

# A Renewed Focus on Health Disparities in the Year 2020: Reexamining Geospatial Disparities

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## ABSTRACT

To achieve the ultimate goal of health equity for all people in the United States, new methods are necessary to further understand health disparities in cancer. Geospatial approaches to examine outcomes in cancer control and population sciences in the United States is an area of growing interest, but traditional methods are

hindered by the use of a single location at the time of diagnosis. Incorporating residential histories into geospatial analyses overcomes this challenge and is a step forward in improving our understanding of geospatial disparities in cancer outcomes.

*See related article by Wiese et al., p. 2119*

Although 2020 started the same as any other year with toasts and cheers to the New Year, it has been a year like no other in recent memory. What started as a single, seemingly isolated case of coronavirus disease 2019 (COVID-19) in January has now culminated at the time of this writing to more than 5 million cases and 160,000 deaths in the United States alone (<https://www.cdc.gov/nchs/nvss/vsrr/covid19/>; ref. 1). Along with the number of cases, hospitalizations, and deaths, COVID-19 has brought to light many health disparities that exist in the United States. Long-standing systemic health and social inequities have led to disproportionate spread and outcome disparities of COVID-19 infection within many communities (2, 3). Rates of COVID-19 cases are highest among minority populations including Latinos, Blacks, American Indians, and Pacific Islanders, with higher rates of hospitalizations and a 2- to 3-fold increased mortality risk ([https://www.cdc.gov/nchs/nvss/vsrr/covid19/health\\_disparities.htm](https://www.cdc.gov/nchs/nvss/vsrr/covid19/health_disparities.htm); refs. 4–7). Furthermore, the recent tragic death of George Floyd at the knee of a White Minnesota police officer has only further heightened the awareness of systemic disparities that exist in the United States (8). These events have culminated in a renewed focus and examination of health disparities within the United States. To achieve the ultimate goal of health equity for all people in the United States, new methods are necessary to further understand health disparities and a fundamental shift in conceptual thinking and approaches will be required.

Geospatial approaches to examine outcomes in cancer control and population sciences in the United States is an area of growing interest (9). Previous studies have demonstrated an association between reduced survival among patients with breast and colorectal cancer living in poor communities compared with those living in more affluent neighborhoods (10, 11). However, these studies and the many others that have examined geospatial disparities in relation to cancer outcomes utilize a single location at the time of diagnosis. This method

assumes a person remains in a fixed location throughout follow-up and that communities remain stagnant with little to no change over time. This substantial limitation to geospatial approaches to date limits our understanding of geospatial disparities and may have resulted in unrecognized biasing of results.

In the article by Wiese and colleagues, they describe a novel method of incorporating residential mobility into geographic studies in the examination of mortality disparities in cancer (12). Using colon cancer cases identified from the New Jersey State Cancer Registry, they additionally acquired residential histories through a unique data linkage with LexisNexis, Inc. The authors incorporated these residential histories into Bayesian spatial models to examine whether the survival of patients varied geographically and compared the differences in models using residency at the time of diagnosis alone with models that incorporate residential mobility.

The authors found that one third of patients changed their location during follow-up, with 12% moving completely out of the state of New Jersey. Using their novel incorporation of residential mobility as an extension of conventional Cox regression survival models, they found a wider range of adjusted risk of colon cancer–related death (range differences of 0.17 with initial model that changed to 0.37) and greater geographic disparity across the state compared with the model using only the location at cancer diagnosis. Although the overall range of differences in risk of death between the two models was generally small, there were some areas where the estimates changed direction (from low to high risk or high to low risk).

This is the first study combining geospatial cancer survival with residential mobility histories. Although the incorporation of residential histories in this particular analysis did not substantially change the general conclusions compared with the traditional approach, this method is a step forward in improving our understanding of geospatial disparities in outcomes and opens new avenues of exploration. This study provides a model for future studies using geospatial approaches to examine cancer outcomes. In a time of rising tensions and refocusing on disparities within our society, this study adds an additional tool to the existing toolkit in the understanding of geographic disparities. However, to actualize our ultimate goal of health equity for people in the United States, a fundamental and broad shift in approach will be needed along with novel interventions and policy changes.

## Disclosure of Potential Conflicts of Interest

G.R. Williams reports personal fees from Carevive Systems (developing educational content) and Cardinal Health (developing educational commentary regarding

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recent seminal research) outside the submitted work. No other potential conflicts of interest were disclosed.

## Disclaimer

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