

Metropolitan Fragmentation and Health Disparities: Is There a Link?

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Context: This article explores the relationship between metropolitan fragmentation, as defined by the total number of governmental units within a metropolitan statistical area (local municipalities, special service districts, and school districts), and racial disparities in mortality among blacks and whites in the 1990s. The presence of numerous governmental jurisdictions in large metropolitan areas in the United States can shape the geography of opportunity, with adverse consequences for health.

Methods: We conducted a regression analysis using U.S. Census of Government data and Compressed Mortality File data for the country's largest 171 metropolitan statistical areas.

Findings: We found a link between increased metropolitan area fragmentation and greater racial differences in mortality between blacks and whites for both children and working-age adults. Although increasing fragmentation is associated with a higher mortality rate for blacks, it is not associated with a higher mortality rate for whites. These findings suggest that research is needed to understand how governance can positively or negatively influence a population's health and create conditions that generate or exacerbate health disparities.

Conclusions: We need to understand the extent to which metropolitan fragmentation contributes to racial segregation, whether racism contributes to both, and the role of poverty and antipoverty policies in reducing or exacerbating the consequences of metropolitan fragmentation. The exact pathways by which metropolitan fragmentation contributes to differences between blacks'

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and whites' mortality rates are unknown. Uncovering how institutions influence the social, economic, and environmental conditions, which in turn contribute to the current racial and ethnic health disparities in the largest metropolitan areas, is key. Understanding these "upstream" determinants of a population's health and the disparities in health between subgroups in the overall population must be at the core of any attempt to reduce disparities in health. Building bridges between urban planning and public health can be critical to these efforts.

Keywords: Metropolitan fragmentation, health disparities, mortality, planning.

Whether we are highly skilled professionals or minimum-wage workers, it matters where we live. Place affects our access to jobs and public services, our access to shopping and culture, our level of personal security, the availability of our medical services, and even the air we breathe.

Peter Dreier, John Mollenkopf, and Todd Swanstrom, *Place Matters*

Historical Factors Contributing to Metropolitan Fragmentation and Inequality

SINCE WORLD WAR II, METROPOLITAN AREAS IN THE United States have changed dramatically. Driven by social, political, and economic structural factors, these changes have contributed to unequal access for the less affluent to important quality-of-life factors such as good medical care, affordable and efficient transportation, adequate housing, high-performing public schools, jobs that pay a livable wage, and green recreational and open space. In turn, these factors have widened racial/ethnic and class divisions, reduced social and economic opportunities for the economically disadvantaged and minorities, and led to the concentration of unhealthy living conditions in areas where the most economically disadvantaged reside. We believe that besides moving protective resources away from such areas, they also may contribute to disparities in health. Our analyses document the extent to which metropolitan political fragmentation, a major indicator of unequal development, is associated with increasing racial disparities in mortality.

Among the structural factors that have led to the current inequitable development in metropolitan areas are federal housing and transportation policies, racial residential segregation and redlining, deindustrialization, and exclusionary zoning and urban planning. Federal housing policy and programs have had perhaps the greatest impact in enabling the rapid growth of suburbanization and reinforcing residential segregation. After World War II, the home loan and insurance programs of the Home Owners Loan Corporation (HOLC), the Federal Housing Administration (FHA), and the Veterans Administration (VA) enabled middle- and upper-middle-class white Americans to relocate from the central cities to newer, largely racially homogeneous suburban communities (Cashin 2010; Jackson 1985). These programs provided affordable thirty-year amortized home loans to a majority of white Americans (Judd and Swanstrom 2006). More important, these housing policies enabled whites to move out of the central cities to separate municipalities in the suburbs (Powell 2002), with the FHA and VA financing nearly all the new homes purchased in the suburbs between the 1940s and 1960s (Judd and Swanstrom 2006). Discriminatory practices by the FHA and HOLC helped limit economic opportunities for blacks and other ethnic minorities to become home owners and move to the suburbs, because they approved home loans mainly for white residents residing in “economically sound” suburban communities. This strategy enabled the private-sector lending institutions to protect their investments (Jackson 1985; Judd and Swanstrom 2006; Powell 2002). Massey and Denton’s landmark book *American Apartheid* provides evidence that 80 percent of real estate agents in Chicago refused to sell homes to racial minorities and that more than two-thirds refused to rent to racial minorities (Massey and Denton 1993; Powell 2002).

Racial residential segregation has had an especially damaging impact on the black community. Although low-income white residents were able to move out of the central city, most blacks were not able to find affordable housing in the suburbs (Judd and Swanstrom 2006). Furthermore, those blacks who did move to the suburbs moved to similar economically disadvantaged neighborhoods in inner-ring suburbs (Sampson and Sharkey 2008). The result is that the urban poverty and health problems in the metropolitan area are now spread out between central city communities and older inner-ring suburbs (Judd and Swanstrom 2006).

In addition to federally subsidized home loan programs, the federal government encouraged white migration from the central cities to

separate suburban jurisdictions through the Federal-Aid Highway Act of 1956, also known as the National Defense Highway Act. This act, completely subsidized by taxpayers, enhanced the national system of integrated roadways and set aside money to build up to 41,000 miles of highways across the United States (U.S. Department of Transportation 2007). The national integrated highway system built highways directly from the central cities to the suburbs, making it easier for white suburbanites to commute into the city for work. At the same time, a large number of economically disadvantaged urban residents were left largely isolated in the central cities, away from the growing economic opportunities in the suburbs (Morello-Frosch and Lopez 2006). Several studies have shown that this “spatial mismatch” is a great challenge for economically disadvantaged central-city residents because of their lower rates of vehicle ownership and the lack of an integrated regional public transportation system, limiting their access to better-paying jobs in the suburbs (Baum 2009; Ong and Miller 2005; Raphael and Stoll 2010; Stoll 2005).

Finally, this inequitable development, created by zoning and planning practices, has also helped fragment metropolitan areas according to race and class. Although zoning and planning may be perceived as objective, they nonetheless can be highly political and class conscious (Sze 2007). According to Judd and Swanstrom, early in the twentieth century, zoning became popular because it was an “effective method of regulating land use, making it difficult or impossible for less affluent people to cross community boundaries” (2006, 260). A number of examples show how zoning was used for this purpose in the United States. As Julie Sze argues in her book *Noxious New York*, zoning in New York City was a social and political process: “Large areas of the Bronx, Brooklyn, and Queens were classified as unrestricted (with less protection than residential areas from more environmentally hazardous facilities), including many poor and working-class areas in New York City” (Sze 2007, 43). She goes on to argue that zoning in New York City had an economic rather than a public health rationale and that zoning and race are closely related. For example, in New York City, the Bronx had the greatest increase in manufacturing zones, and was also the borough with the highest concentration of poor and minority residents, whereas Manhattan had the smallest increase in manufacturing zones (Sze 2007). The great amount of land zoned for manufacturing in the Bronx also exposed its

residents to a disproportionate share of environmental toxins, compared with that for New York's other boroughs.

All these factors have contributed to the development of metropolitan regions that are highly fragmented on the basis of race/ethnicity and socioeconomic position and have led to important questions. How has the government contributed to or ameliorated the inequality in many U.S. metropolitan regions? How do governmental institutions help maintain citizens' quality of life? In essence, do uncoordinated, multiple governmental jurisdictions in a metropolitan region make the unequal distribution of resources more likely?

The Role of Governmental Institutions in Distributing Resources

Local governmental jurisdictions (i.e., local governments, special service districts, and school districts) may contribute to economic segregation and suburban sprawl through the regulation of land use, determining how and where physical infrastructure, transportation, and housing are built and how social services are distributed (Frug 1999). For instance, local governmental jurisdictions, such as special-service districts, can determine the level and quality of services (sewage treatment, parks, firefighting, etc.) provided to specific communities. Often the most affluent communities are able to increase and improve public services through the creation of special-service districts. In turn, the proliferation of local governmental jurisdictions has created "cities . . . bordered by a patchwork of independent suburban jurisdictions" (Frumkin, Frank, and Jackson 2004, 35). That is, too many suburban jurisdictions in a metropolitan region pose "a dilemma for the governance of metropolitan areas" because they are less able to "confront issues that are regional in scale and require coordinated action" (Frumkin, Frank, and Jackson 2004, 35). This is especially challenging today for cities struggling to address, at the local level, issues related to economic development, health, housing, education, and physical infrastructure (water and sewage treatment, transportation, etc.) when resolving these largely regional issues requires a coordinated regional strategy. This fragmentation means that many of our nation's largest metropolitan regions have a huge number of independent local jurisdictions that do not coordinate their sharing of

resources and competition for businesses and affluent residents, which over time can have a significantly different impact on the lives and opportunities of the region's most vulnerable residents (Pastor, Dreier, and Grisby 2000).

In addition, Paul Jargowsky argues that fragmented government allows more affluent families to choose the jurisdiction they will live in, based on housing, tax burden, and, especially, such public amenities as schools (Jargowsky 2002). As a consequence of these choices, those in better socioeconomic positions are able to separate themselves from less well-off individuals and, at the same time, to live in a better-equipped environment. This process helps maintain and reinforce racial and economic segregation, as well as exacerbate stereotypes and distrust between racial/ethnic groups, thereby making it more difficult to change public policy (Jargowsky 2002). Over time, this type of behavior can create an "us versus them" mentality in which the majority suburban areas support public policies that directly benefit them (e.g., augmenting funding for public schools, increasing police service and fire protection, creating and renovating public parks, making infrastructure improvements), rather than policies that are perceived to support primarily lower-income and/or minority urban residents (e.g., regional tax sharing, regional affordable housing development/regional housing needs assessment [RHNA]).

Gerald Frug contends that metropolitan areas are so fragmented at the local level that government has enabled these jurisdictions "to wield their zoning and redevelopment authority to foster their own prosperity even if it is won at the expense of their neighbors" (Frug 1999, 3). Some people believe that regional policy has been undermined and that it has become more difficult to address issues such as "urban sprawl; improve opportunities for disadvantaged populations; decrease racial, ethnic, and economic segregation; and conserve natural assets and open space" (Orfield and Luce 2010, xiii). The fierce competition over resources, especially public services and the financing of infrastructure, has propelled wealthier communities to create their own special-service districts (e.g., water and sewage treatment, fire protection, economic development), which allows them to pay for services rendered only to their area. As a result, the continuing increase in metropolitan special-service districts nationwide has created a divide between the haves and the have-nots. More affluent communities can provide special services to their area without sharing their resources and financing with economically disadvantaged communities in the same region. But the proliferation of

special-service districts can erode the universal availability and equal distribution of public services such as education, infrastructure, and social services, which arguably need to be supported and coordinated at the regional level.

Research Question

Because of their multiple roles in shaping tax policy, prioritizing social services, and generally determining how resources are distributed across a region, local governmental jurisdictions can influence metropolitan regions' growth and development. This growth and development has historically been unequal, leading to greater inequality and opportunity gaps between more affluent and less affluent residents in a particular region. Little attention, however, has been paid to whether these inequalities in growth and development also affect both health and health inequalities. There are compelling reasons for thinking that they may. For example, a large and growing literature has documented the unequal spatial distribution of health in census tracts, zip codes, and neighborhoods. Many of these studies used multilevel analytic techniques to establish contextual effects on health outcomes that are independent of differences in the types of individuals who live in the different areas. They examined the risks of all-cause and cause-mortality, hypertension and blood pressure, high cholesterol, coronary heart disease, poor respiratory function, obesity, low self-rated health, birth weight, asthma, injuries, physical activity, depression, physical function and disability, and many other outcomes (Anderson et al. 1997; Balfour and Kaplan 2002; Cooper et al. 2001; Cummins et al. 2007; Diez-Roux et al. 2001; Haan, Kaplan, and Camacho 1987; Kaplan 1998, 1999; Kawachi and Berkman 2003; LaVeist 1993; Morenoff et al. 2007; Schoeni et al. 2008; Schulz et al. 2002; Yen and Kaplan 1999). These studies looked at a wide variety of spatial/contextual characteristics—from air pollution to poverty to segregation to social cohesion—that can reflect the actions of local governments and jurisdictions through their ability to affect the distribution of risks and resources. The effects of these actions can be both direct, for example, influencing the location of toxic dumps or schools, or indirect, through development, job creation, and the enactment and enforcement of zoning and local ordinances. Similarly, the effects of these actions on health can be both direct (e.g., locating toxic

dumps) and indirect (e.g., creating jobs or improving education). In short, the premise of our analyses is that metropolitan fragmentation allows the risks of poor health and resources that protect health to be differentially spatially distributed and also that greater fragmentation may reflect social, historical, and political processes linking even more fragmentation to greater spatial inequality in the distribution of risks and resources.

Even though black-white disparities in mortality have been widely studied, explanations remain elusive (LaVeist 2005), and so they are the focus of our analyses. Metropolitan areas with high levels of fragmentation may embody the spatial social, historical, and political processes of discrimination and exclusion, allowing for large spatial inequalities. Thus we expect higher levels of metropolitan fragmentation to be associated with greater black-white differences in mortality.

Methodology

The total number of governments for metropolitan areas for the year 1997 is from a data set compiled by Christopher Briem at the University of Pittsburgh (Briem 1997), using Census of Government data. Government data were available for three categories: local government jurisdictions, special-service districts, and school districts using the U.S. Census of Governments classification system. We restricted our analyses to those metropolitan statistical areas (MSAs) with a population greater than 250,000 (based on census estimates), of which 171 had information about the number of governments and special districts, and 161 had data on the number of school districts. Table 1 presents the data for the fifteen largest MSAs regarding the number of governments and special and school districts, demographic factors, and segregation as measured by the dissimilarity index (Acevedo-Garcia et al. 2003).¹ We derived our supplementary information primarily from publicly available data compiled and maintained by the Lewis Mumford Center at the University of Albany (<http://mumford.albany.edu/census/data.html>).

Our study outcome, mortality, was based on the availability of data and the usefulness of mortality as an overall indicator of life-course exposures known to be spatially patterned (McGinnis and Foege 1993; Wunsch et al. 1996). Mortality data by race and sex are from the Compressed Mortality File data developed by the U.S. Centers for Disease

TABLE 1
 Characteristics of the Largest Fifteen Metropolitan Areas, 1997

MSA	Number of Governments	Number of Special Districts	Number of School Districts	Percent Black, 2000	Percent under 5 Years, 1996	Percent over 65 Years, 1996	Population, 1997	Population Density / Square Mile	Dissimilarity Index, 2000
New York	204	65	56	23.8	7.2	13.4	19,876,488	1,955.3	81.8
Los Angeles	387	196	102	10.0	9	10.2	15,608,886	459.5	67.5
Chicago	1,492	662	366	19.0	8.1	11.3	8,642,175	1,247	80.8
Washington, DC	168	49	5	26.7	7.1	10.3	7,206,517	752.4	63.1
San Francisco	191	111	46	5.7	7.4	11.7	6,700,753	909.4	60.9
Philadelphia	867	296	209	20.4	7.1	13.8	5,971,860	1,006	72.3
Boston	991	409	191	7.3	6.5	13.2	5,827,654	903.5	65.7
Detroit	378	44	116	23.0	7	11.9	5,438,756	828.3	85
Dallas	332	98	81	15.3	8.3	8.5	4,683,013	514.4	59.4
Houston	803	669	49	17.6	8.5	7.4	4,320,041	560.6	67.5
Atlanta	265	109	29	29.2	7.6	7.9	3,627,184	592.1	65.6
Miami	36	6	2	19.9	6.9	16.9	3,515,358	1,114.7	73.6
Seattle	289	191	39	5.2	7	10.6	3,367,872	466.2	49.6
Riverside, CA	339	223	66	8.1	9.9	11.2	3,063,608	112.3	46.3
Cleveland	357	55	96	18.9	6.7	14.3	2,908,439	805.1	77.3

Note: Of the 171 MSAs with available data on the numbers of governments and special districts with a population over 250,000 that we used in our analysis, 161 had data on the number of school districts.

Control and Prevention. The Compressed Mortality File (CMF) data set is a county-level national mortality and population database for the years 1968 to 2004. To match the county data to metropolitan areas, we assigned counties in the CMF data set to the corresponding MSA or primary metropolitan statistical area (PMSA) for the year 1999, using the census bureau's county codes and MSA / PMSA codes (U.S. Bureau of the Census 1999). We then aggregated the mortality and population-count data across all the counties within a given MSA. Because the data on the number of governments were available only for 1997, we limited our analyses to mortality data for the years 1996, 1997, and 1998, aggregating them over these years to increase reliability. We made separate counts of mortality for each county, by race (black and white) and sex (male and female), and in each of the following age groups: 0 to 1 year, 1 to 4 years, 5 to 24 years, 25 to 44 years, 45 to 64 years, 65 to 74 years, and ≥ 75 years.

The key association of interest was between the black-white mortality ratio and the number of total governments for MSAs with a population of at least 250,000. We used sex-specific linear regression models to estimate the ratio of race-specific mortality rates, by major age-categories, as a function of each of the three fragmentation indicators: number of governments, number of special districts, and number of school districts. Because the extent of metropolitan fragmentation could be related to other macrolevel factors, we used regression models to control for the total population of the MSA, its population density, the proportion of its black population, the percentage of its population under five years and over sixty-five years, and the black-white poverty ratio. Measures were chosen for conceptual reasons and were included after examination of their correlations with the fragmentation measures and black-white mortality ratios. Measures that showed significant or substantial correlations with at least two of the three fragmentation indicators were retained for inclusion in all models. Similar models were run for race-specific mortality rates for age categories of interest. We performed all our analyses using the SAS version 9.2 programming language (SAS Institute Inc., Cary, NC).

Findings

The metropolitan areas varied considerably in the number of their governments, special districts, and school districts. The mean number of

governments was 167, SD = 193 (median = 105, IQR = 62 to 197), with Anchorage having the fewest (N = 4) and Chicago having the most (N = 1,492). The mean number of special districts was 72, SD = 97 (median = 44, IQR = 24 to 79), with the fewest in Jersey City (N = 2) and the most in Houston (N = 669). The mean number of school districts was 33, SD = 44 (median = 19, IQR = 7 to 46), with Reno having the lowest number (N = 1) and Chicago having the highest (N = 366).

Table 2 gives the numbers and rates of deaths for the period 1996 to 1998 in the 171 metropolitan areas used for analysis, separately for each age group, by race and by sex. Blacks' mortality rates are more than twice as high as those of whites aged 0 to 64. Black and white mortality rates appear to converge only after age 65. The female advantage in mortality rates is evident throughout the age span, especially after age 65.

Table 3 shows the results of the regression analyses of the association among number of governments, special districts, and school districts and also of the black/white mortality ratio by age group and gender. The estimated parameters represent the change in the black/white mortality ratio associated with a difference of 100 governments, special districts, or school districts. In every case, greater fragmentation is associated with increases in the black/white mortality ratio. All these increases are statistically significant for males aged 5 to 64, regardless of the measure of fragmentation. This is largely true for females as well, except that the estimates fall marginally short of statistical significance with the numbers of special districts. Above age 64, there is no strong or significant association for any of the fragmentation measures. The number of children under age 5 is strongly associated with the number of school districts, but they are not reliably estimated, owing to the small sample sizes.

More specifically, the differences among the 100 governments is associated with a significant 11 percent (95% C.I. 5%–17%) and 6 percent (95% C.I. 0%–12%) increase in the ratio of black-white mortality for males and females aged 5 to 24, respectively. Estimates are similar (males: 9%, 95% C.I. 5%–14%; females: 8%, 95% C.I. 2%–13%) for ages 25 to 44, and fall off by ages 45 to 64 to 4 percent and 3 percent, respectively. Increases in the number of special districts are also significantly associated with increases in the ratio of black-white mortality for males ages 5 to 24 (14%, 95% C.I. 1%–26%), 25 to 44 (11%, 95% C.I. 2%–21%), and 45 to 64 (7%, 95% C.I. 0%–13%). While similar in magnitude, there were no significant associations between special

TABLE 2
 Numbers and Rates of Deaths from 1996 to 1998 in 171 Metropolitan Areas, by Age and Race and by Age and Sex

Age (years)	By Race					
	Blacks			Whites		
	Deaths	Population	Mortality Rate / 1,000 Population	Deaths	Population	Mortality Rate / 1,000 Population
0-1	130	9,110	14.3	227	39,143	5.8
1-4	20	36,175	0.6	44	152,222	0.3
5-24	135	169,083	0.8	314	733,031	0.4
25-44	496	157,563	3.1	1,219	882,698	1.4
45-64	965	84,756	11.4	3,502	577,363	6.1
65-74	797	23,354	34.1	4,641	192,905	24.1
75+	1,373	16,374	83.9	13,292	166,542	79.8

Age (years)	By Sex					
	Female			Male		
	Deaths	Population	Mortality Rate / 1,000 Population	Deaths	Population	Mortality Rate / 1,000 Population
0-1	158	23,583	6.7	198	24,671	8.0
1-4	28	91,968	0.3	36	96,429	0.4
5-24	125	441,232	0.3	324	460,883	0.7
25-44	564	521,566	1.1	1,150	518,695	2.2
45-64	1,753	342,114	5.1	2,714	320,005	8.5
65-74	2,397	120,353	19.9	3,041	95,906	31.7
75+	8,704	117,232	74.2	5,962	65,685	90.8

TABLE 3
Increase in Black/White All-Cause Mortality Ratio Associated with Increased Fragmentation Measures

Age Group (years)	Males			Females		
	Estimate	95% C.I.	p-value	Estimate	95% C.I.	p-value
0-1	0.05	(-0.03, 0.12)	0.223	0.03	(-0.07, 0.12)	0.575
1-4	0.08	(-0.03, 0.18)	0.145	0.04	(-0.18, 0.26)	0.739
5-24	0.11	(0.05, 0.17)	0.001	0.06	(0.00, 0.12)	0.047
25-44	0.09	(0.05, 0.14)	<.0001	0.08	(0.02, 0.13)	0.011
45-64	0.04	(0.01, 0.07)	0.008	0.03	(0.00, 0.06)	0.067
65-74	0.01	(-0.01, 0.03)	0.416	0.01	(-0.01, 0.03)	0.560
>= 65	0.00	(-0.01, 0.02)	0.836	0.00	(-0.01, 0.01)	0.960
		Number of Special Districts				
0-1	0.05	(-0.11, 0.20)	0.558	0.01	(-0.17, 0.19)	0.906
1-4	0.14	(-0.06, 0.35)	0.169	0.02	(-0.41, 0.45)	0.930
5-24	0.14	(0.01, 0.26)	0.032	0.10	(-0.02, 0.21)	0.096
25-44	0.11	(0.02, 0.21)	0.015	0.09	(-0.02, 0.21)	0.106
45-64	0.07	(0.00, 0.13)	0.040	0.06	(0.00, 0.12)	0.060
65-74	0.02	(-0.01, 0.06)	0.204	0.02	(-0.02, 0.06)	0.321
>= 65	0.01	(-0.02, 0.04)	0.373	0.01	(-0.02, 0.03)	0.532
		Number of School Districts				
0-1	0.22	(-0.14, 0.57)	0.229	0.15	(-0.28, 0.58)	0.496
1-4	0.42	(-0.02, 0.86)	0.063	0.29	(-0.75, 1.32)	0.584
5-24	0.48	(0.19, 0.77)	0.001	0.22	(-0.05, 0.48)	0.108
25-44	0.52	(0.32, 0.72)	<.0001	0.38	(0.12, 0.64)	0.005
45-64	0.19	(0.04, 0.33)	0.013	0.09	(-0.06, 0.23)	0.242
65-74	0.02	(-0.06, 0.10)	0.596	0.01	(-0.08, 0.10)	0.840
>= 65	-0.02	(-0.09, 0.04)	0.534	-0.01	(-0.07, 0.04)	0.611

Notes: Models adjust for percent black, population density, population size, percent of population under age 5, percent of population over age 65, and black-white percent poverty ratio. Estimates reflect the increase in the black/white all-cause mortality ratio associated with an increase of 100 in the number of governments, school districts, or special districts.

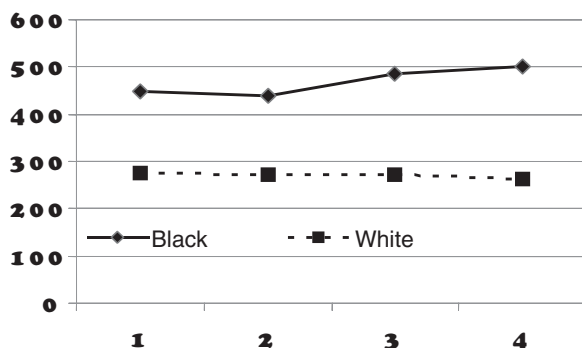


FIGURE 1. Black and White Mortality Rates / 100,000 (Ages 25 to 64) by Number of Governments (Quartiles)

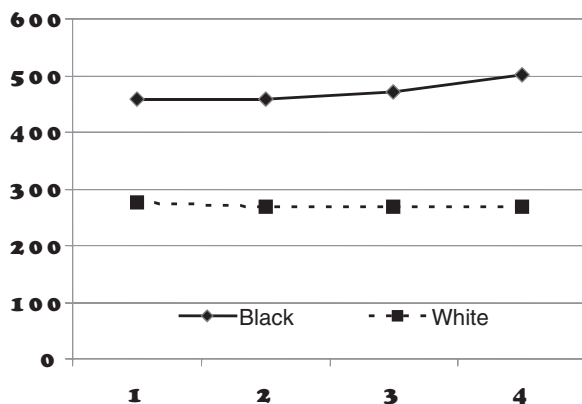


FIGURE 2. Black and White Mortality Rates / 100,000 (Ages 25 to 64) by Number of Special Districts (Quartiles)

districts and the black-mortality ratio for females. Increases in the number of school districts are associated with statistically significant increases in the ratio of black-white mortality for both males and females aged 25 to 44 (52%, 95% C.I. 32%–72% for males; 38%, 95% C.I. 12%–64% for females). Significant associations were also found for males aged 5 to 24 (48%, 95% C.I. 19%–78%) and those aged 45 to 64 (19%, 95% C.I. 4%–33%).

We examined further the effects of fragmentation on race-specific mortality rates for those aged 25 to 64, for whom the effects of fragmentation were generally the most evident. Figures 1, 2, and 3 are plots of

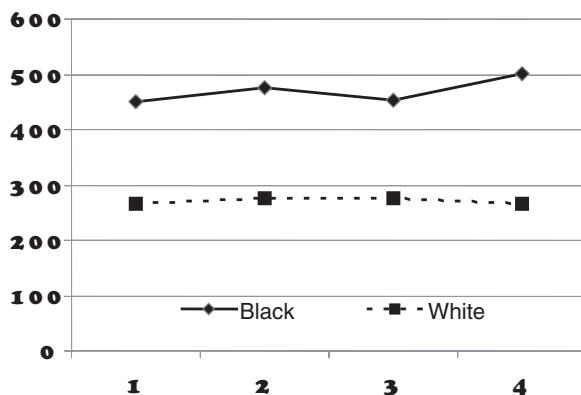


FIGURE 3. Black and White Mortality Rates / 100,000 (Ages 25 to 64) by Number of School Districts (Quartiles)

black and white all-cause mortality age-adjusted rates / 1,000 for those aged 25 to 64 by quartiles of the three fragmentation measures. The rates are adjusted for gender, percentage black, population size, population density, percentage under age 5 and over age 6, and black-white poverty ratio. There is a clear trend toward increasing mortality with increasing fragmentation for blacks, with an approximately 9 percent increase from the lowest quartile to the highest for all three indicators. There is virtually no change by quartile of fragmentation for whites.

Discussion

Our findings suggest a link between a metropolitan area's fragmentation and the differences in mortality between blacks and whites for children and working-age adults. While our findings of an association do not constitute proof of a causal association between metropolitan fragmentation and racial disparities in mortality, they do suggest that research is needed to understand the ways in which governance can positively or negatively influence population health and create conditions that exacerbate health disparities. Previous research has shown that where individuals live and grow up can determine their access to health care, economic opportunities, and lack of such critical resources as quality housing and educational opportunities, all of which can directly or indirectly influence their health (Cummins, et al. 2007; Kaplan 2009;

LaVeist 1993; Morenoff et al. 2007; Schulz et al. 2002). We know that the spatial structure—the way that urban public space is developed and arranged within a metropolitan area—is determined by the actions of the governmental institutions—such as planning agencies, redevelopment authorities, and economic development districts—that create the regulations and policies regarding public services and physical infrastructure (Anas, Arnott, and Small 1997). We also know that numerous governmental jurisdictions within a specific metropolitan area can lead to an uncoordinated delivery of public services across the region and can also result in competition among municipalities for businesses and the most affluent residents. History has shown us that when these conditions exist, the metropolitan area's more vulnerable and economically disadvantaged populations are adversely affected (Briggs 2005; Dreier, Mollenkopf and Swanstrom 2004; Massey 2008; Orfield and Luce 2010).

Our study is the first of its kind and thus has a number of limitations. First, fragmentation data with sufficient detail were available for only one point in time (1997). In order to have more confidence in our findings, we will have to examine other time periods and to clarify the lag times between change in governance and poorer health. More important, we will need to study in greater depth the metropolitan areas' specific public policies and institutions, regional dynamics, and other factors that contribute to metropolitan fragmentation. We need to understand the extent to which metropolitan fragmentation contributes to racial segregation, whether institutional racism contributes to both, and the role of poverty and antipoverty policies in reducing or exacerbating the consequences of metropolitan fragmentation. Furthermore, exactly how metropolitan fragmentation contributes to black-white mortality differentials remains to be discovered.

It is noteworthy that there is an association between fragmentation and mortality for blacks but not for whites. Because we adjusted for percentage black in the analyses, this difference in the results by race does not support the notion that high fragmentation is a marker for the proportion of the metropolitan population that is black. Moreover, in sensitivity analyses, we confirmed that the results were independent of race-specific poverty rates, an arguably better control for socioeconomic status, given the high prevalence of poverty among blacks.

Also noteworthy is the lack of association between metropolitan segregation and black/white differences in mortality for the oldest age groups (65 to 74 years; 75+ years). Some evidence suggests that even

though blacks have a higher mortality rate than whites in some elderly age groups, this excess mortality is negligible in the oldest of old and that in some instances, there is a cross-over effect, making mortality rates higher for whites (Hummer, Benjamins, and Rogers 2004; Johnson 2000; Manton, Poss, and Wing 1979). This heterogeneity in the direction and magnitude of the black/white mortality ratio may explain our null findings. In addition, individuals in the oldest age groups may be less dependent on area-based resources once they become eligible for Medicare. Owing to our limited data, we were unable to test these various explanations, and thus future research is necessary.

Future research must begin to uncover the pathways by which institutions influence the social, economic, and environmental conditions that contribute to the racial and ethnic health disparities in our nation's largest metropolitan areas. We believe that understanding these "upstream" determinants of the health of populations and disparities in health among subgroups in the overall population must be at the core of any attempt to reduce disparities in health and, furthermore, that bridges between urban planning and public health can contribute to these efforts.

Endnote

1. Dissimilarity is the evenness with which one racial population group is located (or segregated) within a metropolitan area with respect to another racial group. The dissimilarity statistic is interpreted as the proportion of one racial group that would need to relocate to another neighborhood (census tract) for that racial group to be distributed across the metropolitan area as a second racial group. See Diversitydata.org, Harvard School of Public Health and Center for Advancing Health, 2011.

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