VIEWPOINT

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JAMA Network Open and COVID-19

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, which has concentrated worldwide scientific power in an unprecedented manner, has altered the global scientific landscape in many ways. The scale of intellectual and financial investment and the rapidity with which research has been moving since the onset of the pandemic are mind-boggling. The attention of nearly 8 billion people and their governments is focused on understanding the epidemiology and biology of this perilous virus and on finding ways to prevent and treat the infection. Since January 2020, more than 130 000 articles about SARS-CoV-2 and coronavirus disease 2019 (COVID-19) have been published. This vast amount of research, coupled with the urgency for dissemination of results has placed enormous pressure on scientific journals to rapidly assess a massive volume of submitted manuscripts, expedite peer review, and publish results quickly.

In many respects, JAMA Network Open has been ideally positioned to respond to these circumstances. From its inception, JAMA Network Open was designed as an international journal. Even before the pandemic, more than 40% of its submissions originated from outside the US, with Chinese authors leading all other countries in manuscript submissions. JAMA Network Open publishes 5 days per week in an effort to facilitate rapid dissemination of research, which is especially critical during this current pandemic. JAMA Network Open is projected to publish 1350 studies in 2020. The number of submissions has increased more than 200% since last year; approximately half of these new manuscripts are related to COVID-19 research and commentary. Despite the high volume of submissions, currently more than 900 per month, the editorial team has not wavered from its commitment to rigorous editorial evaluation and external peer review, including statistical review prior to acceptance, and careful manuscript editing after acceptance. In addition, JAMA Network Open is an entirely open access journal with all published articles instantly available to the world. Many other journals, including all of those in the JAMA Network, have made their COVID-19–related articles free public access, but this simply serves to emphasize that during a pandemic when the science is critical, open access is essential.

As a general medical journal, all articles published in JAMA Network Open describe human-related studies that address potential improvements in the rapidly evolving understanding of how to prevent, diagnose, and treat COVID-19 infections.

Prevention

Due to systemic racism, many Black people in the US live with inadequate access to high-quality medical care. The Black population, burdened with an excess of serious chronic medical conditions, has a high rate of infection and critical illness from SARS-CoV-2. Adhikari et al found that poorer counties in the US with a high proportion of non-White residents had an infection rate nearly 8-fold greater (adjusted infection rate of 664 vs 85 per 100 000) and mortality that was 9-fold higher (adjusted infection rate of 30.7 vs 3 per 100 000) than in counties with predominantly White populations. Public health prevention programs should prioritize these and other at-risk communities to prevent poor clinical outcomes.

One of the most effective, if economically challenging, nonpharmaceutical interventions appears to be stay-at-home orders. In a JAMA Network Open study that compared border counties in Iowa without a stay-at-home order with those in Illinois with such an order, Iowa had 217 excess cases of COVID-19 per 100 000 after 1 month, representing 30.4% of the 716 total cases in those Iowa counties by that date. There continues to be a serious gap in knowledge and use of protective behaviors related to COVID-19, and public education campaigns appear to exert only modest effects.

Diagnosis of COVID

Significant advances in the diagnosis of SARS-CoV-2 infection have been made recently. JAMA Network Open published an important study on the pooling of polymerase chain reaction samples as a method for efficiently increasing the number of people who can be tested for the virus. Sample pooling has been practiced since at least World War II, when samples from military recruits were combined and tested for syphilis. If the pooled sample was negative, then all recruits were considered negative; if the pooled sample was positive, each individual in the pool was retested to determine which specific recruits were infected. In a recent JAMA Network Open article, Cherif and colleagues modeled the optimal size of a COVID-19 testing pool, based on the prevalence of the disease in the community and test sensitivity. They estimated that 84% fewer individual tests would need to be performed if pooled samples of 13 patients were used, assuming a COVID-19 test sensitivity of 70% in a community with a prevalence of SARS-CoV-2 of 1%. Pooled sample testing is now being widely discussed as a way forward, especially as testing capacity is currently strained due to widespread COVID-19 infection in the US. The US Food and Drug Administration (FDA) has now approved pooled testing, although pools are limited to 5 individuals using existing test methodologies.

Diagnostic testing and contact tracing are core components of most COVID-19 containment strategies. However, screening of asymptomatic people may also be useful in COVID-19 prevention. For example, some US residential colleges have designed prevention strategies that include periodic testing of asymptomatic students and instructors. Paltiel and colleagues examined different strategies for testing at colleges and universities using a standard susceptible-exposed-infectious-recovered (SEIR) epidemiological model linked to a cost-effectiveness analysis. They found that
assuming an effective reproduction number of 2.5, screening students every 2 days using a COVID-19 PCR test with a sensitivity of 70% was estimated to cost $470 per student per semester. Across all scenarios, testing frequency was found to be more important than the sensitivity of the tests modeled in reducing the number of infections that occur in a population. Frequent screening may be an important component of "return-to-learn" bundles that residential college administrators should consider.

**Treatment**

Beyond diagnosis and prevention, identifying treatments for patients with COVID-19 has been a focus for scientists around the world. Many of these initial studies focused on repurposing existing therapies. In one of the few randomized clinical trials conducted to date, Borba and coinvestigators\(^1\) from Brazil found that among 81 hospitalized patients, high-dose chloroquine, when combined with azithromycin and oseltamivir, resulted in higher mortality than low-dose chloroquine (39% vs 15%). This important study contributed to the removal of chloroquine and hydroxychloroquine from many of the world's COVID-19 treatment guidelines. Another JAMA Network Open randomized clinical trial\(^2\) of 105 patients hospitalized with COVID-19 in Greece found a small but statistically significant improvement in time to clinical deterioration with use of colchicine. However, the authors appropriately cautioned that these findings need to be validated.

Successful treatment of COVID-19 requires a stable and resilient health care system. Thus, it has been concerning that the pandemic has negatively affected the physical and mental well-being of health care workers. One of the earliest surveys\(^3\) involved 1257 health care workers in 34 hospitals in China. It found that among these health care workers, 50.4% had symptoms of depression, 44.6% had anxiety, 34.0% had insomnia, and 71.5% experienced varying degrees of distress. Reassuringly, a report from the Netherlands\(^4\) found that among 86 health care workers with SARS-CoV-2 infection, most had mild disease; 53% reported fever during the course of illness, and 12% reported feeling feverish without having measured their temperature; 93% met a case definition of fever and/or coughing and/or shortness of breath; only 2 of these health care workers required hospital admission and neither developed critical illness. When combined with other studies, it appears that appropriate personal protective equipment, if available, protects health care workers who would otherwise be at high risk of contracting COVID-19 infection. However, substantial risks for first-responder infections has been described. New York City, by May 31, 2020, 4408 (40.7%) of 4408 emergency medical service workers and 3873 (34.5%) of 11 230 firefighters had been on medical leave for suspected or confirmed COVID-19; 66 of these first responders were hospitalized and 4 died.\(^9\)

Given the lack of effective drugs to prevent COVID-19, other interventions are essential. A modeling study from Riediker and Tsai\(^10\) in Switzerland found that in small poorly ventilated rooms, simulated patients with high viral loads can produce airborne microplet emissions containing very high SARS-CoV-2 concentrations with frequent coughing. This study suggests mask wearing and improved ventilation may be helpful in lowering the risk of COVID-19 transmission. However, face covering effectiveness has been limited by problems with adherence, which in the US appears to be a politically charged issue.

Although many have developed a justified skepticism of mathematical models based on results that were flawed early in the epidemic, these models are becoming more accurate and useful as data have become available from around the world. JAMA Network Open has published studies exploring a range of potential scenarios regarding COVID-19 spread.

It has been remarkable to witness the exponential amount of scholarship that has emerged with the COVID-19 pandemic. Along with the 12 other journals in the JAMA Network, and many high caliber international medical journals, JAMA Network Open has played an important role in advancing current understanding of the COVID-19 pandemic. As of August 21, 2020, articles related to COVID-19 published in JAMA Network Open have attracted nearly 1.5 million views. As the pandemic progresses and hopefully, as effective means of prevention and treatment become available, JAMA Network Open will continue to seek and publish research that supports the work of clinicians, health care delivery systems, and governmental institutions. In addition, JAMA Network Open will continue to provide leadership in defining the role for open access publishing that will extend long after this pandemic subsides.

**REFERENCES**


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