RESEARCH LETTER

Trends in the Black-White Life Expectancy Gap, 2003-2008

To the Editor: Understanding the causes of black-white differences in mortality has important consequences for interventions to reduce health inequalities in the United States. A previous report found a nearly 2-year decline in the black-white life expectancy gap among men and a 1-year decline among women between 1993 and 2003.[1] We investigated whether these changes have continued in recent years.

Methods. Similar to a previous study,[1] we abstracted data on deaths and population from the US National Vital Statistics System by age and cause of death for non-Hispanic blacks and whites in 2003 and 2008. We used the Centers for Disease Control and Prevention's WONDER software[2] and abridged life table methods to estimate life expectancy at birth, and used the method by Arriaga[3] for decomposing differences in life expectancy between populations by age and cause of death. We selected *International Classification of Diseases, Tenth Revision* codes to capture leading causes of death among sex and race groups, and calculated age-adjusted death rates using the US 2000 standard million

Table 1. Causes of Death Contributing to the Gap in Life Expectancy at Birth Between Non-Hispanic Blacks and Whites by Sex in 2003 and 2008[a]

	Life Expectancy Gap, y (% of Contribution)					
	Men			Women		
Cause of Death	2003	2008	Change From 2003 to 2008[b]	2003	2008	Change From 2003 to 2008[b]
Cardiovascular	1.94 (29.7)	1.75 (32.2)	–0.18 (17.0)	1.94 (41.8)	1.60 (43.2)	–0.34 (35.9)
Heart disease	1.35 (20.7)	1.19 (21.9)	–0.16 (14.7)	1.36 (29.3)	1.08 (29.3)	–0.27 (29.3)
Hypertension	0.15 (2.2)	0.16 (3.0)	0.02 (–1.6)	0.16 (3.5)	0.18 (4.8)	0.01 (–1.4)
Stroke	0.41 (6.2)	0.37 (6.8)	–0.04 (3.5)	0.38 (8.2)	0.31 (8.5)	–0.07 (7.3)
Other[c]	0.03 (0.5)	0.03 (0.5)	0 (0.4)	0.03 (0.7)	0.03 (0.7)	–0.01 (0.7)
Cancers	0.99 (15.1)	0.89 (16.4)	–0.09 (8.4)	0.56 (12.2)	0.51 (13.7)	–0.06 (6.3)
Colorectal	0.12 (1.9)	0.14 (2.6)	0.02 (–1.6)	0.13 (2.8)	0.11 (2.9)	–0.02 (2.3)
Lung	0.29 (4.4)	0.22 (4.1)	–0.07 (6.1)	–0.03 (–0.7)	–0.07 (–1.8)	–0.03 (3.6)
Breast	0 (0)	0 (0.1)	0 (–0.2)	0.20 (4.3)	0.21 (5.6)	0.01 (–0.6)
Prostate	0.27 (4.1)	0.26 (4.7)	–0.01 (1.1)	0	0	0
Other[c]	0.30 (4.6)	0.27 (4.9)	–0.03 (3.1)	0.27 (5.8)	0.26 (7.0)	–0.01 (1.0)
Communicable	0.93 (14.2)	0.73 (13.4)	–0.20 (18.6)	0.58 (12.5)	0.51 (13.7)	–0.07 (7.9)
Influenza/pneumonia	0.10 (1.6)	0.08 (1.4)	–0.02 (2.2)	0.03 (0.6)	0.04 (1.2)	0.02 (–1.8)
Septicemia	0.19 (2.9)	0.18 (3.3)	–0.01 (0.6)	0.20 (4.3)	0.20 (5.4)	0 (0)
HIV	0.57 (8.8)	0.41 (7.5)	–0.16 (14.9)	0.32 (6.8)	0.25 (6.6)	–0.07 (7.6)
Other[c]	0.07 (1.0)	0.06 (1.0)	–0.01 (0.9)	0.04 (0.8)	0.02 (0.5)	–0.02 (2.1)
Chronic disease	0.54 (8.3)	0.42 (7.7)	–0.12 (11.1)	0.44 (9.4)	0.28 (7.6)	–0.15 (16.4)
Alzheimer disease	–0.02 (–0.3)	–0.03 (–0.6)	–0.02 (1.6)	–0.08 (–1.7)	–0.10 (–2.7)	–0.02 (2.4)
CLRD	–0.03 (–0.4)	–0.08 (–1.4)	–0.05 (4.7)	–0.23 (–4.9)	–0.28 (–7.6)	–0.05 (5.5)
Diabetes	0.32 (4.8)	0.30 (5.5)	–0.02 (1.4)	0.47 (10.2)	0.40 (10.7)	–0.07 (7.9)
Nephritis	0.25 (3.8)	0.25 (4.6)	0 (0)	0.27 (5.9)	0.30 (8.0)	0.02 (–2.5)
Cirrhosis	0.02 (0.3)	–0.02 (–0.4)	–0.04 (3.3)	0 (–0.1)	–0.03 (–0.9)	–0.03 (3.1)
Injuries	0.91 (14.0)	0.61 (11.1)	–0.30 (28.0)	0.03 (0.7)	–0.12 (–3.2)	–0.15 (16.2)
Homicide	1.08 (16.6)	1.03 (18.8)	–0.06 (5.2)	0.17 (3.6)	0.14 (3.8)	–0.03 (2.8)
Suicide	–0.21 (–3.3)	–0.27 (–4.9)	–0.05 (4.9)	–0.08 (–1.7)	–0.11 (–2.9)	–0.03 (3.2)
Unintentional injuries	0.04 (0.7)	–0.15 (–2.8)	–0.19 (17.9)	–0.06 (–1.2)	–0.15 (–4.1)	–0.10 (10.2)
Poisoning	0 (0.1)	–0.14 (–2.6)	–0.14 (13.1)	0.01 (0.2)	–0.08 (–2.3)	–0.09 (9.8)
Transportation-related	0.01 (0.2)	–0.01 (–0.2)	–0.02 (1.9)	–0.05 (–1.1)	–0.04 (–0.9)	0.02 (–2.0)
Other[c]	0.03 (0.5)	0 (0)	–0.03 (2.8)	–0.01 (–0.2)	–0.03 (–0.9)	–0.02 (2.4)
Infant mortality	0.51 (7.7)	0.45 (8.2)	–0.06 (5.3)	0.42 (9.0)	0.39 (10.5)	–0.03 (3.1)
Congenital anomalies	0.05 (0.8)	0.04 (0.7)	–0.02 (1.5)	0.04 (0.8)	0.04 (1.0)	0 (0)
Perinatal death	0.45 (6.9)	0.41 (7.5)	–0.04 (3.8)	0.38 (8.2)	0.35 (9.5)	–0.03 (3.1)
Residual[d]	0.72 (11.0)	0.59 (10.9)	–0.13 (11.6)	0.67 (14.4)	0.54 (14.5)	–0.13 (14.2)
Total	**6.53** (100)	**5.44** (100)	**–1.09** (100)	**4.64** (100)	**3.71** (100)	**–0.93** (100)

Abbreviations: CLRD, chronic lower respiratory disease; HIV, human immunodeficiency virus.
[a] Race and Hispanic origin are reported separately on the death certificate in accordance with standards set forth by the US Office of Management and Budget. Percentages may not sum to 100 due to rounding.
[b] Value in parentheses represents each cause's percentage contribution to the change in the black-white life expectancy gap.
[c] Subsume all other *International Classification of Diseases, Tenth Revision* codes for these broad causes of death.
[d] Includes other causes of chronic disease and injury.

population. The US mortality data are not subject to sampling error.[4] Analyses were conducted using Stata software version 12 (StataCorp). This study used deidentified data and did not require ethics review.

Results. Between 2003 and 2008, life expectancy at birth increased from 75.3 to 76.2 years among non-Hispanic white men and from 68.8 to 70.8 years among non-Hispanic black men, whereas for women the changes were from 80.3 to 81.2 years (non-Hispanic whites) and 75.7 to 77.5 years (non-Hispanic blacks). These changes reduced the racial gap from 6.5 to 5.4 years among men and from 4.6 to 3.7 years among women (TABLE 1). For men, heart disease (22%) and homicide (19%) were the leading contributors to the gap in 2008. For women, the leading causes were heart disease (29%) and diabetes (11%). However, the leading contributor to the 1.1-year decrease in the gap for men since 2003 was unintentional injuries (18% of the decrease), followed by human immunodeficiency virus (HIV, 15%) and heart disease (15%). Among women, heart disease was the dominant contributor to the decline (29%), followed by unintentional injuries (10%), HIV, diabetes, and stroke (approximately 8% each). Larger increases in poisoning mortality among whites were the primary reason why unintentional injuries reduced the racial gap. Age-adjusted rates of unintentional poisoning mortality among those aged 20 to 54 years increased by 58% and 74% for non-Hispanic white men and women, respectively, but only 0.1% and 9% among non-Hispanic blacks (TABLE 2).

Comment. Between 2003 and 2008, the gap in life expectancy between non-Hispanic blacks and whites declined by approximately 1 year for both sexes, a rate of decline that is equal to or greater than that observed over the entire decade from 1993-2003. These racial inequalities among men and women in 2008 are the lowest ever recorded in the United States.[5] Heart disease, diabetes, homicide, HIV, and infant mortality remain the chief causes of the black-white gap. However, in contrast to 1993-2003,[1] homicide has not played an important role in reducing black-white differences among men since 2003. Rather, changes in unintentional injury deaths were a major reason, along with heart disease and HIV, for the narrowing gap among both men and women.

Historically, motor vehicle crashes have been the leading cause of unintentional injury death in the United States, but racial differences are small and have been stable over recent years.[4] A potential explanation for the contribution of unintentional injury to the narrowing racial gap may be recent increases in poisoning mortality, which has now eclipsed motor vehicle crashes as the leading cause of injury death and has affected middle-aged white men more than any other group.[6]

Table 2. Age-Adjusted Death Rates for Causes of Unintentional Injury Mortality Among Non-Hispanic Blacks and Whites by Sex and Age in 2003 and 2008[a]

	Age-Adjusted Death Rate per 100 000 Population[b]					
	Non-Hispanic Black			Non-Hispanic White		
Cause of Death	2003	2008	Change (%)[c]	2003	2008	Change (%)[c]
Men						
All ages						
Unintentional injuries	53.89	49.72	–4.17 (–7.7)	52.23	56.92	4.69 (9.0)
Poisoning	10.10	11.49	1.39 (13.7)	9.92	15.97	6.05 (61.0)
Transportation-related	24.65	20.76	–3.89 (–15.8)	23.28	20.77	–2.51 (–10.8)
Other	19.15	17.47	–1.68 (–8.7)	19.03	20.19	1.16 (6.1)
Ages 20-54 y						
Unintentional injuries	58.43	52.49	–5.94 (–10.2)	54.85	62.83	7.98 (14.5)
Poisoning	16.15	16.17	0.02 (0.1)	17.46	27.62	10.15 (58.1)
Transportation-related	30.63	26.87	–3.76 (–12.3)	27.43	25.75	–1.68 (–6.1)
Other	11.65	9.45	–2.20 (–18.9)	9.96	9.46	–0.50 (–5.0)
Women						
All ages						
Unintentional injuries	21.76	20.13	–1.63 (–7.5)	25.21	27.79	2.58 (10.2)
Poisoning	4.22	5.03	0.81 (19.3)	4.82	8.39	3.57 (74.0)
Transportation-related	8.69	6.85	–1.84 (–21.2)	10.16	8.07	–2.09 (–20.6)
Other	8.85	8.25	–0.60 (–6.8)	10.23	11.33	1.10 (10.7)
Ages 20-54 y						
Unintentional injuries	20.19	18.77	–1.42 (–7.0)	21.21	25.66	4.45 (21.0)
Poisoning	7.16	7.81	0.65 (9.0)	8.15	14.15	6.00 (73.5)
Transportation-related	9.42	8.07	–1.35 (–14.3)	10.25	8.76	–1.50 (–14.6)
Other	3.60	2.89	–0.71 (–19.7)	2.80	2.75	–0.05 (–1.7)

[a] *International Classification of Diseases, Tenth Revision (ICD-10)* codes taken from National Center for Health Statistics list of 113 selected causes of death: unintentional injuries (codes V01-X59 and Y85-Y86); poisoning (codes X40-X49); transportation-related (codes V01-V99 and Y85); other (residual codes V01-X59 and Y85-Y86).
[b] Age-adjusted to the year 2000 US standard million (authors' calculations). Race and Hispanic origin were classified by the funeral director for death certificates and self-reported for population estimates, and were reported separately on the death certificate in accordance with standards set forth by the US Office of Management and Budget.
[c] Calculated as [(2008 rate – 2003 rate)/(2003 rate)] × 100.

Our analysis is limited by reliance on the underlying cause of death, which may underestimate the contribution of factors involved in multiple causes. The black-white life expectancy gap is still large, and declines since 2003 due to HIV and heart disease are a positive development, but rapid increases in accidental death among whites also have contributed to this change.

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1. Harper S, Lynch J, Burris S, Davey Smith G. Trends in the black-white life expectancy gap in the United States, 1983-2003. *JAMA*. 2007;297(11):1224-1232.
2. Centers for Disease Control and Prevention; National Center for Health Statistics. Compressed mortality file. http://wonder.cdc.gov/. Accessibility verified May 1, 2012.
3. Arriaga EE. Measuring and explaining the change in life expectancies. *Demography*. 1984;21(1):83-96.
4. National Center for Health Statistics. Table 37 (p 176) in Health, United States, 2010: with special feature on death and dying. http://www.cdc.gov/nchs/data/hus/hus10.pdf. Accessibility verified May 1, 2012.
5. Arias E, Rostron BL, Tejada-Vera B. United States life tables, 2005. *Natl Vital Stat Rep*. 2010;58(10):1-132.
6. Warner M, Chen LH, Makuc DM, Anderson RN, Miniño AM. Drug poisoning deaths in the United States, 1980–2008. http://www.cdc.gov/nchs/data/databriefs/db81.pdf. Accessibility verified May 1, 2012.

CORRECTION

Clarification of Conflict of Interest Disclosures: In a Viewpoint entitled, "Preventing Depression: A Global Priority," published in the March 14, 2012, issue of *JAMA* (2012;307[10]:1033-1034), the conflict of interest disclosure for Dr Reynolds should have read as follows: "Dr Reynolds reported receiving pharmaceuticals for research studies from Bristol-Myers Squibb, Forest, Pfizer, and Lilly; receiving grants from the National Institute of Mental Health, National Institute on Aging, National Center on Minority Health and Health Disparities, National Heart, Lung, and Blood Institute, the Commonwealth of Pennsylvania, the John A Hartford Foundation, and the American Foundation for Suicide Prevention; and serving on the American Association for Geriatric Psychiatry editorial review board." A letter regarding the correction appears in this issue. The article has been corrected online.