

The COVID-19 Stress Test: Results and Recommendations

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The stress test has been a mainstay in medicine for almost a century, aiding in the assessment of patients suspected of having ischemic heart disease. If a patient fails a stress test, such as by having chest pain, shortness of breath, changes in blood pressure, or a heart arrhythmia, then some form of treatment may be prescribed.¹ In March 2020, our society was confronted by a different type of stress test: The COVID-19 pandemic. The global pandemic stressed not only our public health systems, but also nearly every other system in society, ranging from our health care system to our global economic system. In the past 3 years, we have learned a lot about how each system—and society in general—responded to this COVID stress test. In this commentary, I reflect on the results of this stress test, including some notable successes and abysmal failures, and conclude with recommendations for changes for when—not if—the next pandemic comes.

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STRESS TEST RESULTS: PUBLIC HEALTH, HEALTH CARE, AND BIOMEDICAL RESEARCH

The COVID-19 pandemic stressed the public health system more than ever before.² Never had the entire public health system been called into action to respond to a public

health crisis. Workers at all levels of government—from the Centers for Disease Control and Prevention (CDC) to state and local health departments—were mobilized to answer questions, test people with symptoms, track cases, make recommendations for isolation and quarantine, and implement “stay-at-home” policies. This “all-hands-on-deck” approach was effective and a sign of the talents and commitment of our public health workforce. But it also led to worker burnout and uncovered a serious lack of capacity needed to respond to a pandemic. This impact may have been even more stressful in Wisconsin, as the state is tied with Nevada for the lowest spending on public health in the nation, at only \$72 per capita per year.³

The health care system was also stressed, despite the heroic efforts of frontline primary care providers and specialists who cared for

seriously ill patients (as shown on the cover art for this special issue). Shortages of masks, COVID-19 tests, nasal swabs, and intensive care unit beds led to delayed diagnoses and treatment.⁴ In addition, the pandemic had disparate effects on minority populations—often at higher risk from preexisting chronic condi-

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tions and having less access to primary health care services.^{5,6} The pandemic also led to the cancellation of routine surgeries and screening tests, further exposing the problems with a fee-for-service health care system, as hospitals and other health care systems lost revenue.⁴

Fortunately, our biomedical system responded to the call for a vaccine for a novel virus with incredible speed and success. In the early days of the pandemic, public health strategies, such as social isolation and wearing masks, were intended to “flatten the curve” and delay the spread of the virus, until a vaccine or treatments were developed. Few experts, however, predicted the vaccine would be ready for widespread distribution in less than a year. This success was built on decades of basic research, including research led by Jon Wolff, MD, at the University of Wisconsin School of Medicine and Public Health,⁷ and

subsequent research by Katalin Karikó, PhD, and Drew Weissman, MD, PhD, leading to their 2023 Nobel Prize in Medicine.

STRESS TEST RESULTS: COMMUNICATIONS, POLITICS, AND SOCIETY

In addition to the stress placed on the public health and health care systems, the COVID stress test brought to the surface serious problems in our news and social media systems. Leadership and clear communications are critical during a crisis. However, a recent survey showed that those who trust Newsmax, One American News, and Fox News hold more misconceptions about COVID than those who trust network news, local television, CNN, MSNBC, and NPR.⁸ Although some credible sources emerged on social media (eg, <https://thosenerdygirls.org/>), one study showed that a small number of physicians propagated COVID-19 misinformation about vaccines, treatments, and masks on social media with a wide reach.⁹ And an investigation by the *Washington Post* showed that doctors who spread misinformation are rarely held accountable.¹⁰

In addition to a failure in communications, the COVID-19 pandemic further stressed our already divisive political systems. Perhaps the biggest stress on our political system involved views of the role of government during a public health crisis. Our Constitution granted states the right to use “police powers” to constrain the rights of individuals for the collective good. This has been the mainstay of public health departments, used to reduce the risk of infectious disease outbreaks and the transmission of diseases like tuberculosis. These debates have made it harder for our state and local health officers to enforce evidence-based public health policies that reduce the risk of disease transmission.¹¹

Finally, the COVID-19 pandemic stressed individuals and families at all levels of society. The pandemic brought to the surface existing disparities in access to health care, prevalence of chronic conditions, and economic security.¹² The early responses to the pandemic were unfair, as low-income workers either lost their jobs or were deemed required “essential workers,” exposing themselves

and their families to risks. In contrast, high-income workers were able to transition to remote working, with fewer layoffs and losses in income. And the pandemic laid bare an unwillingness among some to follow simple, practical approaches to protect the health of others (eg, social distancing, vaccination, or use of masks).

RECOMMENDATIONS

When a patient fails a stress test, the clinician outlines a treatment plan to address the underlying disease and pathophysiology. The COVID-19 stress test exposed a variety of problems in our public health and health care systems, as well as in society in general. How should we respond?

First, as members of a civil society, we need to respond collectively to improve the capacity of our public health and health care systems to respond to the next pandemic. The CDC has taken a first step in this direction through its “Moving Forward” initiative, identifying ways to improve and institutionalize how it develops and deploys its science, both in pandemic and nonemergency times.¹³ A similar approach should be taken at state and local health departments. These changes to improve the capacity of public health and health care systems will require support among our legislators, not only of public health policies but also for the core funding needed to be prepared for the next pandemic.

Second, we need to find better ways to confront the pandemic of misinformation. Gone are the days when we got our news from a small number of highly respected national and local news sources. Given this plethora of news sources, our schools and universities need to develop courses focused on media literacy, enabling the public to discern fact from fiction. Physicians need to be more active in serving as credible sources of information, and our profession needs to do a better job of confronting those who willfully disseminate information that is harmful to the public’s health. For the most egregious instances, the state licensing board should revoke a physician’s license to practice medicine.¹⁴

Finally, each of us has a responsibility to act individually as citizens. Many of the fail-

ures in our response to the COVID stress test will require political solutions, from better public health laws to more funding for state and local public health departments. It is imperative that we support candidates and elected officials who represent our public health interests through sound, evidence-based programs and policies.¹⁵ The worst of the COVID-19 pandemic may be over, but the lessons learned from this stress test on our society cannot be forgotten.

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A survey done in Changzhi Medical College among undergraduates showed a correlation between the pandemic and academic delays and mental health.¹ Similarly, in Hong Kong, due to exam delays, students lost their appetites and developed sleep problems due to stress. In the same survey, out of 757 students, 20% reported stress levels of 10/10 on exam delays.¹ These findings suggest that setbacks and cancellations not only caused educational deficits, but also affected mental health. Further, in a survey of 248 medical students from 13 schools, 48% reported feeling depression and 52% felt lonelier.¹

In another study, 1139 allopathic medical students from Washington and New York were assessed for depression and anxiety symptoms and self-rated their mental health during versus before the pandemic. Seventy percent of respondents reported their mental health was worse than baseline following the initial months of pandemic; 61% reported experiencing some depressive symptoms (24% meeting criteria for major depression); and 58% reported some symptoms of anxiety (20% meeting criteria for an anxiety disorder).³ These findings suggest that over two-thirds of the medical students who completed the

survey believed that their mental health had deteriorated after the start of COVID-19.

There is no doubt that COVID-19 has had a negative effect on many medical and undergraduate students – myself included, and we have suffered in obtaining a well-rounded experience in the medical field. Fortunately, however, although it has been slow, the recovery to “normal” has begun.

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