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COMMENTARY

The implications of long COVID for rural communities

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The ongoing SARS-CoV-2 (COVID-19) pandemic has taken a considerable toll on the health and well-being of populations globally and in the United States. While much of the early spread concentrated in high population-density urban centers, individuals and communities historically at higher risk of experiencing adverse health, social, and economic outcomes are now disproportionately affected by COVID-19—including rural communities.[1–3]

Evidence suggests that the overall rate of infection and subsequent mortality in rural communities is higher than what is observed among their urban counterparts.[1,4] On average, rural populations tend to be older and experience more chronic conditions than urban populations, both of which are associated with an increased risk of severe COVID-19 illness and death.[2,5,6] Furthermore, well-documented historical barriers in accessing preventive and treatment-related health care services, which contribute to higher overall mortality and decreased life expectancy in rural communities, remains a salient issue during the ongoing pandemic.[2,7,8]

While the ongoing focus remains largely on controlling viral spread, vaccination efforts, and minimizing the loss of life—the potential for longer-term effects of COVID-19 infection is emerging as an important sequalae. Many individuals experiencing COVID-19 go on to experience what has been termed as post-acute sequelae of SARS-CoV-2 infection or long COVID.

While a formal definition and inclusion criteria has evolved, long COVID is generally characterized a "post-COVID-19 condition that occurs in individuals with a history of probable or confirmed SARS-CoV-2 infection, usually 3 months from the onset, with symptoms that last for at least 2 months and cannot be explained by an alternative diagnosis."[9] The list of symptoms associated with long COVID is extensive and can range in severity and duration but may include shortness of breath, chronic fatigue, tachycardia, exercise intolerance, and cognitive dysfunction.[9,10] While symptoms may persist following initial infection, they can also be newly onset among individuals with no prior history of a given symptom profile.[9–11] The underlying pathophysiology triggering long COVID remains an important, unsettled area of investigation; however, early indications suggest that long COVID exhibits many characteristics of autoimmune disease and often draws parallels with myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS).[12,13]

Estimating the prevalence of long COVID is very difficult given wide variation in case definitions, methods of ascertainment, study populations (hospitalized or nonhospitalized), and time frames considered. However, US-based studies suggest that approximately 10%-30% of those with COVID-19 may go on to experience long-term symptoms.[14,15] A study using private health insurance claims in the United States puts the estimate at 23.2% with higher rates among those with severe cases/hospitalization.[16] The duration of symptoms can vary widely. For some, long COVID symptoms resolve over time; however, for others, symptoms can persist for an extended period of time and be quite severe to the point of disability.[15] With current COVID infections in the United States at 76 million, it is estimated that 7 to 22 million individuals may experience long COVID.[17] This potential impact is a particularly salient issue for those infected in rural America.

First and foremost, long COVID places the health and well-being of rural populations at risk. Higher rates of infection coupled with

lagging vaccination uptake suggest that long COVID will likely affect individuals living in rural communities disproportionately relative to urban.[18] While symptoms and severity of long COVID can range from mild to severe, the potential impact on mental health, social function, and the ability to continue working can be substantial.[10] Significant proportions of individuals with long COVID report difficulty returning to a previous level of health and functioning, even those who were previously healthy with no underlying medical conditions.[19,20] While research on long-term functioning and returning to work is in their infancy, early findings suggest that many individuals with long COVID simply do not return to work or reduce work hours significantly.[19] This is consistent with previous longitudinal research focused on the other SARS-CoV outbreaks[21–23] and parallels previous research findings specific to ME/CFS.[24] While estimates of those who do not return to work can vary widely, recent projections from the Bookings Institution bear this out further, suggesting that long COVID is also a key contributor to existing labor shortages nationally, with long COVID accounting for about 15% of unfilled jobs.[25]

Potential gaps in employment are particularly problematic for rural communities given the economic impact of COVID-19 on employment in rural communities has already been substantial.[26] The inability to work and subsequent reduced income also has implications for health insurance and the affordability of the care needed to manage long COVID. Lower rates of health insurance are a persistent disparity within rural communities.[7] As employment and insurance are often linked, individuals residing in rural communities with long COVID are particularly vulnerable to crippling health care expenses. Even with health insurance, the battery of diagnostic testing and subsequent treatment plans likely pose a significant financial barrier for rural populations. Furthermore, news media coverage suggests that health insurance companies are also struggling to keep up with the novelty of long COVID and denied claims for long COVID care are becoming an issue when seeking care.[27] Fortunately, individuals experiencing long COVID to the point of interfering with 1 more daily activities may qualify for disability under the Americans with Disabilities Act.[28] However, proving a long COVID diagnosis and actually qualifying for benefits may an entirely different issue.[27,29] The health and economic impact of long COVID has important implications for individuals, families, and society as a whole that must be considered.[10]

Rural health care providers and health care delivery systems are also in a difficult position. Most states have long COVID clinics; however, these typically require multidisciplinary teams of specialist health care providers primarily located in urban centers.[10] The availability of the multidisciplinary specialty care needed to diagnose and treat long COVID is sparse in rural communities that already face longstanding structural barriers in accessing medical care.[30] Information and clinical best practices related to long COVID is a moving target.[10,31,32] Among clinics actively treating long COVID patients, most (73%) report experiencing obstacles in treating patients.[33] The need for more established protocols and more clinical resources top the list of barriers reported.[33] These challenges are most certainly exacerbated in rural communities.

As is stands, individuals seeking care for long COVID may find few answers, which is frustrating for both individuals and providers. Rural patients and providers already struggling with limited clinical capacity, now have their challenges compounded by a lack of resources to manage this complex and novel condition. Health literacy, or the ability to assess, understand, and use health information for decision making, also poses an additional challenge. Previous research suggests that rural populations typically have lower rates of health literacy than their urban counterparts.[34] As with other chronic conditions, long COVID may require ongoing communication and care management between individuals, lay caregivers, and their medical team.[35] This may be particularly difficult for individuals and providers when managing a novel condition and further increase the burden of long COVID in rural communities. There are many unknowns that providers, researchers, and individuals are trying to better understand to develop treatment protocols for long COVID.

The potential economic impact of long COVID on rural health delivery systems parallels that of individuals experiencing long COVID. Rural delivery systems provide care for a disproportionate number of uninsured individuals and payer mix is slanted toward government sources. This has put a significant financial strain on an already strained primary care and health delivery system in rural communities. In addition, nurses and other allied health workers in rural areas are just as susceptible to the impact of COVID infection and long COVID. The loss of these front-line caregivers is felt more acutely in rural areas without the population concentrations to draw upon as seen in urban areas.

At this point with long COVID, there are more questions than answers. The ultimate impact of long COVID on rural populations remains unknown. The emergence of new variants and subsequent long COVID sequelae provides an additional wrinkle. The extent to which new variants trigger long COVID symptoms remains unknown. The extent to which current/future vaccines protect against long as breakthrough infections occur remains unknown. Early evidence from pre-Omicron breakthrough infections suggests that receiving both vaccine doses reduced the risk of long COVID (symptoms 28 days or more) by half.[36] These findings underscore the importance of vaccine uptake in rural communities, which remains a challenge.

Taken collectively, rural communities have higher rates of infection and increased susceptibility for more severe disease. Given historical barriers in accessing care and less rural engagement in mitigation strategies—long COVID will have a disproportionate effect on rural communities, much like acute COVID.[37,38] As significant investments in long COVID research emerge,[39] ensuring that rural areas are represented in ongoing research efforts is critical for confirming that rural communities are not left behind as diagnosis, treatment, and rehabilitation programs and policies are developed.

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