

## COVID-19 DIGEST

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

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## EPIDEMIOLOGY

### LOCAL

As of today there are **73,022 confirmed COVID-19 cases** and **2,970 deaths** [in California](#). [In San Francisco](#) there are 1,999 cases and 35 deaths. Governor Newsom announced [additional easing of restrictions](#) allowing malls and some offices to re-open and both Marin and San Francisco counties will start allowing curbside pickup for non-essential businesses to resume on Friday. LA County announced stay-at-home orders would most likely be extended [through July](#).

### NATIONAL

In the [United States](#), over **1.39 million cases** and over **84,313 deaths** from COVID-19 have been reported. [The Navajo Nation](#) currently reports the highest number of cases per capita in the United States; 3,122 cases, or approximately 1,798 cases per 100,000 population have been reported in the Navajo Nation (for comparison, New York reports 1,751 cases per 100,000 people and New Jersey reports 1,560 cases per 100,000). The Navajo Nation is particularly vulnerable to the COVID-19 pandemic; over 30% of households [lack running water](#) making frequent hand-washing and hygiene more challenging, high rates of [diabetes](#) in the Navajo Nation increase the risk for severe infection, and a [high frequency of intergenerational households](#) increases the risk among the elderly and makes it difficult for sick individuals to isolate. UCSF sent a team of 14 nurses and 7 doctors to the Navajo Nation on April 22 and [Doctors Without Borders](#) also sent a team in mid-April to help with the crisis.

### GLOBAL

[Worldwide](#) there are currently over **4.38 million reported cases of COVID-19** and **298,000 deaths**. The COVID-19 pandemic is continuing to evolve in [Africa](#), where currently over 70,000 cases and 2,000 deaths are reported. The week that ended May 10 saw a [56% increase](#) in reported cases across the continent. South Africa reports the highest number of cases with over 11,300 cases. The official case count is limited by lack of access to diagnostics, which the head of the Africa CDC describes as the [Achilles heel](#) of Africa's COVID response. The death toll includes many prominent [figures in government](#)

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## UP TO THE MINUTE DISPATCHES

### Triple therapy for COVID

A [Hong Kong study](#) evaluated triple therapy with lopinavir/ritonavir (Kaletra), ribavirin and interferon-beta-1b (IFN-beta) in an open label, randomized controlled trial of 127 COVID-19 patients with mild/moderate disease. IFN-beta was only given to those with < 7 days of symptoms, to avoid possible pro-inflammatory effect later in disease course. Kaletra/ribavirin +/- IFN-beta had a significantly shorter time to negative nasopharyngeal PCR (7 vs 12 days) and time to clinical improvement. However, these improvements were *only* seen in the 52 who receive triple therapy (within 7 days of symptoms) and *not* in the 34 receiving Kaletra/ribavirin alone. **Conclusion:** Interferon-beta-1b may have a role in treating COVID-19, particularly early after disease onset and with limited disease. The contribution of Kaletra/ribavirin to the clinical and virologic improvement in this series is unclear. Generalizability is limited given this group had mild disease (no deaths, 18% requiring oxygen support of some kind).

## **Largest cohort of COVID-19 cases in preprint: Poverty, not underlying medical conditions, is the concern for racial/ethnic minorities**

In the [largest study examining COVID-19 outcomes](#) to date in any setting, medical records of 17.4 million adults in the United Kingdom via the National Health Service (NHS) were analyzed to assess for factors associated with death from COVID-19. The authors identified 5,683 COVID-19 hospital deaths between February 1 and April 25th, 2020 in the UK. As in previous studies, death was associated with male sex, older age, and uncontrolled diabetes. However, this study found that persons of Asian and Black ethnic origin in the UK were at higher risk of death compared to white individuals, even when controlling for underlying medical conditions and poverty. Poverty was found to be an independent risk factor for death that persisted after controlling for underlying medical conditions. **Conclusion:** This study from NHS records in the UK is the largest study of COVID-19 cases presented to date. The study provides counter-evidence to the popular hypothesis in the US that higher rates of death among racial/ethnic minorities may be due to a higher prevalence of underlying and predisposing medical conditions and puts a greater emphasis on poverty. Authors speculate that Asians and Blacks in the UK were more likely to be in "front-line" essential positions and to have a higher household density.

## **Distinguishing characteristics of COVID-19 respiratory disease compared to other respiratory illnesses**

While a number of studies have described the clinical characteristics of patients with COVID-19 disease, this retrospective study (pre-print, not peer reviewed) from UCSF authors, compares the clinical characteristics, diagnostics, and outcomes of patients hospitalized with COVID-19 to other acute respiratory illnesses. Nasal swabs obtained for all patients presenting with acute respiratory illness to a tertiary academic medical center emergency department in San Francisco, CA from February 3, 2020 to March 31, 2020 were tested for SARS-CoV-2 by RT-PCR and metagenomic next generation sequencing. Of the 316 patients, 10% tested positive for SARS-CoV-2 whereas 16% of the patients tested positive for another respiratory illness. There were no documented co-infections. Patients with SARS-CoV-2 differed from those with other documented respiratory infections on the basis of (1) longer symptom duration (7 vs 3 days), (2) the presence of fever, fatigue, myalgias, lymphopenia, bilateral opacities on initial chest radiograph, (3) the rate (79% vs 56%) and duration of hospitalization (10.7 vs 4.7 days), and (4) the development of ARDS (23% vs 3%). In contrast, most other co-morbidities, lab results, treatment, and outcomes did not differ by SARS-CoV-2 status. **Conclusion:** In comparison to others admitted with suspected respiratory infection, those with COVID-19 often have longer duration of symptoms upon admission, may be more ill, have bilateral opacities, and require longer hospitalization.

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## **FAQ**

### **1. Which children are getting severe COVID-19 in North America how are their outcomes?**

An initial [report](#) from the CDC on April 6 suggested severe COVID-19 was rare in children. Since then, the pandemic has surged in many areas of the US raising questions about additional impact on children. A new [study](#) described 48 children with COVID-19 admitted to 14 medical centers; median (IQR) age was 12 (4-17 years), 52% were male, and 83% had significant comorbidities (40% had a long-term dependence on technological support (including tracheostomy) associated with developmental delay and/or genetic anomalies, 23% immunosuppressed, 15% obesity, 8% diabetes). 81% required respiratory support beyond their baseline and 38% required mechanical ventilatory support with only 2 (4%) deaths, but 9 (19%) remained critically ill at the time of publication. **Conclusion:** Severe disease can occur in children but predominates in those with significant comorbid conditions. [New reports](#) about children with Pediatric Multisystem Inflammatory Syndrome raise concern that cases of a severe post-infectious inflammatory condition may follow the acute phase in some patients.

### **2. Can SARS-CoV-2 be found in semen?**

A recent [study](#) from China tested for the presence of SARS-CoV-2 in the semen of 38 men with confirmed COVID-19. This investigation found that 4 of 15 (26.7%) men in the "acute stage" of illness tested positive, in contrast to 2 of 23 (8.7%) who had "clinically recovered." These patients were tested at a median of 10.5 days following symptom onset (range 6-16 days). Quantitative data on virus nor culture data was provided. Other small [studies](#) have not been able

to confirm the presence of SARS-CoV-2 RNA in semen of patients with COVID-19. **Conclusion:** Genetic material from diverse viruses has been [detected](#) in semen, yet for many of these viruses it is unclear that this poses a significant transmission risk. There are currently insufficient data that semen is capable of spreading COVID-19.

### 3. Is obesity a risk factor for severe COVID-19?

Obesity has been identified as a risk factor for severe illness in other respiratory viral infections such as [2009 Influenza A \(H1N1\)](#). A retrospective analysis of 3,615 patients with COVID-19 [who presented to NYU-Langone](#), identified obesity as a risk factor for severe disease requiring admission to acute and intensive care. For patients <60 years of age, those with a BMI of 30-35 were 2.0 times more likely and those with a BMI of  $\geq 35$  were 3.6 times more likely to be admitted to the ICU, compared to those with a BMI <30. A new [study](#) examined 265 patients with COVID-19 admitted to ICUs at 6 US academic medical centers also found that younger patients were more likely to be obese. Amongst these patients in the ICU, the median BMI was 29.3 kg/m<sup>2</sup>, with only 25% of individuals having a BMI of less than 26 kg/m<sup>2</sup>, and 25% exceeding a BMI of 34.7 kg/m<sup>2</sup>. **Conclusion:** Obesity appears to be a significant risk factor for severe COVID-19 disease, particularly among younger patients.

### 4. What is our updated understanding of the thrombotic complications of COVID-19?

As described previously in the Digest, reports of thrombotic complications in patients with COVID-19 are common. Specialty societies have [recommended](#) that all hospitalized patients with COVID-19 are given thromboprophylaxis but the utility of therapeutic anticoagulation is unknown. A recent [retrospective study](#) evaluated the association between therapeutic anticoagulation (AC) and survival in 2,773 hospitalized patients with COVID-19 in New York City. 28% of patients received treatment-dose AC although the indications were not reported. The main finding of the study was that the duration of AC was associated with a reduced risk of mortality (adjusted HR of 0.86 per day). This seemed to be particularly true for patients who required mechanical ventilation. There was no difference in bleeding events (2% without AC vs. 3% with AC). **Conclusion:** There is significant interest in whether therapeutic AC would be of benefit in severe COVID-19, but observational studies have many limitations and concern remains about the risk of bleeding. Prospective, randomized control trials are needed.

## FRONTLINE: Interviews with Leaders Responding to the COVID-19 Epidemic

*An interview with Carina Marquez, MD, MPH and Vivek Jain, MD on the UCSF-Zuckerberg San Francisco General response to the health inequities highlighted by COVID-19*



*Dr. Carina Marquez is a lead investigator of the [Unidos en Salud](#) (United in Health) study, the Director of Diversity of the UCSF Infectious Diseases Fellowship Program and the Associate Director for Equity in the UCSF CFAR*



*Dr. Vivek Jain is the director of the ZSFG Infectious Diseases Clinic and co-director of the ZSFG Infection Control & Prevention Team*

**Can you describe the process of how you conducted your recent study on COVID-19 prevalence in San Francisco?**

**Dr. Marquez:** Early on we partnered with the Latino Task Force for COVID-19, a group of Latino leaders and non-profits working to meet the needs of the Latino community in San Francisco. The leadership of the Latino Task Force was crucial to all aspects of the study, from community mobilization to the clinical response. For community mobilization, hundreds of volunteers canvassed the area and community groups and media organizations offered radio and covered the event extensively. The demand for testing was high; over 4 days 4,160 people came to the 'pop-up' test sites in schools and parks in the Mission district. Participants received COVID-19 PCR tests and antibody tests. This effort did not just stop at the testing, we also sought to evaluate a novel community-based 'test to care' program. In addition to the SF standard (SFDPH case-investigation and contact tracing) PCR positive participants received services from the (1) Clinical Response Team-a hospital-based multidisciplinary team that called patients to disclose results, provided wellness checks, and linked patients to primary care and the (2) Community Wellness team- a community-based team that provided education and support for isolation and quarantine.

**We have been reading reports around the country about inequities in who is getting COVID-19. Were similar results seen in San Francisco?**

**Dr. Marquez:** Yes. The results of this community-based study show stark disparities and are certainly a call to action. We found that over 2 percent of persons tested, that live or work in a Mission census tract, are PCR+. COVID-19 infections are not distributed evenly within the community and low-wage LatinX community members ,who are unable to work from home, are most highly affected.

**We have heard from Dr. Marquez about infection in the community, can you describe how you have studied hospitalized patients with COVID-19 at ZSFG?**

**Dr. Jain:** We have kept systematic track of all patients admitted to the hospital with COVID infection and collected information on their clinical characteristics as well as their microbiologic and radiologic findings. We also get information from a daily morning clinical meeting we run at which all hospital teams taking care of COVID-19 patients come and present updates on new and pre-existing patients. This has been a great group learning forum to hear about issues ranging from clinical presentations to the many logistic and operational aspects of caring for our patients, and has greatly informed our findings.

**Were the inequities in the community in terms of who are getting infected also seen in who gets severe disease with COVID-19?**

**Dr. Jain:** Yes, overall 81% of our first 103 inpatients have been Latinx, which is starkly disproportionate to the approximate 32% of our patient base who is Latinx. Further, among the 33 patients of the first 103 who needed ICU care, 76% have been Latinx, indicating that the disparities we have seen are present across the entire spectrum of disease from mild to medium to severe.

**What strategies do you think would be most helpful in the short-term to address these inequities in COVID-19 in San Francisco?**

**Dr. Marquez:** We need to continue to improve testing equity by expanding testing reach to populations most affected. I also think we need to expand our services for those who test positive for COVID-19. We hope that our 'test to care' model will be scaled up. Pairing a clinical, community, and DPH response was helpful in optimizing peoples ability to safely self-isolate, to get the services they needed like food delivery, and to link to medical care. Lastly, two weeks of isolation and quarantine can take a great financial toll on people and legislation to ensure wage replacement will be very important.

**Dr. Jain:** The city's department of public health is increasing resources to the Latinx community, but more needs to be done, and on an accelerated timeline. We need to provide more locations and options for quick COVID-19 testing, and when a patient is diagnosed we need to provide strong household support to help individuals isolate, provide alternate housing locations for people living in high density arrangements, provide food and income support to help people shelter in place and/or maintain isolation/quarantine, and we need to help people link to care and know that

hospitals are here for them should their illness worsen. We must also ensure that the best language concordant care is available at all hospitals and that rightful concerns around immigration status or other legal questions do not create fear, anxiety or other barriers to seeking care.

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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.sfcdcp.org/infectious-diseases-a-to-z/coronavirus-2019-novel-coronavirus/>

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