Beyond the Disease Symptoms: Additional Impacts of COVID-19 on Rural Health and Health Professions Education: A Reflection of Where we Have Been and Opportunities for the Future

The impact of the COVID-19 pandemic is widespread globally and has dramatically impacted all sectors including, but not limited to: education, economics, and health care. Combined with the social and political unrest and a migrant crisis in the United States and abroad,[1] the era of COVID-19 has had a dramatic impact on the climate and culture in which we live. The effects of these situations have implications across all demographics and geographic locations. However, rural communities have been hit particularly hard during this time. The persistent issues in rural communities such as lack of access to health care and related providers, transportation, job opportunities, and other disparate issues[2] have been exacerbated by mitigation measures such as shelter in place orders, mandatory lockdowns, and other emergency public health measures that aimed to reduce the spread of the virus. In the United States, for example, the Centers for Disease Control and Prevention (CDC) reports that nearly 46 million Americans live in rural communities and the majority of these communities are highly susceptible to adverse outcomes using their Social Vulnerability Index.[3] According to the CDC, social vulnerability is defined as, "…the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters or disease outbreaks." In addition to social factors, the CDC describes a number of other characteristics specific to rural communities that can create a perfect storm for higher rates of infection and adverse outcomes related to the COVID-19 pandemic. These include demographic characteristics where rural residents are often older adults with additional comorbidities of chronic disease and higher rates of disability along with a lack of healthcare infrastructure to address severe illness.[3]

While mostly spared during the first wave of COVID-19 infections in early 2020, rural communities in the US and abroad were subsequently impacted. During the second wave, the issues of lack of access to tertiary care centers with intensive care units were more apparent in rural communities. The need to acquire personal protective equipment (PPE) was a significant concern during the early stages of the pandemic and impacted both urban and rural communities in a number of ways.[4] Along with PPE needs, additional resources in rural communities were not readily available to improve the initial response to the pandemic. This was evident in the unequal distributions of resources in rural communities where public health systems and long-term care facilities had to identify their own needed goods and services to help support and protect the communities they serve, with little to no initial support from the government. Other forms of health care were dramatically impacted, including preventive medicine and elective procedures. Although telemedicine has been used in rural healthcare systems before COVID-19, particularly in the field of behavioral health, the immediate need for primary care telemedicine resources to support preventive screening and routine care was unable to be developed to meet demand.[5]

While the pandemic was raging, another epidemic was going strong in rural communities. The ongoing opioid epidemic continued during a time when mitigation measures of the COVID-19 pandemic created an ideal environment for supporting risk factors of drug misuse and abuse in rural communities including social isolation and a lack of access to preventive medicine to screen for anxiety, depression, and other mental health issues. In a recently published study, Mueller and colleagues found that the COVID-19 pandemic has significantly impacted the well-being of rural residents.[6] According to their findings, "the effects of the COVID-19 pandemic on rural populations have been severe, with significant negative impacts on unemployment, overall life satisfaction, mental health, and economic outlook."

As reported by the CDC, the United States has seen a record number of overdose deaths during the pandemic.[7] The trend for increased drug overdose deaths had already been trending upwards before the pandemic, but the consequences of the pandemic have amplified and accelerated the overdose trend. This combined with the pandemic can have long-lasting consequences on the social fabric of rural communities in the US and abroad. As described by Monteith *et al.*,[8] rural communities were already at higher risk for negative consequences of mental health issues including suicide due, in part, "to interpersonal factors are well-established risk

factors for suicide, including social isolation,[9] loneliness,[10] lack of belonging,[11] and perceived burdensomeness." The issues of mental health and substance abuse, misuse, and abuse disorders require consistent attention even throughout the COVID-19 pandemic.

Another factor that continues to impact the ability of rural communities to effectively address mitigation measures of COVID-19 has been the persistent politicized misperceptions and mistrust of public health interventions. In addition, the rollout through emergency authorizations of the COVID-19 vaccine globally has amplified misperceptions and mistrust within vulnerable communities.[12-14] Vaccine hesitancy outside of the COVID-19 vaccine has been widely studied.[12-14] Larson *et al.* described there are a number of complex factors that contribute to vaccine hesitancy in general and many of these factors are aligned with the conditions around COVID-19 messaging and interventions in rural communities.[12] Mixed messaging from government entities, confusion among best practices to slow the spread of the COVID-19 virus, and the latent impact of the virus to rural communities during the first wave of the pandemic have all contributed to increased mistrust of the approach to address COVID-19 in rural communities.

Local public and municipal health departments have an opportunity to re-educate the populations they serve by understanding the unique and differing perspectives of the community members. The lack of vaccine utilization is related to vaccine hesitancy. Vaccine hesitancy in rural populations can be mitigated by addressing health literacy needs[15] as well as considering cultural humility. Cultural humility is defined by Hook, *et al*.,[16] as the "ability to maintain an interpersonal stance that is other-oriented (or open to the other) in relation to aspects of cultural identity that are most important to the [person]."[17] Using a cultural humility-focused approach allows for a dynamic process of meeting rural populations where they are at in terms of understanding and acceptance of the vaccine. Throughout this process, it is also critically important that community leaders reestablish and/or build trust among the communities they serve.[18] A trust-centered approach is foundational to the Community Health Worker model and has been seen as a successful strategy to engage with rural populations globally.[19] Building trust not only supports the opportunity for vaccine-hesitant populations to consider utilization tools available to prevent and reduce the burden of COVID-19, but it also allows for an important exercise for leaders and policymakers to better understand the needs of rural people in the context of policy recommendations.

The focus of many rural health professions education programs is on community engagement and community-based training and the pandemic dramatically changed the training landscape. The mitigation measures, including sheltering in place and social distance recommendations, have limited the interactions among patients, providers, and student trainees. In many instances, these measures required the immediate removal of students who were actively participating in required clerkships and elective training during the early days and months of the pandemic. The challenges in addressing real-time mitigation measures also impacted programs that are foundational to interprofessional education and training.

As a case example, the Rural Medical Education (RMED) Program, part of the Rural Health Professions (RHP) program through the National Center for RHP, University of Illinois College of Medicine Rockford, is a longitudinal, interprofessional training and education curriculum with pharmacy and nursing students who traditionally spend several hours a month participating in in-person classroom seminars, field trips and community-based training, and education opportunities.[20] Due to the pandemic, RMED faculty, along with RMED community-based faculty, and the Department of Medical Education had to quickly collaborate to pivot in curriculum delivery. This included developing a new virtual curriculum while also attempting to identify interprofessional-focused, rural, healthcare providers that were equipped with the telehealth infrastructure needed to effectively engage student learners to simulate in-person clinical training. In many instances, the network of existing RMED preceptors was not able to develop their telehealth infrastructure at a rate that allowed for students to participate in this training method. It was realized during this time that the majority of telehealth systems in rural areas only allowed for a patient and provider to interact either by phone or video platform and have not yet been configured to introduce a third-party student learner in the telehealth visit. This arrangement also made it difficult if not impossible to fully engage in interprofessional training during the first several months of the pandemic. As time has passed, virtual training via Zoom or other similar platforms has allowed for abbreviated delivery of the traditional coursework. However, the effects of having to pause community-based rotations and in-person interprofessional training and education opportunities remain to be seen. As the pandemic continues, additional creative consideration needs to be made to continue to recruit and retain RHP students to receive appropriate training to support their careers in rural health care, to meet the needs of underserved communities.

Future healthcare policies and recommendations from governing bodies should work to address the need to recognize cultural humility when approaching persistent gaps in accessibility and affordability of healthcare services as well as focus investments on infrastructure and the economic drivers that have been most acutely impacted by the effects of the COVID-19 virus. A recent Newsweek article highlighted why it is important for leaders and policymakers to address the

unique needs of rural communities. The article pointed out that, "when the economic drivers in these [rural] communities are taken away and then there's nothing to replace them, it's a concern not just for individuals living in rural America but certainly across the rest of the country as well."[21] The same impact can be universally applied to rural communities globally. Although the virus has further highlighted disparities in rural communities, it has also provided an opportunity to reset funding priorities and created an environment where innovation is driven out of necessity to protect and support the health and well-being of all rural people. Although the impacts of the pandemic in rural communities are significant, there, certainly, are significant opportunities to address gaps in resource distribution through more informed policies.

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