. Third, based on phylogenetics, the study found multiple SARS-CoV-2 strains in the census district, suggestive of multiple introductions over time acquired from across the city.

The conference also featured a short plea from Dr. Jane Goodall entitled "Hope for Change" where she outlined that recent pandemics (HIV, SARS, MERS, SARS-CoV-2) were all a result of our unfair treatment of animals and that we must change our practices towards animals and the earth to live in harmony on our planet. The conference closed out with Bill Gates providing an outline for the way forward through the pandemic and António Guterres, UNAIDS Secretary General providing closing remarks.

All presentations from the Virtual COVID-19 Conference are available for free on [covid19.aids2020.org](https://covid19.aids2020.org)

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**UCSF Hospital Epidemiology and Infection Prevention COVID-19 webpage:**

<https://infectioncontrol.ucsfmedicalcenter.org/ucsf-health-covid-19-resources>

**San Francisco DPH link:** <https://www.sfdcp.org/infectious-diseases-a-to-z/coronavirus-2019-novel-coronavirus/>

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