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# Impact on Health Systems from COVID-19 and the Role of Social Determinants of Health

## Introduction

The COVID-19 pandemic strained the U.S. health care system to an extent not seen in the past, revealing and exacerbating pre-existing challenges. An already stressed system was immediately impacted at all levels—from patient access and care to financial well-being. The negative consequences persisted throughout the pandemic and are still felt today.

Before the COVID-19 pandemic, the U.S. health care system faced staffing shortages, particularly among nurses<sup>1</sup> and physicians.<sup>2</sup> The pandemic exacerbated these shortages. Health care workers cited COVID-19-related anxiety or depression, burnout, workload issues, and reaching traditional retirement age as reasons for leaving or intending to leave their jobs.<sup>3</sup> Further, 55% of health care workers in February 2022 reported their mental health was worse than before the pandemic.<sup>4</sup> Health care workers faced unprecedented changes in their daily work lives. They were furloughed, displaced from their primary practice locations, and experienced isolation from their families due to concern for COVID-19 transmission.

During the pandemic, hospital systems experienced shortages of vital personal protective equipment, ventilators, hospital beds, and COVID-19 treatments. Lockdowns at the beginning of the pandemic resulted in lost revenue from elective procedures. Combined with increased expenses, hospitals in the United States experienced a total loss of more than \$200 billion between March 1 and June 30, 2020.<sup>5</sup>

Of significance were the population groups disproportionately impacted in the United States.

While the COVID-19 pandemic affected the entire U.S. health care system, the most negative effects were overwhelmingly experienced in counties with higher rates of minoritized and economically disadvantaged populations. Areas such as these are also most often and most severely impacted by social determinants of health (SDoH), which greatly affect health outcomes.

## Social Determinants of Health

The World Health Organization (WHO) defines SDoH as “the nonmedical factors that influence health outcomes.” They are the “wider set of forces and systems” that influence how a patient lives, works, grows, and ages.<sup>6</sup> The forces and systems influencing SDoH include state and federal policies and the systems, social norms, and economic and development agendas. SDoH can be grouped into five major domains<sup>6</sup>:

- Economic stability
- Education access and quality
- Health care access and quality
- Neighborhood and built environment
- Social and community context

SDoH has and continues to shape and contribute to the disparities and inequities seen in health care before, during, and after the COVID-19 pandemic. One study published in July 2020 found the risk of COVID-19 infection was higher among people already affected by health disparities related to SDoH.<sup>7</sup> Multiple studies have demonstrated SDoH's impact during the pandemic on access to vaccines and available treatments, as well as morbidity and mortality rates. A literature review from May 2022 found studies confirming SDoH—such as race and ethnicity, poverty, housing, health care access,

education, and transportation access—affect the rates of infection and mortality from COVID-19.<sup>8</sup>

Another study reviewed COVID-19 mortality rates in rural and urban counties. In both rural and urban counties, COVID-19 mortality rates were higher in counties with higher proportions of Black people and individuals who have HIV and diabetes.<sup>9</sup> In urban counties, the unemployment rate and residential segregation were associated with increased mortality due to COVID-19. The authors found that for every 5% increase in residential segregation among white and Black people, the mortality rates due to COVID-19 increased by 3.4%. One explanation is that a higher number of Black people live in densely populated areas where transmission may be more likely and are more often employed in essential worker occupations where the risk of exposure is likely higher.<sup>10</sup>

Race also affects access to care and COVID-19 treatment access. One report found that 80% of the counties in the United States lack proper access to the services needed to maintain health.<sup>11</sup> Many of these areas are in southern states, where more than half of the Black population lives.<sup>12</sup> Other ethnic groups share the burden of lack of access to affordable care, as nonelderly American Indian and Alaska Native, Hispanic, Black, Native Hawaiian, and other Pacific Islander individuals continue to be more likely to lack health insurance compared to white people.<sup>13</sup>

SDoH influences COVID-19 vaccine availability and acceptance of the vaccine, as well. A study published in January 2023 found that Latinx and Black people in the United States were less likely to be vaccinated and that people who did not have health insurance, a primary care physician, and were unemployed were 30% less likely to be vaccinated.<sup>14</sup> Transportation access and digital literacy also contribute to COVID-19 vaccine rates. In the United States, 45% of households do not have access to transportation.<sup>15</sup> For many communities, when scheduling COVID-19 vaccine appointments required digital technology and literacy, vaccination rates were negatively affected, particularly for older populations and individuals who cannot afford or have access to a computer.

## COVID-19 Treatment Disparities

The repercussions of untreated COVID-19 are clear. Complications, such as ongoing fatigue,

post-exertional malaise, respiratory symptoms, depression, and anxiety, are all included as symptoms associated with long COVID.<sup>16</sup> People with chronic illnesses who contract COVID-19 could experience the worsening of their pre-existing disease. People with chronic illness also have higher mortality rates from COVID-19.<sup>17</sup> These complications all contribute to increased financial strain on people due to taking sick leave from work and increased health care costs due to their illness.

There are currently three antiviral options to treat COVID-19. Nirmatrelvir-ritonavir (Paxlovid<sup>®</sup>) and molnupiravir (Lagevrio<sup>®</sup>) are both oral treatments, while remdesivir (Veklury<sup>®</sup>) is an intravenous infusion given in health care facilities.<sup>18</sup> All three treatments have been shown to reduce the risk of hospitalization and death. In one trial, nirmatrelvir-ritonavir reduced the risk of hospitalization and death by 89% compared to placebo.<sup>19</sup> Similarly, remdesivir reduced the risk by 87%.<sup>20</sup> With molnupiravir, there was a 31% risk reduction rate.<sup>21</sup> Studies have also shown that COVID-19 antiviral treatment options can reduce the risk of long COVID.<sup>22-24</sup>

Treatment disparities among racial and ethnic groups were particularly evident early in the COVID-19 pandemic. One report showed that from March 2020 through August 2021, monoclonal antibody treatment was given to white and non-Hispanic patients at higher rates than to Black, Hispanic, Asian, and other race patients.<sup>25</sup> Another report demonstrated continued disparities in outpatient treatment of COVID-19 from April through July 2022. The percentage of adults treated with nirmatrelvir-ritonavir was 36% lower among Black patients and 30% lower among Hispanic patients than white patients.<sup>26</sup> Multiple factors contribute to these disparities in treatment. Counties with higher rates of poverty and those that are majority Black, Hispanic, and American Indian and Alaska Native have access to fewer health care facilities available to treat COVID-19.<sup>27</sup> Many of these same communities have transportation access issues that affect treatment rates for COVID-19.<sup>28</sup>

## Emerging from the Pandemic

While the COVID-19 public health emergency was declared over in May 2023, COVID-19 continues to impact health care systems. Staffing shortages

continue, contributing to a lack of access to care and availability of COVID-19 treatments.<sup>29</sup> Continued COVID-19 cases and upticks in hospitalizations with each wave of the disease divert focus away from patients with chronic medical conditions in terms of wait times for nonemergent procedures and doctor visits. The negative impact the pandemic has had on health care systems will continue for years as a result of the increase in severity of chronic disease due to deferring treatment at the start of the pandemic, catching up on preventive care, and managing long COVID and its complications.<sup>30</sup> Health care systems must work with government entities and community-based agencies to mitigate the adverse effects of COVID-19, decrease infection rates and complications, and increase treatment with approved antiviral medications to all communities.

During the COVID-19 pandemic, existing inequities of care across the United States became even more prevalent and obvious, with SDoH impacting the magnitude of these disparities. Racial and ethnic minority populations and economically disadvantaged communities continue to bear the greatest burden of COVID-19 and its complications. Attention and focus should be placed on further examining SDoH and how each impacts COVID-19 vaccination rates, illness, and treatment access to appropriately shape interventions to support communities disproportionately affected by the pandemic. State and federal programs and funding should be distributed with careful consideration of SDoH.

One such program is the Centers for Disease Control and Prevention's (CDC's) Bridge Access Program (<https://www.cdc.gov/vaccines/programs/bridge/index.html>). The program provides COVID-19 vaccines to adults without health insurance or those whose health insurance does not cover COVID-19 vaccines.<sup>31</sup>

Another federal initiative, launched in March 2022, is the Test to Treat program (<https://aspr.hhs.gov/TestToTreat/Pages/default.aspx>).<sup>32</sup> The goal of Test to Treat is to diagnose and promptly provide oral antiviral medication to patients. Nirmatrelvir-ritonavir and molnupiravir need to be started within five days of symptom onset to see a therapeutic benefit,<sup>18</sup> so this makes immediate access to the medications through

the program particularly important. Test to Treat sites are funded by the U.S. Department of Health and Human Services (DHHS) and are located at Federally Qualified Health Centers (FQHCs) and pharmacy-based clinics. Pharmacists have also been approved to prescribe nirmatrelvir-ritonavir.<sup>33</sup> Both strategies benefit communities with limited access to health care and those historically underserved communities.

The CDC and the Agency for Toxic Substances and Disease Registry's (ATSDR's) Social Vulnerability Index (SVI) (<https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>) is a tool created to identify communities in the United States that may need more support during a public health emergency or natural disaster.<sup>34</sup> Many states use SVI or similar indices to inform decision-making about equitably allocating resources to increase COVID-19 vaccination rates. Some states are utilizing these indices for COVID-19 treatments, as well.<sup>35</sup>

## Call to Action

Due to their roles as leaders in their communities, family physicians have a platform to ensure equitable access to COVID-19 vaccines, testing, and treatments. SDoH influence a patient's health and health care, and we can help. Studies estimate that SDoH affect as much as 50% of county-level variation in health outcomes.<sup>36</sup> Family physicians should recognize patients' SDoH and tailor their approach and care to mitigate health inequities and optimize care for COVID-19 and many other diseases and conditions.

Many electronic health records have screening tools and charts documenting patients' SDoH, and the AAFP has created its own Social Needs Screening Tool ([https://www.aafp.org/dam/AAFP/documents/patient\\_care/everyone\\_project/hops19-physician-form-sdoh.pdf](https://www.aafp.org/dam/AAFP/documents/patient_care/everyone_project/hops19-physician-form-sdoh.pdf)) to assess patients' SDoH. Lastly, recognizing the immense role SDoH plays in health outcomes, the White House released "The U.S. Playbook to Address Social Determinants of Health" (<https://www.whitehouse.gov/wp-content/uploads/2023/11/SDOH-Playbook-4.pdf>) to assist individuals and agencies in developing community partnerships for more equitable public health.

As family physicians, we should be aware of programs created during the COVID-19 pandemic

to increase access to COVID-19 vaccines, such as the Bridge Access Program and Test to Treat, as well as the awareness that our local pharmacists can prescribe nirmatrelvir-ritonavir. For patients with access to and knowledge of digital technology, we should make every effort to provide telehealth and video visits to treat COVID-19. Following the AAFP's recommendations, these actions and others can help reduce the burden on the health care system while addressing the SDoH that greatly impact the health of our patients.

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