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Spatial Accessibility to HIV Providers in Atlanta, Georgia

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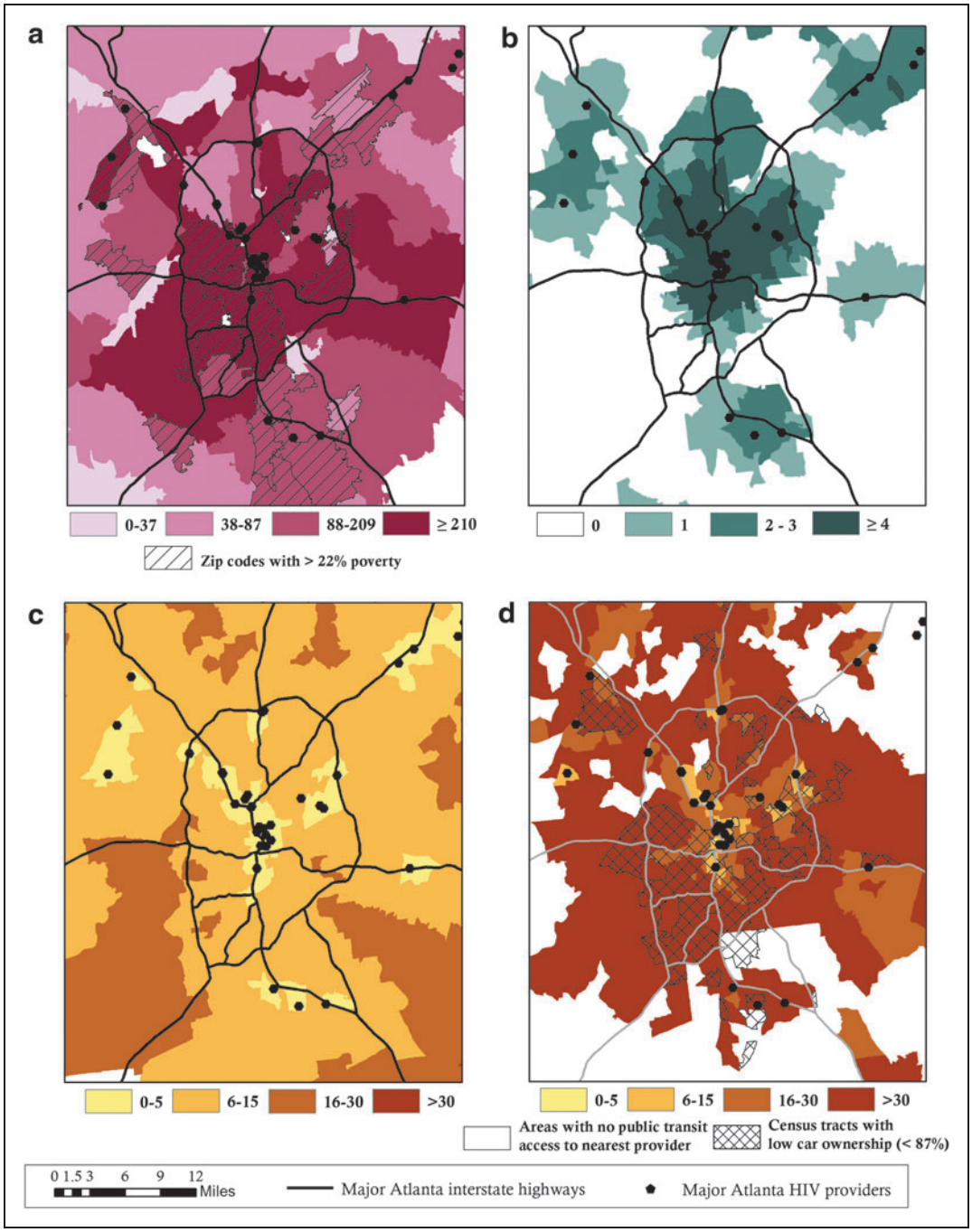

FIG. 1. **(a)** Number of HIV cases by ZCTA. **(b)** Number of major HIV providers within 5 mile driving radius of each census tract. **(c)** Commute time by car from each census tract to the closest HIV provider (minutes). **(d)** Commute time by public transit from each census tract to the closest HIV provider (minutes).

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Spatial accessibility to medical providers, which includes proximity to clinics and commuting characteristics,[1] can affect healthcare utilization among people living with HIV.[2] We mapped major HIV providers in the 6 county metropolitan Atlanta area and examined measures of spatial accessibility with respect to HIV case counts, poverty, and household vehicle ownership.

We obtained Atlanta HIV case counts by zip code tabulation area (ZCTA) from AIDSVu.org, an online tool illustrating HIV prevalence for multiple U.S. cities. Data on household vehicle access (a proxy for vehicle ownership) by census tract and households living in poverty by ZCTA were obtained from the American Community Survey. Areas with $< 87\%$ household vehicle ownership (cutoff based on national estimates of household vehicle access)[3] and the highest quartile of households living in poverty are presented.

We cataloged major HIV primary care providers in the 6 county area from the Southeast AIDS Training and Education Center Key Contacts booklet, the Georgia Care and Prevention in the United States (CAPUS) resource directory compiled the Centers for Disease Control and Prevention, the AIDS.gov HIV testing and care services locator, and the HRSA HIV treatment site locator. We also obtained a list of private practices treating HIV from a previously conducted Atlanta-based study in which a convenience sample of HIV-positive participants was asked where they received their HIV primary care.[4] We used ArcGIS 10.2 to estimate the number of providers within a 5-mile driving radius of each census tract centroid. The Google maps API was used to estimate commute time between census tract centroids and the closest HIV provider (by distance) by car and by public transportation.

The highest quartiles of HIV case counts were observed in central and south Atlanta (Fig. 1a). Overlapping areas of high HIV case counts and poverty were primarily observed in south and southwest Atlanta. The density of available HIV providers is greatest in central and north-central Atlanta, with urban south Atlanta and surrounding suburban/rural areas having limited accessibility (Fig. 1b). Figure 1c shows that most census tracts were within 15 min of an HIV provider by car; by contrast, Fig. 1d demonstrates that commute time to the nearest provider increased substantially if traveling by public transportation. Regions with no public transit service to the nearest HIV provider are indicated in white. Areas of low vehicle ownership may indicate a reliance on public transportation for travel, and are observed primarily in southwest Atlanta, where higher HIV case counts are observed.

Our HIV provider list may underrepresent smaller private practices treating HIV. We did not account for whether providers were taking new patients, so accessibility could be overrepresented by our maps. We did not account for traffic patterns in commute time calculations. Finally, all associations presented are ecologic.

Despite these limitations, these results highlight greater case burden and poorer spatial accessibility to HIV providers in southwest Atlanta compared to other areas of the city. Longer commute times by public transportation may be a greater burden among those in southwest Atlanta who might rely on public transportation. More studies should further investigate gaps in HIV provider accessibility to inform intervention planning strategies for HIV prevention and treatment in Atlanta.

Author Disclosure Statement

No competing financial interests exist.

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