

 COMMENTARY

# Why death haunts black lives

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In their article, Umberson et al. (1) demonstrate that African Americans are much more likely than whites to experience deaths in their immediate family circle, and that this elevated exposure to death occurs at virtually all stages of the life cycle. Differential exposure to bereavement by race is likely to contribute to long-standing black–white differentials with respect to health and socioeconomic status more generally. As the authors note, human well-being across a range of dimensions is well known to be adversely affected by exposure to the stress of bereavement.

## Black Residential Segregation

The marked exposure of blacks to death comes as no surprise to me, given my own research on racial residential segregation. Research increasingly points to segregation as the principal structural feature of US society responsible for the perpetuation of black disadvantage (2, 3). At present, more than half of all black metropolitan residents live under conditions of high residential segregation, and a third live under conditions of hypersegregation (4). High segregation is defined by a black–white residential dissimilarity index of 60 or greater (on a scale where 0 is complete integration and 100 is total segregation), and hypersegregation refers to an intense form of segregation characterized by high indices (above 60) on at least four of the five constituent dimensions of geographic inequality, which are unevenness, isolation, clustering, concentration, and centralization (5). The nation's hypersegregated metropolitan areas presently include Baltimore, Boston, Chicago, Cleveland, Detroit, Flint, Kansas City, Milwaukee, New York, Philadelphia, and St. Louis, among others (6). In these metropolitan areas, blacks display substantially diminished life chances compared with whites and other groups.

No other group in the history of the United States has ever experienced the degree of segregation that has routinely been visited upon African Americans since the early 20th century (7). Segregation persists today not simply as a holdover from a racist past but as an outcome that is actively produced by racialized behaviors, institutionalized practices, and prejudicial public policies that prevail in many metropolitan areas

(8). This fact is important because the residential segregation of any group with a high rate of poverty (such as blacks) inevitably concentrates poverty and its correlates spatially to create a uniquely dangerous and disadvantaged social environment (9).

Affluence offers African Americans little protection from the predations of segregation. Indeed, blacks in the top quintile of income distribution are more segregated than Hispanics in the bottom quintile (10). As a result, in addition to the discrimination, exclusion, and stigma that African Americans individually encounter as they navigate American society, blacks of all social classes are exposed to levels of neighborhood crime and violence that few other Americans ever encounter (11). Even the richest African Americans experience more spatially concentrated disadvantage than the poorest whites, Asians, or Hispanics (12).

## The Consequences of Segregation

The spatial concentration of disadvantage, in turn, predicts a plethora of other maladies, including high rates of violence, crime, infant mortality, and homicide and low levels of life expectancy, public trust, interpersonal connection, and political efficacy (13). In addition, black neighborhoods are far more likely than other areas to contain toxic environmental hazards (14, 15). By systematically exposing them to uniquely high levels of disorder, violence, and toxicity, racial segregation functions malevolently to get “under the skin” of African Americans to compromise health and well-being through a series of increasingly well-understood biosocial pathways (16).

First, prolonged exposure to spatially concentrated deprivation increases the allostatic load routinely experienced by African Americans. Allostasis refers to the human body's proclivity to maintain stability and ensure survival through autonomic physiological changes in response to threats in the environment (17). The repeated activation of the hypothalamic–pituitary–adrenal axis in response to the disorder and violence that prevail in poor black neighborhoods raises the average allostatic load of residents by secreting excess amounts of adrenaline, fibrinogen, and cortisol into the bloodstream (18,

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19), which, over time, increase the risk of hypertension, cardiovascular disease, diabetes, inflammatory illnesses, autoimmune disorders, and other physical ailments (20). In addition, exposure to spatially concentrated disadvantage undermines memory and attention to impair cognitive functioning and mental health (21, 22).

A second pathway connects neighborhood poverty to reduced black health and welfare through the shortening of human telomeres, which are repetitive nucleotide sequences located at the ends of chromosomes that act as buffers to protect genetic material from deterioration and errant recombination during cell division (23). Telomeres naturally shorten in the course of aging; but this normal process of shortening is accelerated by exposure to environmental stressors (24). According to Blackburn et al. (25), “telomere attrition can lead to potentially maladaptive cellular changes, block cell division, and interfere with tissue replacement,” and “greater overall telomere attrition predicts mortality and age-related diseases.” Recent research suggests that the unique exposure of African Americans to stressful neighborhood circumstances indeed acts to shorten telomeres to put blacks at greater risk of morbidity and mortality throughout life (26–28).

A final pathway by which neighborhoods influence individual life chances is through gene–environment interactions in which exposure to the same environmental circumstances yields different outcomes depending on which variants of a gene one carries (29). One study found, for example, that exposure to social disadvantage reduced telomere length among young black males, but that the effect was mediated by a specific set of alleles for serotonin and dopamine that made individuals more or less susceptible to environmental influences. Those with greater genetic sensitivity displayed shorter telomeres than average when exposed to a disadvantaged environment but longer telomeres when exposed to an advantaged environment (30). Another study examined the combined effect of carrying the DRD4 long allele for dopamine (which heightens sensitivity to attractive circumstances) and the 5-HTTLPR short allele for serotonin (which increases sensitivity to aversive conditions) and found that exposure to disadvantaged circumstances produced more aggression among those with the sensitive genotypes but less aggression among those without the sensitive alleles (31).

A key means by which environmental circumstances affect gene expression is through a process known as methylation—the addition of a methyl group to the 5 position of a cytosine pyrimidine ring (a point where cytosine and guanine are separated by a single phosphate), which inhibits genetic expression of that segment of the DNA even though it does not change the underlying DNA sequence itself (32, 33). Recent work suggests that exposure to disadvantage can influence the process of methylation in significant ways. Children raised in orphanages, for example, display higher levels of methylation than those raised by biological parents (34), and, compared with individuals born into advantaged neighborhoods, those from disadvantaged neighborhoods displayed higher rates of methylation at birth of the MEG3 gene, a maternally expressed, imprinted, long noncoding RNA gene which has been linked to various kinds of cancer (35).

In sum, a growing body of evidence suggests that black and white Americans experience very different health and mortality outcomes throughout the life course, outcomes that occur not simply because blacks have lower levels of education, income, and wealth than whites but because they experience radically more disadvantaged neighborhood circumstances irrespective of the socioeconomic status they achieve. Owing to the persistence of high levels of black segregation in the United States, neighborhood disadvantage remains the critical nexus through which black poverty is transmitted and reproduced across lives and between generations (36).

Umberson et al. (1) clearly identify excess mortality within the black family as an important but heretofore overlooked source of racial disadvantage in the United States, but we must bear in mind that it is but one of a multitude of inequality-producing mechanisms rooted in continuing residential segregation of African Americans in the United States. Now, as in the past, residential segregation continues to serve as the linchpin of the American system of racial stratification (37).

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