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# The Importance of Time, Place, and Person Applying Elementary Epidemiology to COVID-19 Outcomes in Rural Appalachia

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## **ABSTRACT**

Since the 1800s this traditional triad of descriptive epidemiology has allowed for effective interventions to deal with epidemics. A focus on time, place, and person also provides a critical framework for interventions in controlling the epidemic by focusing on those populations with the highest risk for disease.

Keywords: Appalachia, epidemiology, race, health disparities

**A**lmost 2 decades before the invention of the microscope, British Physician John Snow conducted a series of investigations that highlighted the importance of time, place, and person in the etiology of disease. Since the 1800s this traditional triad of descriptive epidemiology has allowed for effective interventions to deal with epidemics. A focus on time, place, and person also provides a critical framework for interventions in controlling the epidemic by focusing on those populations with the highest risk for disease.

Jessica Johnson and her colleagues at West Virginia University<sup>1</sup> have examined the impact of COVID-19 on West Virginians, in one of the research reports in this issue of the *Journal of Appalachian Health*. Demographics of race and rurality in this study offer an important insight to time, person, and place, as they relate to the disproportionate rates of hospitalization for rural Appalachian African Americans. By conducting this analysis, Johnson et al. remind us that the frequent view of Appalachia as a white, Scot-Irish enclave is a poor representation of the nature of Appalachian communities. Of historical significance is the reason for migration of African Americans from southern states to West Virginia. It was the importance of coal to the steel-making process that required miners to bring the coal out of the hills to power the engines of “progress” in America. The modest indigent population of Appalachia at the time had to be augmented by more miners, who were frequently blacks brought from the Black Belt of Alabama along with those who immigrated to America straight from Ellis Island. These populations added to the indigenous people of Appalachia from the early pioneers to become the miners who powered the building of America and the engine that created the war machine required by World War I. Appalachia, particularly Central Appalachia, has some of the highest burden from morbidity and mortality when compared to other regions in the U.S. The addition of blacks to the coal mining workforce of Appalachia has resulted in a lingering diaspora of black workers and their families in Appalachia. The disproportionate rates of disease and disability for African Americans compared to their white counterparts has also remained constant in Appalachia.

Rather than generalize from a myriad of studies that continue to demonstrate the significant gaps in overall health and wellness for African Americans compared to other rural populations, the authors of “The Compounding Effect of Rurality on Health Disparities Among Black Patients with COVID-19” sought to understand significant differences in blacks and whites who suffered hospitalizations from SARS-CoV-2. This level of thoughtful descriptive epidemiology seeks to examine disease incidence by race and rurality in Appalachia. The impact of racial minority status in rural populations and especially in Appalachia is often deemed to be of little statistical significance based on the assumption of low population numbers. The authors of this study,

however, recognized the importance of moving beyond sample size and power calculations and looked specifically at race and rurality in Appalachia. Their analysis demonstrates that blacks in Appalachia West Virginia fare worse with COVID-19, not only with acquisition of the disease but also severity, as measured by hospital admissions. Not only is difference in race a significant finding but it is compounded by the impact of rurality. This study finds that West Virginia's rural black population is not only more likely to develop disease but be hospitalized for complications from COVID-19 compared to those in more urban communities.

These findings raise two important research questions: Why do rural blacks acquire the disease more readily, and why is this population more likely to experience the severity of COVID-19 requiring hospitalization? Practical significance suggests that the disproportionate number of African Americans in West Virginia with severe COVID-related complications given their numbers in the state is troublesome.

Further observation and analysis then must look at the role of social determinants of disease including structural and systematic racism, and how these may play a role in the severity of COVID-19 for rural Appalachian African Americans. The early migration patterns and social conditions of blacks to the coal mining regions of the state leading to intergenerational disparities may need to be a part of a further look at time, place, and person. For the present day, the results of this study suggest that targeting rural black families for vaccination will result in the best use of resources to achieve a desirable health outcome. This observation further serves to inform continued research into the disproportionate rates of chronic and co-occurring conditions that put rural African-American populations in West Virginia at risk for complications from infectious diseases. Therefore, targeted comprehensive health communication, prevention messages, risk factor education, and awareness and appropriate implementation are also warranted.

The Journal will continue to feature and highlight submissions that demonstrate the significance of time, place, and person as part of its mission and goals to elevate work that demonstrates a social justice and health equity lens.

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