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Racial disparities in self-rated health: Trends, explanatory factors, and the changing role of socio-demographics

Audrey N. Beck [a,*], Brian K. Finch [b], Shih-Fan Lin [a], Robert A. Hummer [c], Ryan K. Masters [d]

[a] San Diego State University, San Diego, CA 92123, USA
[b] University of Southern California, USA
[c] University of Texas at Austin, USA
[d] University of Colorado at Boulder, USA

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ABSTRACT

Abstract: This paper uses data from the U.S. National Health Interview Surveys (N = 1,513,097) to describe and explain temporal patterns in black-white health disparities with models that simultaneously consider the unique effects of age, period, and cohort. First, we employ cross-classified random effects age–period–cohort (APC) models to document black-white disparities in self-rated health across temporal dimensions. Second, we use decomposition techniques to shed light on the extent to which socio-economic shifts in cohort composition explain the age and period adjusted racial health disparities across successive birth cohorts. Third, we examine the extent to which exogenous conditions at the time of birth help explain the racial disparities across successive cohorts. Results show that black-white disparities are wider among the pre-1935 cohorts for women, falling thereafter; disparities for men exhibit a similar pattern but exhibit narrowing among cohorts born earlier in the century. Differences in socioeconomic composition consistently contribute to racial health disparities across cohorts; notably, marital status differences by race emerge as an increasingly important explanatory factor in more recent cohorts for women whereas employment differences by race emerge as increasingly salient in more recent cohorts for men. Finally, our cohort characteristics models suggest that cohort economic conditions at the time of birth (percent large family, farm or Southern birth) help explain racial disparities in health for both men and women.

Introduction

One of the most disconcerting findings with regards to health disparities is the persistent black–white gap in U.S. morbidity and mortality. Despite declining morbidity and mortality over time, researchers continue to find persistent and significant racial gaps for a host of outcomes, including: self-rated health (SRH), chronic conditions, disability, overall life expectancy, and age- and cause-specific mortality (Geronimus, Bound, Keene, & Hicken, 2007; Hayward, Miles, Crimmins, & Yang, 2000; Hummer & Chinn, 2011; Williams & Sternthal, 2010). Such disparities are well documented on a year-to-year basis (e.g., Harper, Lynch, Burris, & Smith, 2007; Macinko & Elo, 2009) and have also increasingly been tied to life course processes that unfold by age (Geronimus et al., 2010; Jackson et al., 2011; Walsemann, Geronimus, & Gee, 2008). Very little attention in this literature, however, has been given to possible cohort-based differences in health disparities; that is, are black–white gaps in health structured by the cohorts into which individuals are born, in addition to the effects of period factors and aging processes? Further, to what extent can we explain cohort disparities with extant explanations of racial inequality (e.g. socioeconomic conditions)? Addressing these limitations, the intent of this paper is to describe black–white health disparities in the United States using modeling techniques that simultaneously estimate the independent effects of age, period, and cohort. Second, we further attempt to explain cohort-based changes in the race disparity using cohort-based variables.

Age, period and cohort

As an indicator of the internal physiological change due to accumulated exposure to pathogens, genetic manifestation of disease, and the biological breakdown of the human body (Yang & Land, 2006), the effect of aging has been the focus of much research on population health disparities (e.g., Manton & Gu, 2001). However, the persistence of health disparities over time suggests that *period effects*, temporal social contexts (e.g. historical events) that affect all age groups simultaneously, and *cohort effects*, unique

* Corresponding author.
E-mail address: abeck@projects.sdsu.edu (A.N. Beck).

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conditions attributed to individuals within defined birth-year groupings, also play crucial roles. Cohort differences in health also reflect social change and have been attributed to disparate early life experiences and lifetime exposures to pathogens, improvements in nutrition, and advances in health knowledge and medical technologies (Finch & Crimmins, 2004; Fogel, 2005; Manton, Stallard, & Corder, 1997; Masters, 2012; Ryder, 1965; Yang, 2008a). Indeed, rapid and unequal historical changes in educational attainment, family formation, changes in lifestyle (e.g. smoking prevalence) (Preston & Wang, 2006), and labor market participation (Bauman & Graf, 2003, pp. 1–12; Escobedo & Peddicord, 1996; Mosisa & Hipple, 2006; Waite, 1995) have implications for health disparities. However, health disparities within even very new (and young) birth cohorts, such as the racial gaps in low birth weight and infant mortality (Powers, 2013; Powers, Solis, Frisbie, Hummer, & Pullum, 2006; Powers & Song, 2009), imply within-cohort variation in exposures.

Each temporal dimension has a potentially dynamic and unique effect on population health and assessing the impact of one temporal dimension while controlling for other dimensions is essential to understanding temporal changes in health (Masters, 2012; Ryder, 1965; Yang, 2008a). Specifically, analytically omitting cohorts results in model misspecification and potentially biases aging and period temporal trends (Reither, Hauser, & Yang, 2009). There is evidence of cohort influences, modeled within an age–period–cohort (APC) framework, on measures of health such as SRH (Zheng, Yang, & Land, 2011), disability (Lin, Beck, Finch, Hummer, & Masters, 2012), obesity (Reither et al., 2009) and mortality (Masters, 2012; Yang, Fu, & Land, 2004). To date, however, there has been less focus on racial disparities and explaining cohort change, emphasizing the need to fill those gaps using an APC framework. Next, we briefly discuss the importance of SRH as a measure of population health and health disparities.

Trends and disparities in self-rated health

We chose SRH for several reasons: (1) studies show that a poor or fair SRH has strong predictive value for subsequent mortality above and beyond clinical assessments (Benyamini & Idler, 1999; Idler & Benyamini, 1997); (2) although evidence that SRH is associated with specific disease outcomes is limited (Ferraro, Farmer, & Wybraniec, 1997; Menec, Chipperfield, & Perry, 1999), other studies suggest that SRH is associated with current morbidity (Ferraro & Farmer, 1999) and subsequent functional decline and disability (Idler & Angel, 1990); and (3) SRH is often more sensitive to change in response to external factors than are physiologic parameters. Additionally, black and white men and women who report fair/poor SRH have similar mortality risks (McGee, Liao, Cao, & Cooper, 1999), suggesting that our use of this measure for analyses of racial health disparities is valid. We now summarize extant research on the temporal dimensions of SRH, highlighting research which has used an APC approach.

Research suggests that SRH declines with age (Hill & Needham, 2006; McCullough & Laurenceau, 2004) or exhibits a nonlinear decline with improvements at older ages (Zack, Moriarty, Stroup, Ford, & Mokdad, 2004; Zheng et al., 2011). Willson, Shuey, and Elder (2007) found that cohort variation in SRH also declined with age; older cohorts reported better initial health, but more rapid declines than more recent cohorts. Women tend to have worse SRH than men, with greater within-group variation at all ages (Zheng et al., 2011). Although there is some evidence of gender convergence (Ross & Bird, 1994) and racial divergence (Yao & Robert, 2008) in SRH with age, Yang and Lee (2009) found, after accounting for cohort effects, persistent race and gender gaps over the life course.

There are mixed findings for SRH period trends, due, in part, to differences in data source or the measurement of SRH. Hill and Needham (2006) found improvements over time in SRH for women, but a nonlinear pattern for men using the General Social Survey. Salomon, Nordhagen, Oza, and Murray (2009), used the National Health Interview Survey (NHIS) and found that poor/fair SRH declined during the 1980s, increased during the early 1990s, only to flatten out after a sharp decline in 1997, simultaneous with a redesign of the survey. Zack et al. (2004) found a similar increase in fair/poor SRH during the early 1990s using the Behavioral Risk Factor Surveillance System; however, their findings suggested that these increases continued through the remainder of the 1990s. Using the NHIS and APC models, Zheng et al. (2011) found slight cyclical increases in SRH before 1998 with significant declines thereafter; this trend was similar among both men and women. Relevant to our focus on racial disparities, one study found that blacks experienced steeper declines in poor/fair SRH than Non-Hispanic whites, resulting in a narrowing period disparity (Salomon et al., 2009). Zheng et al. (2011) found narrowing variation in mean SRH differences, though this is not specific to certain groups (e.g. race/ethnic groups) but rather all variation.

With few exceptions, the cohort temporal dimension of SRH has been neglected. In a community study, Chen, Cohen, and Kasen (2007) compared baby boom women to pre-boomers and found that baby boomers reported overall lower SRH. In contrast, using APC methods, Zheng et al. (2011) found that later baby boom cohorts (1955–1964) had better SRH than other cohorts. Men showed relatively flat cohort trends with the exception of higher SRH among baby boom cohorts; women, in contrast, showed overall worse SRH with declines through the early baby boom cohort (1945–1954) and increases thereafter. Disparities (within cohort variation, not group-specific) decreased through the 1925–1929 cohort, leveled off through WW II cohorts, decreased during baby boom cohorts, and increased among more recent cohorts. These disparities were similar when examined by gender, except that men exhibited substantial declines for the Great Depression through the baby boom cohorts (Zheng et al., 2011). Yang and Lee (2009) find evidence that racial gaps in SRH have diverged for more recent cohorts, but did not examine how this may additionally vary by gender. Within a cohort, however, these gaps do not vary by age and are argued to be attributable to mean cohort differences in characteristics such as socioeconomic status (SES), marital status and other health conditions (Yang & Lee, 2009). Only when the separate effects of age, period, and cohort are estimated simultaneously can we begin to uncover the sources of health disparity trends.

Explanations of racial disparities in health

It has been argued that race in the United States is "an important marker of differential access to societal resources and rewards, and health status is no exception" (Williams, 2005; 53; also see LaVeist, 1994). Although some research suggests that race/ethnic disparities in health and mortality are completely accounted for by individual differences in SES (Rogers, 1992), most studies indicate otherwise—that is, that health disparities are substantially reduced but not completely eliminated (Crimmins, Hayward, & Seeman, 2004; House & Williams, 2000; Hummer & Chinn, 2011; Link & Phelan, 1995). Other contributors to persistent disparities include residential context and job availability and quality (Huffman & Cohen, 2004), differential rates of risky health behaviors (Finch, Frank, & Hummer, 2000; Lantz et al., 2001), discrimination and discrimination-related life course stress (Gee & Ford, 2011; Geronimus et al., 2010; LaVeist, 2000; Sternthal, Slopen, & Williams, 2011; Williams, Neighbors, & Jackson, 2003), differential incarceration (Schnittker, Massoglia, & Uggen, 2011), and racial residential segregation (House, 2002; Williams & Collins, 2001). In fact, one recent study (Do et al., 2008) confirmed the growing supposition that race is a proxy for exposure to differential social