FOUR OF THE 10 LEADING CAUSES OF DEATH in the United States are chronic diseases for which diet is a major risk factor. Racial disparities in the burden of these chronic, diet-related diseases are well documented, with African Americans often having the highest morbidity and mortality. Because health risks and resources are spatially and socially structured and African Americans disproportionately live in economically disadvantaged neighborhoods, increased attention has been focused on how residential environments shape health and contribute to racial disparities in health. An extensive body of literature now associates residence in economically disadvantaged neighborhoods, after control for individual socioeconomic status, with a variety of adverse diet-related health outcomes.

Despite numerous research efforts that have examined neighborhood variations in health, relatively little is known about the mechanisms by which neighborhood environments affect health. One hypothesis is that economically and socially disadvantaged neighborhoods have inadequate access to healthy foods, thus negatively affecting dietary quality and health. Although the presence of supermarkets may not always be beneficial for neighborhood residents (e.g., if supermarkets displace smaller stores with owners who had positively contributed to and invested in the neighborhood), such large stores can be neighborhood health resources providing generally better availability and selection, higher quality, and lower cost of foods compared with smaller food stores. These food resource factors influence dietary patterns. Previous studies have found that fewer supermarkets are located in African American neighborhoods compared with White neighborhoods and are located in economically disadvantaged neighborhoods compared with affluent neighborhoods. Other studies have found no differences in the accessibility of supermarkets according to racial or socioeconomic characteristics of neighborhoods. This discrepancy could reflect either differences in the definition of supermarkets or true variability in results across time and place that may be caused by differences in the degree of racial or economic segregation. Lower purchasing power is an often-cited but disputed explanation for the relative scarcity of supermarkets in economically disadvantaged neighborhoods.
Analysis of the role of race without regard to poverty and of poverty without regard to race offers an incomplete picture of the potential importance of these factors in shaping the spatial accessibility of supermarkets. Understanding these relationships is critical for informing intervention and policy efforts. Such an understanding is particularly important, given the roles of racial residential segregation and economic restructuring in concentrating poverty in African American neighborhoods of older industrial cities of the Northeast and Upper Midwest. 

Therefore, we sought to determine whether supermarkets are located at farther distances from the center of African American neighborhoods compared with White neighborhoods regardless of neighborhood economic conditions or if racial disparities in supermarket accessibility occur only in higher poverty contexts.

**Methods**

**Setting and Sample**

The setting for this study was the Detroit metropolitan area in Michigan. Metropolitan Detroit is characterized by extreme economic inequalities across neighborhoods. Economic inequalities can be traced to the period just after World War II, when highway construction and cheap land outside the city led many industries to relocate to the suburbs. Between 1950 and 1990, the city of Detroit lost approximately 350,000 jobs largely owing to the relocation of industries to the suburbs, deindustrialization, and other facets of economic restructuring. At the same time, discriminatory federal housing policies and lending practices, racial steering (the act of real estate agents systematically showing African Americans to different neighborhoods than Whites), restrictive covenants, and violence created and reinforced racial residential segregation in metropolitan Detroit. In effect, African Americans were confined to the least desirable, older residential neighborhoods of the city, whereas Whites were able to move to more desirable, newer suburban locations.

The city of Detroit shifted from 16.2% African American in 1950 to 81.2% African American in 2000, a sharp contrast with the 84.8% of metropolitan Detroit residents outside the city limits who identified as non-Hispanic White in 2000. Metropolitan Detroit remains one of the most racially segregated areas in the United States—ranked second overall in residential segregation of African Americans in 2000. The sample for this study was 869 neighborhoods (we used census tracts as proxies) in the tricounty Detroit metropolitan area. These neighborhoods are located in the city of Detroit and in the tricounty Detroit metropolitan area (Wayne, Oakland, Macomb counties) within a 10-mile buffer of Detroit.

**Measures**

We used 2000 decennial census data to characterize the neighborhoods. Population density was computed as the total population per square mile (median = 5367.44). Racial composition was defined as the percentage of non-Hispanic African American residents (median = 6.06%). Neighborhood poverty was defined as the percentage of residents below the poverty line (median = 8.21%).

Given that 92% of residents in tricounty metropolitan Detroit were either non-Hispanic White (67.3%) or non-Hispanic African American (24.9%), neighborhoods with low proportions of African Americans generally correspond with predominately White neighborhoods.

Supermarkets were defined as supercenters (e.g., Meijer, Super Kmart) and full-line grocery stores (e.g., Farmer Jack, Kroger) associated with a national or regional grocery chain, i.e., a chain with 11 or more retail stores. To identify supermarkets, we obtained a 2001 list of grocery stores from the Michigan Department of Agriculture. We used 2001–2002 paper telephone directories, as well as online telephone directories and company Web sites, in the fall of 2002 to verify the addresses of these supermarkets and to identify additional supermarkets. We confirmed the address of any supermarket not on the Michigan Department of Agriculture list by telephoning the store. One hundred and sixty supermarkets were identified in Detroit and in the metropolitan area within a 15-mile buffer of Detroit. The additional 5-mile buffer of supermarkets around the sampled neighborhoods helped to ensure that we could calculate supermarket accessibility for neighborhoods at the periphery.

The nearest supermarket was significantly further away in neighborhoods with a high proportion of African Americans and in the most impoverished neighborhoods compared with neighborhoods with a low proportion of African Americans and the least impoverished.
neighborhoods, respectively. (These results were adjusted for population density.)

Among the most impoverished neighborhoods, distance to the nearest supermarket varied considerably by percentage African American, with the nearest supermarket averaging 1.10 to 1.15 miles farther in neighborhoods with medium . . . and high . . . proportions of African Americans, respectively, than in neighborhoods with low proportions of African Americans. . . .

Discussion

Disparities in Supermarket Accessibility

The relationship between neighborhood racial composition and supermarket accessibility varied according to neighborhood poverty level in metropolitan Detroit. The distance to the nearest supermarket was similar among the least impoverished neighborhoods across the 3 tertiles of percentage African American. However, disparities in supermarket accessibility on the basis of race were evident among the most impoverished neighborhoods: the most impoverished neighborhoods in which African Americans resided, on average, were 1.1 miles farther from the nearest supermarket than were the most impoverished White neighborhoods. Most African Americans in tricounty metropolitan Detroit reside in neighborhoods that are in the upper tertile for percentage poor and that have either a high proportion of African Americans (60%) or a medium proportion of African Americans (20%), as defined in this study.

Inadequate accessibility to supermarkets may contribute to less-nutritious diets and hence to greater risk for chronic, diet-related diseases. In a recent qualitative study, Detroit residents reported that lack of access to supermarkets was a barrier to healthy eating.50 At least 3 previous quantitative studies, all of which examined chain supermarkets, have suggested that closer proximity to supermarkets is associated with better-quality diets.51-53 The observation that the nearest supermarket averaged 1.1 miles further in the most impoverished neighborhoods in which African Americans resided . . . compared with the most impoverished White neighborhoods . . . is particularly salient, given that 23% and 28% . . . of households in the most impoverished neighborhoods in which African Americans resided did not own a car in 2000.

We began the study with 3 measures of supermarket accessibility: distance to the nearest supermarket, number of supermarkets within a 3-mile radius (considered reachable by car), and potential supermarket accessibility. . . . Because the patterns of these relationships were similar, we present only distance to the nearest supermarket. For all 3 measures, supermarket accessibility was comparable among the least impoverished neighborhoods regardless of neighborhood racial composition, whereas disparities were evident among the most impoverished neighborhoods. The most impoverished neighborhoods in which African Americans resided . . . averaged 2.3 and 2.7 (respectively) fewer supermarkets within a 3-mile radius and had lower potential supermarket accessibility relative to the most impoverished White neighborhoods. . . .

Race appears to be an important factor with respect to supermarket accessibility in the context of more impoverished neighborhoods; 76% of neighborhoods with a high proportion of African Americans were among the most impoverished. The disproportionate representation of African Americans in more impoverished neighborhoods in Detroit can be traced historically. Until the 1940s—a decade in which Detroit's African American population doubled from 149,119 to 300,506 because of the influx of African Americans from the South for manufacturing jobs—African Americans generally resided in central Detroit and east central Detroit.35,36 Facing overcrowded and substandard housing, African Americans began moving to other parts of the city.39,55,56 Nevertheless, institutional racism—specifically racial residential segregation—confined African Americans to Detroit neighborhoods that began losing employment opportunities, particularly in the manufacturing industry, in the 1950s.39,41,44 Between 1948 and 1967, Detroit lost nearly 130,000 manufacturing jobs.39

Often confronting strong resistance from Whites, African Americans first moved to nearby neighborhoods in central Detroit.66,57 Hence, many neighborhoods located in central Detroit.56 transitioned from White to African American in the 1950s and 1960s when African Americans moved in and Whites moved out to newly constructed housing in northeast and northwest Detroit and the suburbs. Businesses closed soon thereafter, particularly after the 1967 racial discord, further compounding the adverse economic impact of the loss of manufacturing jobs.39,44,58 Hence, the number of abandoned homes and
businesses, including grocery stores, grew, and poverty increased substantially.

This pattern of White flight and economic divestment was repeated during several decades across Detroit neighborhoods. Residential patterns of African Americans generally expanded outward in a stepwise progression from central and east central Detroit toward the northern city boundaries and eventually to Southfield, a suburb adjacent to northwest Detroit.49,57 Neighborhoods located in the northernmost portion of Detroit near Eight Mile Road, the infamous African American-White racial dividing line of metropolitan Detroit, and particularly in northwest and northeast Detroit were among the most recent neighborhoods to transition from White to African American. Some neighborhoods, such as those in the far northwest Detroit community of Redford, shifted to African American as late as the 1990s.44,57,59,60 Similarly, in the suburb of Southfield, the African American population has grown tremendously, from 102 people (0.1% of the population) in 1970 to 42,259 people (54%) in 2000.57 The number of African Americans in Southfield increased by 48% between 1990 and 2000 alone, despite an increase of only 3% in the city’s total population.

This social history of metropolitan Detroit neighborhoods is relevant to our study because, among the least impoverished neighborhoods, all but 1 of the predominately African American neighborhoods with supermarket accessibility equivalent to that of their predominately White counterparts were located in northwest and north central Detroit and in Southfield. An optimistic interpretation of our findings is that supermarkets have newly opened or have remained open in or nearby these middle-income, yet racially transitioning, neighborhoods. This interpretation provides hope that supermarkets will invest or stay invested in African American neighborhoods as long as the residents have sufficient purchasing power to make these outlets profitable. An alternative interpretation of the findings is that among the least impoverished neighborhoods, African American neighborhoods have supermarket accessibility equivalent to that of predominantly White neighborhoods only because the supermarkets located in and nearby are remnants of historically White neighborhoods. Longitudinal data are needed to empirically test these different theories. If these areas remain African American, if they maintain a middle-income population, and if supermarkets remain open in or near these neighborhoods, then economic development may be a key intervention strategy to improve supermarket accessibility in African American neighborhoods. If, conversely, supermarkets close or do not open new sites in these economically stable African American neighborhoods, then factors associated with race are a more likely cause of disparities in supermarket accessibility. Indeed, our finding of disparate supermarket accessibility among the most impoverished neighborhoods by neighborhood racial composition warrants further investigation to identify contributing factors.

Practice and Policy Implications

The results of the study have several practice and policy implications. Pursuit of these strategies would benefit from a partnership approach between public health professionals and community members to ensure the local relevance of intervention strategies and to enhance community capacity for future intervention efforts.60 In the first of these implications, the results suggest the critical importance of working to redress fundamental inequalities between African Americans and Whites in order to reduce chronic, diet-related diseases among African Americans.62 For example, the economic development of African American neighborhoods could be enhanced by policies of creating jobs that pay a fair wage, to improve educational quality and opportunities for adults to increase job skills, to subsidize child care, and to attract new businesses. Second, working to attract supermarkets to economically disadvantaged African American neighborhoods in Detroit is a specific economic development strategy that may directly improve food access. Supermarket development can enhance local economic vitality by (1) providing jobs for residents, (2) increasing the local tax base, (3) making foods available at lower prices, thereby increasing the spending power of residents, and (4) attracting other forms of retail.34,35,63 Supporting African American ownership of and employment at these supermarkets may be critical to their acceptance and success.64
Third, a metropolitanwide planning approach to the food system needs to be pursued. Ideally, the food system would be evaluated holistically to ensure that all communities are served equitably. Fourth, in the short term, inadequate transportation is a significant barrier for residents of economically disadvantaged African American neighborhoods’ gaining access to supermarkets. Affordable public transportation needs to be improved by integrating transportation routes with supermarket locations.

Fifth, on the basis of our findings of disparate access to supermarkets among the most impoverished neighborhoods by percentage African American residents, efforts to expand the Community Reinvestment Act, a law designed to combat discrimination in commercial real estate lending, may be warranted. Finally, given that racial ideologies are likely to shape the political will to pursue these intervention strategies, public health researchers and practitioners need to work to challenge racial stereotypes in public discourse.

Helping to contextualize the plight of African Americans historically and spatially and to identify its ramifications for health were the primary intents of this study. We found that the historically influenced concentration of African Americans in higher-poverty neighborhoods in Detroit adversely affects spatial access to supermarkets, a resource of potential great importance in promoting the health of African Americans.

**Seeing the Big Picture**  
**Urban Food Deserts: Race, Health, and the Lack of “Real” Food**

Compare health outcomes by race in Section III (diabetes, obesity, hypertension) with rates of poverty by race in Section VI of the Appendix. What role do poverty and residential segregation by racial groups play in having access to “healthy foods” found in a supermarket compared to the processed, salty, and fatty foods that dominate corner stores or bodegas?