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Black Lives Matter: Differential Mortality and the Racial Composition of the U.S. Electorate, 1970-2004

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Abstract

Excess mortality in marginalized populations could be both a cause and an effect of political processes. We estimate the impact of mortality differentials between blacks and whites from 1970 to 2004 on the racial composition of the electorate in the US general election of 2004 and in close statewide elections during the study period. We analyze 73 million US deaths from the Multiple Cause of Death files to calculate: (1) Total excess deaths among blacks between 1970 and 2004, (2) total hypothetical survivors to 2004, (3) the probability that survivors would have turned out to vote in 2004, (4) total black votes lost in 2004, and (5) total black votes lost by each presidential candidate. We estimate 2.7 million excess black deaths between 1970 and 2004. Of those, 1.9 million would have survived until 2004, of which over 1.7 million would have been of voting-age. These resulted in 1 million black votes lost in 2004 and 900,000 votes lost by the defeated Democratic presidential nominee. We find that many close state-level elections over the study period would likely have had different outcomes if voting age blacks had the mortality profiles of whites. US black voting rights are also eroded through felony disenfranchisement laws and other measures that dampen the voice of the US black electorate. Systematic disenfranchisement by population group yields an electorate that is unrepresentative of the full interests of the citizenry and affects the chance that elected officials have mandates to eliminate health inequality.

Keywords: Race, Health Disparities, Premature Mortality, Electorate, Political Inequality, Voting, Health Policy

Introduction

In the United States, after centuries of *de jure* and *de facto* disenfranchisement of black Americans, the Voting Rights Act of 1965 resulted in a mass enfranchisement of poor and black Americans. Today, however, erosion of these rights – especially among disadvantaged groups – is a great and growing concern. Felony disenfranchisement laws in many states have a significant discriminatory impact on voting outcomes given race/ethnic variations in prosecution and sentencing of drug-related crimes (Manza & Uggen, 2006; Uggen et al., 2012). Partisan legislative redrawing of electoral boundaries that concentrate racial/ethnic groups into minority districts also has been shown to reduce the political influence of minorities (Epstein & O'Halloran, 1999; Trebbi et al., 2008). The trend toward shortened poll hours and more stringent voter ID policies in several states have had, or are anticipated to have, disproportionately negative effects on voting among the nonwhite, the poor, and the aged (Barreto, Nuno, and Sanchez 2009).

Another possible threat to the electoral power of black Americans is their shorter life expectancy relative to white Americans. To what extent could this disparity actually influence politics – and thereby policy – in the United States? This analysis attempts to answer that question by estimating the impact of mortality differentials between US blacks and whites from 1970 to 2004 on the racial composition of the electorate in the general election of 2004 and in close statewide elections during the study period.

While voting behavior is influenced by a range of forces, it is certainly true that the longer a person lives, the greater their opportunity to vote over their lifetime. Differential mortality by social group has been found to influence that nature of the electorate (and it is hypothesized) election outcomes in countries outside of the US (Dorling, 1998, 2010; Smith & Dorling, 1996). For example, members of the working class in the UK live an average of one

general election less than members of the middle or upper classes (McCartney et al., 2010). Many national UK general elections have been very closely fought battles and so this difference along with many other factors could have been very influential on past electoral outcomes in the UK. However, the possible impact of black excess mortality relative to whites on US election outcomes has not been examined.

Throughout the 20th century, the mortality rate of US blacks was, on average, about 60% greater than that of US whites (Kaufman et al., 1998). Although measureable improvements in black excess mortality were seen mid-century, black-white mortality disparities have changed little over recent decades. For instance, the age-sex standardized mortality rate for blacks was 1.47 in 1960 and 1.41 in 2000 (Satcher et al., 2005). These statistics suggest that significant black-white health and mortality differentials – and particularly the excess mortality of blacks – are important social forces shaping the composition of the US electorate.

Beyond any compositional impact, a contraction in black voting- age adults might also affect partisan politics and policy, and thereby influence structural inequality. Abundant evidence indicates that race and racial prejudice affect political attitudes (Henry & Reyna, 2007; Sears & Kinder, 1971), candidate preferences (Bobo & Dawson, 2009; Valentino & Sears, 2005), political behavior (Enos, 2011; Sidanius & Pratto, 2001), political ideology (Lane et al., 2011; Pratto et al., 1994), public opinion (Mendelberg, 2008; Valentino et al., 2002), political inclusion (Lavariega Monforti & Sanchez, 2010; Massey & Denton, 1989), and race-based policy preferences (Rabinowitz et al., 2009; Tesler & Sears, 2010). Other evidence ties these racialized political processes to broad social inequalities (Bonilla-Silva, 2013) including race-based geographic or residential segregation (Dawson, 1995), incarceration rates (Caplow & Simon, 1999), and access to and the quality of structural resources such as medical care and welfare

(Gilens, 1995) – all factors connected to health outcomes. In the US, where populations with different voting preferences face systematically unequal life chances, population health inequalities could affect not only the composition of the electorate, but election outcomes and subsequent policy, including policy that influences the health disparities that lead to excess mortality (Rodriguez et al., 2013)).

In this analysis, we estimate the impact of excess deaths among blacks on the racial composition of the electorate in the US presidential election of 2004. Because felony disenfranchisement is widely considered significant enough to have changed electoral outcomes, especially in local elections (Manza & Uggen, 2006; Uggen & Manza, 2002), we also explore the impact of black excess mortality on statewide elections.

Theoretical Framework

The social, economic and geographical inequalities in mortality found in the US are remarkably large by international standards (Marmot & Bell, 2009) and disproportionately disadvantage blacks relative to whites. Much evidence suggests that US black-white health disparities are persistent at all levels of the socioeconomic spectrum (Pearson 2008), and far higher than in other affluent countries with less of a history of racial discrimination. There are few other comparable affluent countries and often the nature of racial discrimination there has been very different, such as with aboriginal populations in Australia. Health status is the major driving force behind mortality schedules in the US. In 2004, about 93% of all US mortality was attributable to morbidity, with the remaining 7% attributable to factors such as accidents (4.9%), suicide (1.4%), and assault (0.7%). In particular, a major portion of the mortality gap between blacks and whites can be attributed to the unequal distribution of chronic morbidity among

young through middle aged adults (Geronimus et al., 1999; Geronimus et al., 1996; Geronimus et al. 2011).

Figure 1 shows the age distributions of all individuals who died in the US in 2004 by race. The area between the curves represents the mortality gap between non-Hispanic blacks and whites. Notably, the distributions do not intersect until approximately age 73, indicating that the mortality gap between blacks and whites persists throughout the normal average life expectancy of blacks. Figure 1 also shows that the mortality gap between blacks and whites is greatest between the ages of about 40 and 65 – also an age range during which the probability of turning out to vote is the highest, as shown in Figure 2. Simply put, this creates an especially high political participation disadvantage for the black population because blacks are dying off from the electorate at higher rates than whites during the years of highest voter turnout. If turnout among black voters were disproportionately higher at old ages then the effects shown here would be even greater.

[Figures 1 and 2 about here]

The causes of racial health disparities are multiple and complex and include social policies and laws that are, at least theoretically, amenable to reinforcement or change depending on political mandates. Among them, residential segregation and cumulative disinvestment in predominantly black neighborhoods in the US have contributed significantly to health disparities (Geronimus 2000). Predominantly black neighborhoods are characterized by higher exposure to pollution, fewer recreational facilities, less pedestrian-friendly streets/sidewalks, higher costs for healthy food, and a higher marketing effort per capita by the tobacco and alcohol industries (Diez Roux & Mair, 2010; Diez Roux et al., 2001; Geronimus, 2000). In the US, high black-white

disparities are also detected in access to and quality of health care resources, including health insurance coverage and health services for preventive screening, diagnosing and treatment, and rehabilitation (Williams & Mohammed, 2009).

Moreover, racialization and its subsequent environmental, material, and health care constraints shape exposure to everyday challenges and coping options. Repeated and high-effort coping with social disadvantage and the contingencies of stereotyped social identity are now thought to contribute to a cumulative physiological toll across the life-course, or *weathering* Geronimus et al 2006). Weathering reflects stress-mediated physiological damage and dysregulation across body systems. These can result in a relatively steeper age-gradient increase in high allostatic load, adverse health outcomes, and excess death from young through middle adulthood, such as that observed in Figure 1 (Crimmins et al., 2003; Geronimus et al., 2010; McEwen & Seeman, 1999).

To the extent that social stratification processes – which are affected by public policy and political power – sort Americans into different socioeconomic strata and physical environments based on their race, a disproportionate number of blacks are non-randomly exposed to the stressors that emanate from social disadvantages, thus contributing to racial inequality in health. It is widely acknowledged that eliminating racial disparities in health will require addressing fundamental social causes and more proximate social determinants of health. Because the social determinants of health are influenced by political forces, black voter turnout (and survival to be able to turnout in particular) may play a key role in determining both the mechanisms of social stratification and the ultimate exposure of blacks to the psychosocial and environmental stressors that increase racial health disparities (Rodriguez et al., 2013, 2014).

In sum, large and persistent US black-white mortality disparities could be both a cause and an effect of political processes. Social and health policies that have population health implications are shaped, in part, by those holding elective office, and political participation mediates this association by shaping the partisanship of elected officials (Keiser et al., 2004; Schneider & Ingram, 1993; Blakely et al. (2001) (Purtle, 2013) (LaVeist, 1992)) Add reference to Thompson JP. *Double Trouble*). Because political representation is a function of the share of the population eligible to vote and participation levels throughout adulthood, racial disparities in age-specific mortality rates may influence political outcomes. In particular, as excess mortality impacts black underrepresentation in the electoral process, it may limit blacks' influence on policy-making and political decision-making processes that affect their health. It is also possible to argue that political parties not strongly supported by black voters might have redoubled their efforts to turn-out white voters, or have moved their policies to be less racially biased had there been more black voters if mortality rates among blacks had been lower. What matters is the magnitude of the hypothesized effect, the number of potential voters not able to vote due to premature mortality.

Racial Mortality Gaps and Electoral Politics

The effects of black-white differential mortality on electoral participation are dynamic and influence the demography of politics in at least three meaningful ways. First, individuals who die before the age of 18 never have the opportunity to vote. Second, individuals who die after the age of 18, but before the age of life expectancy of their cohort have a shorter "electoral life" than those who culminate their normal life span. And third, premature death prevents individuals from voting not only in the election immediately following their death but in all

subsequent elections for which they could have expected to have lived, making the effect cumulative. This cumulative effect of premature mortality on nonparticipation most dilutes the political voice of blacks and puts them at a representative disadvantage relative to whites.

Research Design

The aim of this study is to estimate the effect of observed black-white mortality differentials on the racial composition of the electorate. In particular, we evaluate a counterfactual: What would have been the effect on the 2004 general election if blacks had survived at the same rates as whites between the years 1970 and 2004? Considering that differential mortality effects are cumulative, the case study of the 2004 general election allows for the full electoral cumulative effects of excess mortality in the time range of the available data. Because the mortality files we use are only available on the state level until 2007, the 2004 general election represents the latest general election available for analysis.

Ideally we would trace cohort mortality back to birth, but for methodological and data availability reasons, we instead start the clock at 1970 rather than at the birth cohort of the oldest blacks alive in 2004. Although crude versions of the mortality data used in this analysis date back to 1959, it is not until 1970 that the available data allow us to account for consistent state-level mortality statistics in all states and years, and to validly identify the Hispanic or non-Hispanic origin of whites and blacks. In addition, in our statewide calculations we assume no net migration across states. This assumption is implausible prior to 1970, when blacks moved in great numbers from southern to northern states during the Great Migration, but reasonable after 1970 given the small cross-state net migration rates among blacks in recent decades. Using 1970 as the starting point, however, implies that we will underestimate accumulated excess black

deaths by 2004 given that all those succumbing to premature death before 1970 – who would have otherwise survived beyond 1970 – are excluded from the analysis.

Our calculations use data from four sources. Deaths by state of residence, race, gender, and age were derived from the Multiple Cause of Death files from 1970 to 2004. Population counts by state of residence, race, gender, and age were taken from population estimates from the US Census Bureau. Data on the total number of votes by state were taken from the US Elections Project, while data on the gender, race, and age distribution of voters were taken from the National Election Pool General Election Exit Polls (2004). For more details, see the Data Appendix.

All calculations are conducted using stratification by sex, non-Hispanic race origin (i.e., non-Hispanic black and non-Hispanic white), age (0 to 84 years), state of residence (32 states with significant black populations and the District of Columbia), and year (1970 to 2004). To exploit the fullness of the available data, we use similar analyses to examine both the presidential election of 2004 and key senate and gubernatorial elections during the study period.

For detailed descriptions of our estimation procedures, please see the Methodological Appendix. Our calculations can be thought to occur in stages. First, the total number of black excess deaths by sex, age, and state is calculated for each year between 1970 and 2004. Then, applying life tables for whites, we calculate the fraction of black excess deceased who would have survived to 2004 had they faced white mortality rates. Finally, using the election data we then estimate the fraction of these hypothetical black survivors who (1) would have voted and (2) would have voted for each party's nominee (John Kerry or George W. Bush), assuming that the voting behavior of these hypothetical survivors would have resembled the voting behavior of the existing black population stratified by sex, age, and state of residence. To provide a context for

the magnitude of our findings, we compare the number of voting-age hypothetical black survivors in 2004 to the total number of black disenfranchised felons and ex-felons in that year.

In addition, we examine the hypothetical partisan-electoral effect of black votes lost to excess mortality at the state level by identifying close senate and gubernatorial elections between 1978 and 1994. In this calculation, we assume that the number of voting-age excess deceased blacks who would have survived would be the same as in 2004. Given the stability of the black-white mortality gap, this assumption, while crude, should not be badly biased. In addition, as explained above, we underestimate the 2004 accumulated excess black deaths by excluding from analysis those excess deaths occurring before 1970.

We looked for senate and gubernatorial elections in which the margin of victory for the Republican compared to the Democratic candidate was 35% or less than the number of hypothetical black survivors in that state, positing that these races were sufficiently close that had blacks survived at white rates, it is reasonably likely that the election result would have been reversed. We then compared these results to the implications for state elections of felony disenfranchisement calculated by Uggen and Manza (Uggen and Manza, 2002 and Manza and Uggen, 2006).

Results

As shown in Table 1, we calculate 2.7 million excess deaths among US blacks (age 0-84 years) from 1970 to 2004 in the 32 study states plus the District of Columbia (for additional estimations see appendix Table A2). Considering that the total US black population was 22.6 million in 1970 and 36.1 million in 2004, this number represents 20% of the total national black population growth in this period.

The total number of black deaths would have been reduced from 8.5 million to 5.8

million if blacks faced the same mortality schedules as whites. Thus, 1 out of every 3 black deaths occurring within this time period was an excess death.

[Table 1 about here]

Of the 2.7 million black excess deaths, we project a total for hypothetical survivors to 2004 of 1.87 million, about 1 million of whom would have been voters (Table 1). This number represents 7.9% of the national black vote in the election. Because black Americans vote overwhelmingly Democratic and do not tend to split their tickets, black excess mortality disproportionally diminishes the Democratic Party voting base. Of course, had the US had a different history and social and economic inequalities between black and white Americans been less pronounced then black Americans might not have voted so solidly for one party; but the US only has one history that we can try to determine the effect of.

According to our calculations, Democratic presidential candidate John Kerry lost 86.6% of the total number of all black votes lost to black excess mortality – or about 900,000 votes – while Republican candidate George W. Bush lost about 13.4%, or 140,000, of these votes.

Turning to state level results, we estimate that between 1978 and 2004 the outcomes of 7 senate and 11 gubernatorial elections would have been reversed from Republican to Democratic victors with the addition of black hypothetical survivors alone (see Tables 2 and 3). Uggen and Manza's estimations of the impact of felony disenfranchisement on senate elections (Uggen and Manza, 2002 and Manza and Uggen, 2006) found it reversed a total of 7 senate races between 1978 and 2004, of which 4 overlap with 7 we have identified. In on election, the 2002 senate election in Missouri, if you add to get the mortality and felon effects one infers that the Democrat might have won, even though neither effect alone would have been sufficient to change the election.

[Tables 2 and 3 about here]

Discussion

In this study, we provide the first estimates of the impact of racial mortality differentials on political participation in the US by analyzing the impact of black excess deaths from 1970 to 2004 on the racial composition of the electorate and election outcomes for the 2004 presidential election, and for close state elections during the study period. We find that premature deaths among blacks have had a significant impact on the racial composition of America's electorate and, during the study period, a key influence on major state and national elections.

In our calculations we were able to account for only 35 years of mortality exposure rather than the ideal of 84 years. Manza and Uggen (2006) estimated the total number of black voting-age disenfranchised felons and ex-felons at 1.95 million for the year 2004 alone, which is close to our estimate of the 1.74 million total black voting-age hypothetical survivors in 2004, even with our truncated years of data (see Table 1). And Manza and Uggen's estimated figure is widely considered significant enough to have changed electoral outcomes, especially in local elections (Manza & Uggen, 2006; Uggen & Manza, 2002).

At the state level, we estimated that black excess mortality had even larger political consequences than felony disenfranchisement, despite the US having by far the highest proportion of its population imprisoned of any country in the world and such a high proportion of the imprisoned population not being white. Manza and Uggen (2006) estimated that the totality of disenfranchised felons and ex-felons could have reversed 7 senate and 3 gubernatorial elections in favor of the Democratic candidate between 1974 and 2000. If blacks had enjoyed the

same mortality schedules as whites during the study period, we estimated that the outcomes of 7 senate and 11 gubernatorial elections would have been reversed from Republican to Democratic.

This possible effect has substantial political potency given that the reversal of the specific senate elections would have changed the controlling party in the Senate from 1986 to 2002 (Purtle 2013, Uggen and Manza, 2006) and might have made it filibuster-proof during recent periods of Democratic control.

When we combined the effects on the black voting population of both excess mortality *and* felony disenfranchisement, we found that 1 in 7 (14.8%) of all voting-age blacks did not have the opportunity to vote in 2004 for one of these two reasons (Table A2, Appendix). In 2004, a total of 166 presidential electoral votes (61.5% of the 270 needed to elect a president) were disputed in states where at least 15% of voting-age blacks did not have the opportunity to vote either due to premature death or felony disenfranchisement.

Blacks having the same mortality schedules as whites during the study period could have yielded different results in other political arenas as well – state legislatures, cities, counties, and congressional districts, although data limitations precluded us from these calculations. They also may have acted to reduce the gerrymandering and redistricting by the majority that dilutes the political power of racial minorities. The impact of these hypothetical black survivors might have been felt in other aspects of the democratic process, such as Democratic primaries, in which blacks manifest a high vote share in key Southern states (some over 40%), or in the electoral college presidential vote, especially when a small number of swing states decide the election. For example, if only 1% of the estimated 99,705 voting-age black hypothetical survivors in Florida during the 2000 presidential election had voted and in the expected Democratic versus Republican proportions, Al Gore would have defeated George W. Bush.

Looking at a state-level race, our estimates imply that the 2010 gubernatorial election in Florida would have been reversed, and the Democrat elected, had the disenfranchised felons and excess black deceased had the opportunity to vote. In this case, given that Florida did not subsequently incorporate the Medicaid expansions provided by the Affordable Care Act – a common practice in states with Republican governors – a different electoral outcome might have affected the health prospects of millions of Floridians through this health resource alone.

Our examination suggests that large and persistent black-white mortality disparities have been both a cause and a consequence of partisan US politics over the past 40 years. There a a huge number of 'what might have been' hypotheses that can be generated from this. For example, had the power of black voters in the US been greater had black lives mattered more in the past then would the US have moved to more normal European systems of health care much earlier, systems that most immediately appear to favour the worse off but in effect result in a general improvement in overall health at much lower cost. Would the money the US would have saved by having had cheaper and more efficient health care and longer life expectancies overall (as almost every European country has) been used to improve it education system and then results in better economic fortunes than the US has enjoyed? Apart from the implications of our results for the black electorate in terms of political empowerment and representation, what difference might it make for American democracy in general, if we were able to diminish or eliminate the several sources of disproportionate black disenfranchisement? In a recent study, Fowler (2013) investigated the implementation of compulsory voting in Australia − a democracy with past turnout inequalities between different social groups similar to present-day inequalities in the US. The investigation was undertaken to respond to the question of what would happen to

public policy and the partisan composition of government if the electorate were substantially expanded. Findings from this research suggest that both policy and government became more representative of the aggregate interests of the citizenry, including the most disadvantaged who did not vote before the adoption of compulsory voting. This one piece of evidence suggests that expanding the US black franchise could be salutary toward the passage and implementation of health policies that have an equity component, although perhaps compulsory voting might also be required to partly further address past inequities (Geronimus & Thompson, 2004; LaVeist, 1992; Purtle, 2013).

The findings of this paper suggest that excess black mortality has contributed to imbalances in political power and representation – especially between blacks and whites, at it is blacks for whom these disparities are most pronounced although whites can also loose out from living in a more unequal society. The findings are important in light of the connections among politics, policy, and participation. Politics helps determine policy, which subsequently affects the distribution of public goods and services, including those that shape the social determinants of health, which influence disenfranchisement via excess mortality. In the United States, especially after the political realignment of the 1960s, policy prescriptions emanating from government structures and representing ideologically divergent constituencies have influenced the social determinants of health, including those that affect socioeconomic and racial disparities. And given the critical role of elected politicians in the policy-making apparatus, the available voter pool is an essential mechanism for the distribution of interests that will ultimately be represented in the policies and programs that affect the health of all.

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Figures and Tables

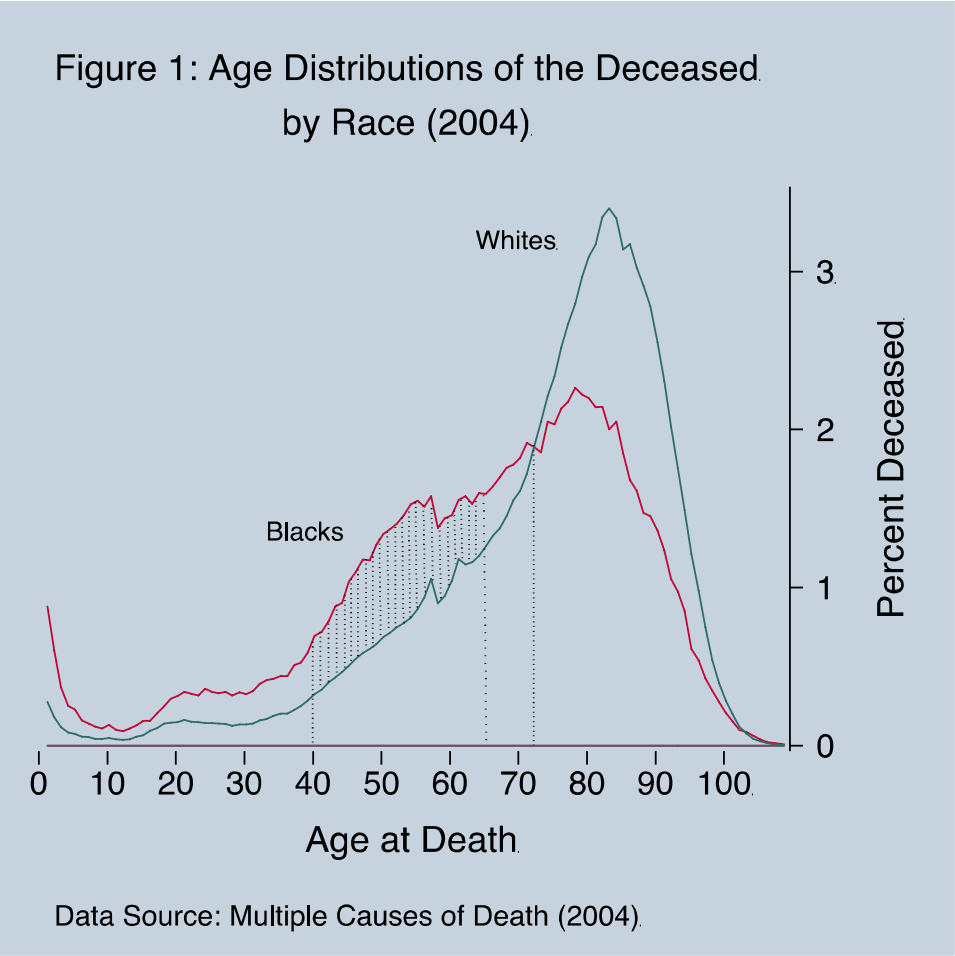
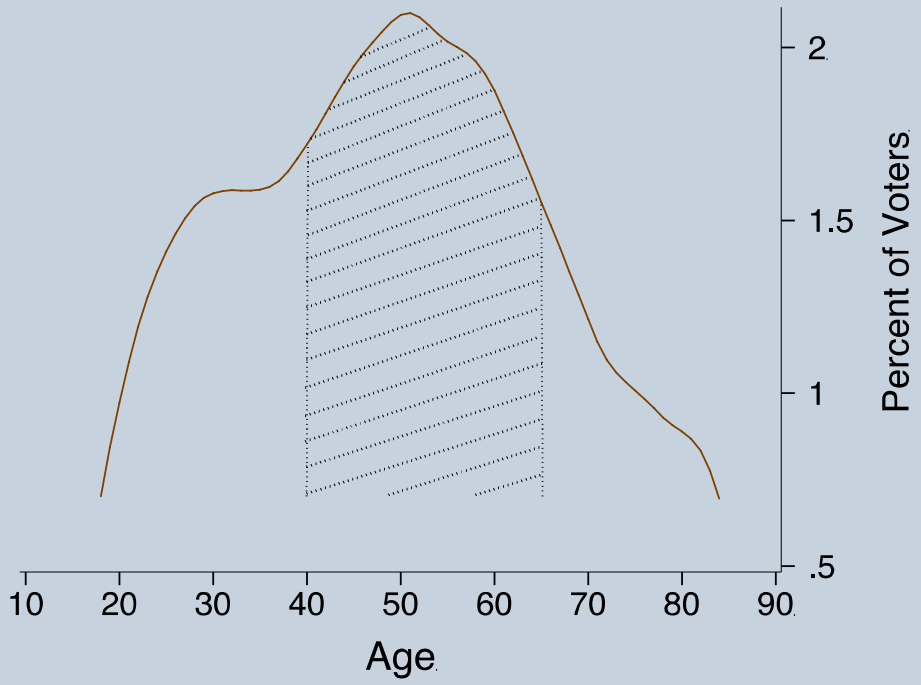


Figure 2: Age Distribution of Voting Population (2004)
(Ages 18 to 84 years)



Data Source: National Election Pool General Election Exit Polls (2004)

Table 1. Estimates of excess deceased blacks (1970-2004), hypothetical survivors and votes lost (2004)

State	Total Black Excess Deceased (1970-2004)	Hypothetical Black Survivors to 2004	Voting-age Hypothetical Black Survivors to 2004	Voting-age Hypothetical Survivors as Percent of Black VAP	Total Black Votes Lost	Black Votes Lost for Kerry	Votes Lost for Kerry as Percent of Total Votes Lost	Black Votes Lost for Bush	Votes Lost for Bush as Percent of Total Votes Lost	Votes Lost as Percent of Total Black Votes
New York	256,004	193,672	183,654	8.7	88,657	77,238	87.1	11,419	12.9	9.5
Illinois	191,485	140,224	130,406	10.0	55,945	50,459	90.2	5,486	9.8	10.3
Florida	170,230	107,659	99,705	5.6	54,110	44,364	82.0	9,746	18.0	6.2
California	162,482	120,635	112,673	6.8	59,268	48,841	82.4	10,427	17.6	8.2
Texas	158,970	106,493	100,065	5.6	65,143	56,386	86.6	8,757	13.4	7.3
Georgia	154,380	102,343	95,052	5.3	47,286	39,728	84.0	7,558	16.0	5.8
North Carolina	142,957	92,549	86,960	6.7	59,292	49,271	83.1	10,021	16.9	6.8
Pennsylvania	132,674	90,276	84,579	9.6	71,932	62,099	86.3	9,833	13.7	9.8
Michigan	128,294	97,609	90,554	9.1	59,691	54,239	90.9	5,452	9.1	9.8
Louisiana	112,055	76,624	71,700	7.2	42,037	37,016	88.1	5,021	11.9	8.1
Virginia	107,365	67,084	62,771	6.0	56,231	50,205	89.3	6,026	10.7	8.3
New Jersey	103,858	80,155	75,049	9.1	54,188	44,925	82.9	9,263	17.1	10.5
South Carolina	101,121	65,970	62,175	7.3	35,223	29,599	84.0	5,624	16.0	7.5
Ohio	100,113	68,586	63,685	6.8	37,365	30,659	82.1	6,706	17.9	6.9
Maryland	99,806	73,179	68,118	6.0	41,133	36,539	88.8	4,594	11.2	7.4
Alabama	90,602	58,313	54,778	6.7	34,753	31,380	90.3	3,373	9.7	7.5
Tennessee	75,011	45,494	41,774	6.2	26,181	22,899	87.5	3,282	12.5	8.1
D.C.	70,120	48,012	46,425	18.5	21,501	20,735	96.4	766	3.6	17.6
Mississippi	68,700	49,031	45,604	6.4	29,990	27,378	91.3	2,612	8.7	7.8
Missouri	57,089	37,961	35,331	7.8	18,933	17,205	90.9	1,728	9.1	9.0
Indiana	38,192	26,732	24,663	6.7	13,997	12,696	90.7	1,301	9.3	8.2
Arkansas	32,396	20,396	19,254	6.7	11,389	9,551	83.9	1,838	16.1	7.2
Kentucky	22,080	11,622	10,974	5.0	9,565	8,370	87.5	1,195	12.5	6.4
Connecticut	20,125	16,068	14,902	6.5	6,089	5,438	89.3	651	10.7	6.7
Massachusetts	16,981	13,999	12,889	4.7	7,304	6,949	95.1	355	4.9	6.3
Wisconsin	16,511	13,433	11,751	5.6	8,915	7,499	84.1	1,416	15.9	6.1
Oklahoma	14,568	9,473	8,756	4.6	6,853	5,003	73.0	1,850	27.0	5.5
Delaware	10,460	6,984	6,437	5.6	5,054	4,382	86.7	672	13.3	6.8
Washington	8,274	6,204	5,602	3.5	2,705	2,073	76.6	632	23.4	4.8
Arizona	7,159	5,024	4,440	3.3	2,671	2,085	78.1	586	21.9	5.5
Colorado	7,139	5,518	4,852	3.7	4,759	3,770	79.2	989	20.8	6.4
Minnesota	5,877	5,116	4,353	3.1	3,694	3,176	86.0	518	14.0	4.2
Nevada	3,973	3,490	3,038	2.6	1,852	1,606	86.7	246	13.3	3.2
Total	**2,687,051**	**1,865,928**	**1,742,969**	**7.0**	**1,043,706**	**903,763**	**86.6**	**139,943**	**13.4**	**7.9**

Table 2. Crude test of hypothetical effect of mortality gaps on US senate elections

Territory - year	Republican candidate votes (two-party vote share %)	Democratic candidate votes (two-party vote share %)	Two-party vote difference (%)	35-year voting-age hypothetical black survivors (% black VAP)
Georgia - 1992	635,118	618,774	16,344	95,052
	50.7	49.3	1.3	5.3
Florida - 1988	2,051,071	2,016,553	34,518	99,705
	50.4	49.6	0.8	5.6
Georgia - 1980	803,686	776,143	27,543	95,052
	50.9	49.1	1.7	5.3
North Carolina - 1980	898,064	887,653	10,411	86,960
	50.3	49.7	0.6	6.7
Texas - 1978	1,151,376	1,139,149	12,227	100,065
	50.3	49.7	0.5	5.6
Virginia - 1978	613,232	608,511	4,721	62,771
	50.2	49.8	0.4	6.0
Nevada - 1974	79,605	78,981	624	3,038
	50.2	49.8	0.4	2.6

Table 3. Crude test of hypothetical effect of mortality gaps on US gubernatorial elections

State - year	Republican Candidate votes (two-party vote share %)	Democratic Candidate votes (two-party vote share %)	Two-party Vote difference (%)	35-year Voting-age hypothetical black survivors (% black VAP)
Alabama - 2002	672,225	669,105	3,120	54,778
	50.1	49.9	0.2	6.7
New Jersey - 1997	1,133,394	1,107,968	25,426	75,049
	50.6	49.4	1.1	9.1
Alabama - 1994	604,926	594,169	10,757	54,778
	50.4	49.6	0.9	6.7
New Jersey - 1993	1,236,192	1,210,130	26,062	75,049
	50.5	49.5	1.1	9.1
Mississippi - 1991	361,296	349,775	11,521	45,604
	50.8	49.2	1.6	6.4
Michigan - 1990	1,276,134	1,258,539	17,595	90,554
	50.3	49.7	0.7	9.1
New Jersey - 1981	1,145,999	1,144,202	1,797	75,049
	50.0	50.0	0.1	9.1
Louisiana - 1979	690,691	681,134	9,557	71,700
	50.3	49.7	0.7	7.2
Texas - 1978	1,183,828	1,166,919	16,909	100,065
	50.4	49.6	0.7	5.6
Ohio - 1974	1,532,214	1,520,554	11,660	63,685
	50.2	49.8	0.4	6.8
South Carolina - 1974	266,338	248,861	17,477	62,175
	51.7	48.3	3.4	7.3

Data Appendix

Study observations are derived from four datasets. The detailed mortality data are available from the Multiple Cause of Death (MCD) files from 1970 to 2004, which records virtually all deaths in the US as collected from individual death certificates. About 73 million individuals died between 1970 and 2004, and this is the number of cases analyzed in this study. Although crude versions of the mortality data used in this analysis date back to 1959, it is not until 1970 that the data allow us to account for consistent state level mortality statistics in all states and years, or to validly identify the non-Hispanic origin of whites and blacks in the data. All data are available by sex, non-Hispanic race origin (i.e., non-Hispanic black and non-Hispanic white), single-age year (0 to 84 years), state of residence (we include the 32 states with significant black populations and the District of Columbia), and year (1970 to 2004).

The population data are from the population estimates from the US Census Bureau. The data are available by sex, non-Hispanic race origin (i.e., non-Hispanic black and non-Hispanic white), age group (between ages 0 to 84 years), state of residence (we include the 32 states with significant black populations and the District of Columbia), and year (1970 to 2004). One complexity of population data is that estimations by the Census Bureau are not reported by single-age years (such as the MCD data) but by age groups in the majority of the time series. Accordingly, age data was interpolated to single-age years at all levels of the data (i.e., for all sex, non-Hispanic race origin, state of residence, and year combinations) using piecewise cubic hermite interpolating polynomials, a commonly used technique in population research (Jennings & Ordónez, 2011; Kostaki & Panousis, 2001; Moler, 2010; Tremblay et al., 2006). In this manner, the MCD data and the population data was matched at all levels of the data, including single-age years.

The counted vote data are from the US Elections Project, an institution specialized in reporting turnout statistics. These data are available by state.

The voter turnout data are from the National Election Pool General Election Exit Polls (2004). Their voter turnout data is comprised of representative samples of polling sites in all 50 states and the District of Columbia. The interviews were conducted with voters as they left their polling places on election day. The total weighted sample size is 76,027 interviews, of which 8,442 were with black voters. The data are available by sex, non-Hispanic race origin (i.e., non-Hispanic black and non-Hispanic white), single-age year (0 to 84 years), and state of residence (the 32 states with significant black populations and the District of Columbia) for the year 2004. To increase the reliability of our estimates, the data were aggregated into age-groups (1=18-29, 2=30-44, 3=45-64, and 4=65-84 years). In our calculation procedures, these age groups were subsequently matched to single-age year data in the MCD and US Census population sets of data (see Methodological Appendix).

Methodological Appendix

We carry out five calculations: (1) The total number of excess deaths among black people due to racial mortality gaps between 1970 and 2004, (2) the probability that the excess deceased would have turned out to vote in the presidential election of 2004 had they survived, (3) the total number of hypothetical black survivors should they had the mortality rates of whites, (4) the total number of black votes lost to racial mortality gaps in the presidential election of 2004, and (5) the total black votes lost in the general election of 2004 by candidates John Kerry and George W. Bush. To give context to our findings we also ran crude tests for the hypothetical partisan-electoral effect of votes lost to racial mortality gaps on a set of close senate and gubernatorial elections across the time period studied.

(1) Excess black deaths

The term "excess deaths" refers to the number of deaths resulting from differences in mortality rates between blacks and whites – that is, from mortality gaps. To create the counterfactual scenario, the mortality rate of whites is directly applied to blacks, such that the racial mortality gap is then multiplied by the black population. The resulting number represents the number of black individuals who should not have died if they had the mortality rates of whites. The *Total Black Excess Deaths (TED^B)* can be formally represented as follows:

$$TED^{B}_{1970-2004} = \sum_{Y=1970}^{2004} \sum_{Z=1}^{33} \sum_{S=1}^{2} \sum_{I=0}^{84} Pop^{B}_{i,s,z,y} \underbrace{\left(q^{B}_{i,s,z,y} - q^{W}_{i,s,z,y}\right)}_{Mortality-Gap} \qquad \text{(A1)}$$

where Y is the year of death (1970-2004); Z is the state of residence at death (1-33); S is the sex/gender group (1 = Male, 2 = Female); I is the individual's age at death (0 to 84 years); Pop^B is the black population; q^B is the mortality rate of blacks; and q^W is the mortality rate of whites. Racial mortality rates are calculated by dividing the total number of deaths over the respective

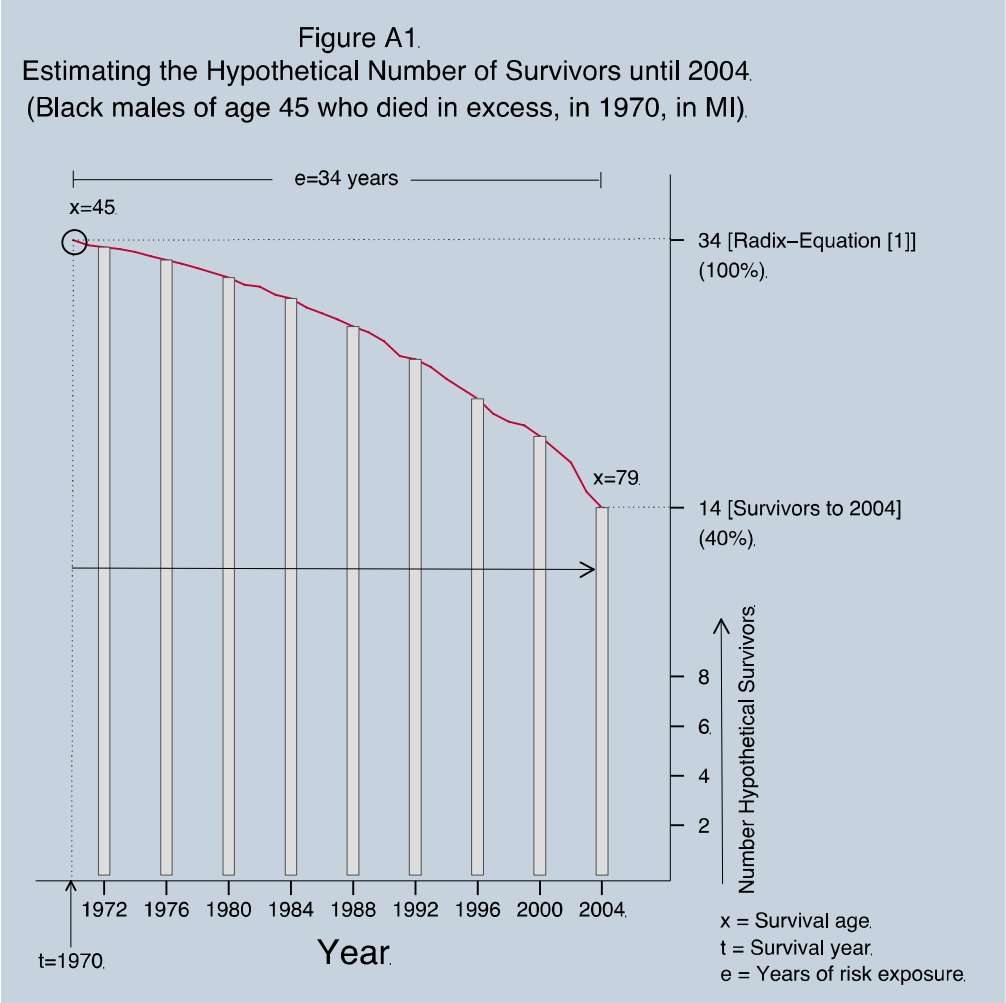
population for each and all levels of *I*, *S*, *Z*, and *Y*. The product of the black population and the mortality gap equals the number of excess black deaths. Thus, in essence, Equation A1 sums the excess number of black deaths for each age, for both males and females, across all 32 states plus the District of Columbia, from 1970 to 2004.

(2) Number of hypothetical survivors until 2004

In turning to estimate how black excess deaths continue to affect the composition of the electorate through time, we use a calculation based on survival projections based on the manipulation of the formal calculations used to construct life tables. The dynamics of interest pertaining to the present calculation rest on projecting the dying cohorts onto hypothetical surviving populations in the future. Population projections are particularly useful for assessing counterfactuals, and they have been implemented extensively to calculate hypothetical scenarios in which mortality rates constitute the basis of the counterfactual condition (Preston et al., 2001; White & Preston, 1996).

Implicit in this exercise is the notion that, even if blacks had in the past experienced the much lower mortality rates of whites, some of them may have died from one year to the next due to the ordinary death risks in the human lifespan. If a black death is "avoided" in the year of dying, then this surviving individual should be exposed to the same mortality risks in subsequent years to which whites were exposed to, as predetermined by the counterfactual condition. Consequently, a peripheral dying black population should be discounted from the potential voters estimation.

As an example of one state, Figure A1 gives a picture of the survival curve of the 34, 45-year-old black males who died in excess in 1970 in the state of Michigan. This group of black men is assumed to have survived and then to have been exposed to the mortality risks of whites



that share their age, sex, and state across time. Accordingly, 14 of them (40% of the initial 34) would have survived until 2004, when they would have been 79 years old. Figure A1 also depicts how, as time progresses, the survival curve meets the bars (which represent the presidential elections between 1970 and 2004), signaling the number of black individuals that would have survived at each instance and would have had the opportunity to participate in each of the subsequent general elections.

Table A1 shows the mechanism behind the calculation of the total number of hypothetical survivors. Note that the “radix” (i.e., the starting number of surviving individuals in the table) equals the total excess deaths of 45-year-old black males in 1970 in Michigan

Table A1. Survival Projection Table
(Black males survivors in 2004 who were 45 years old and died in excess in 1970 in Michigan)

Survival Year	Survival Age	Mort. Rate (Whites)	Percent Surviving	Number Surviving
t	x	$q^{w}_{x,t}$	$\%\, l_{x,t}$	$l_{x,t}$
1970	45	0.005798	100.0	***34***
1971	46	0.006371	99.4	34
1972	47	0.006926	98.8	34
1973	48	0.007418	98.0	33
⋮	⋮	⋮	⋮	⋮
2001	76	0.054747	47.8	16
2002	77	0.058966	45.2	15
2003	78	0.062510	42.5	14
2004	79	0.062561	39.8	***14***

estimated using Equation A1 (in this case, 34 individuals). In mathematical terms, for this specific example:

$$Radix = l_{x,t,(e=0)} = TED^{B}_{i=45,s=1,z=17,y=1970}$$

where x is the survival age, t is the survival year, and e is the number of years of risk for death exposure. Note that, in this instance, x is equal to the age at death i, t is equal to the year of death y, and the years of risk for death exposure can be represented by the equation: $e = (2004 - t)$. Table A1 also illustrates how, as a fraction of the initial 34 black individuals survive into a future year t, their age x advances accordingly. For example, 33 individuals (98.0% out of the initial 34) would have survived until 1973, when they would have been 48 years old.

The estimation of the projected surviving population 1 year into the future can be expressed in this form:

$$l_{(x+1)(t+1)} = l_{x,t} - \left(l_{x,t} \bullet q^{W}_{x,t}\right)$$

where the term $q^{w}_{x,t}$ denotes the respective mortality rate of whites at age *x* in year *t*. Accordingly, the term $(l_{x,t} \bullet q^{w}_{x,t})$ represents the dying population at age *x* in year *t*, which is discounted from the preceding population $l_{x,t}$.

Taking these calculations into account, the total number of black hypothetical survivors that would have reached the year 2004 (out of the initial 34 in this particular case) can be expressed in the following terms:

$$l_{(x+e=79),(t+e=2004)} = r_{i=45,s=1,z=17,t=1970}$$

where *r* denotes the total number of black male survivors in 2004 from the cohort who died in excess. Correspondingly, the total number of hypothetical survivors in 2004 can be formalized as follows:

$$THS^{B}_{2004} = \sum_{Y=1970}^{2004} \sum_{Z=1}^{33} \sum_{S=1}^{2} \sum_{I=0}^{84} r_{i,s,z,y} \qquad \text{(A2)}$$

and,

$$r_{i,s,z,y} = \sum_{x} \sum_{t} \sum_{e} l_{(i,s,z,y),e,t,x} \qquad \text{(A3)}$$

where *l* represents the number of surviving individuals (i.e., total black excess deaths estimated using Equation A1) at each combination of *i*, *s*, *z*, and *y*, which are fixed in Equation A3; *x* is the survival age, *t* is the survival year, and *e* is the number of years of risk for death exposure, such that *r* represents the total number of hypothetical survivors until 2004 for each projected surviving population at all levels of *i*, *s*, *z*, and *y*. Accordingly, what Equation A2 represents is the summation of all hypothetical survivors in 2004 from those who died in excess between 1970 and 2004, in all 32 states plus District of Columbia, males and females, up to age 84.

(3) Probability of hypothetical survivors turning out to vote in the general election of 2004

Considering well-known inconveniences related to self-reported turnout (Burden, 2000; Holbrook & Krosnick, 2010; Vavreck, 2007) we take advantage of the size of our sets of data to estimate a rate of turnout. The probability that hypothetical black survivors would have turned out to vote in 2004 is calculated using the equation:

$$\Pr(V=1)^{B}_{z,s,g} = \left(\frac{V^{B}_{z,s,g}}{VEP^{B}_{z,s,g}}\right) = \left(\frac{E^{B}_{z,s,g} \bullet TCV_{z}}{VEP^{B}_{z,s,g}}\right) \qquad \text{(A4)}$$

where z is the state (1-33); s is sex/gender group (1 = Male, 2 = Female); g is the age group (1 = 18-29, 2 = 30-39, 3 = 40-49, and 4 = 50-84 years); V^{B} is the total number of votes cast by blacks; E^{B} is percent of people exiting from the polls that were black; TCV is the total counted vote; and VEP^{B} is the voting-eligible black population.

Among those who are not eligible to vote are ex-felons (depending on state law), non-citizens, the mentally impaired, and individuals who do not meet state residency requirements (McDonald, 2004). With respect to the black population, ineligibility due to felony disenfranchisement is well documented and highly significant. For example, in 2004 there were about 1.95 million disenfranchised black ex-felons in the 32 states analyzed here plus the District of Columbia (Manza & Uggen, 2006) among which about 1.4 million were black male ex-felons (McDonald, 2004). The term VEP^{B} therefore represents the black voting-age population adjusted for disenfranchised felons. Note that both terms E^{B} and TCV in Equation A4 inherently take into consideration eligibility (as we know they voted, so they should have been eligible). Because the term VEP^{B} does not account for non-citizens, the mentally impaired, and individuals who do not meet state residency requirements, the denominator in Equation A4 is slightly larger than it should be, and the probability of blacks turning out to vote is therefore underestimated.

Ideally, in Equation A4, we would have adjusted the number of state disenfranchised black felons at all levels of *s* and *g*; however, the data are not reported as such. Our state-level data was thus adjusted using the national proportions of black inmates in state, federal, and local jails by gender and age group in 2004 published by the Bureau of Justice Statistics (Harrison & Beck, 2005). We additionally experimented with other proportions especially at the state level; differences in our adjusted estimates showed to be trivial.

(4) Total black votes lost in the general election of 2004 to mortality gaps

The multiplication of Equation A2 by Equation A4 produces the number of black votes lost in the general election of 2004 due to mortality gaps between the races for a specific configuration of *I, Z, S,* and *Y*. Therefore, in Equation A5 we sum this product across all levels of *I, Z, S,* and *Y* to obtain the total number of black votes lost in 2004:

$$TVL^{B}_{2004} = \sum_{Y=1970}^{2004} \sum_{Z=1}^{33} \sum_{S=1}^{2} \sum_{I=0}^{84} \left(r_{y,z,s,i} \bullet \Pr(V=1)^{B}_{z,s,g(a)} \right) \qquad \text{(A5)}$$

where *g* represents the age group (1 = 18-29, 2 = 30-39, 3 = 40-49, and 4 = 50-84 years). Note that in Equation A5 $g(a) = f(i,y)$, and that $g(a)$ is the respective age group that matches age *a*. Accordingly, *a* can be estimated as $a = (2004 - y) + i, \ \forall a \geq 18$. However, this is a mere notation artifact – by implementing the probability of turning out to vote among blacks $\Pr(V=1)^{B}$ we are inherently excluding hypothetical survivors who did not reach the voting age of 18 by year 2004. Concisely, Equation A5 assigns to each hypothetical survivor the specific probability of turning out to vote in 2004 and sums across all levels of *I, Z, S,* and *Y*.

(5) Total black votes lost in the general election of 2004 by candidates John Kerry and George W. Bush

The estimation of the probability that hypothetical survivors would have voted, for example, for Democratic candidate John Kerry in 2004 is analogous to Equation A4:

$$\Pr(V_{Kerry}=1)^{B}_{z,s,g}=\left(\frac{V^{B_{Kerry}}_{z,s,g}}{VEP^{B}_{z,s,g}}\right)=\left(\frac{E^{B_{Kerry}}_{z,s,g}\bullet TCV_{z}}{VEP^{B}_{z,s,g}}\right) \qquad \text{(A6)}$$

where z is the state (1-33); s is sex/gender group (1 = Male, 2 = Female); g is the age group (1 = 18-29, 2 = 30-39, 3 = 40-49, and 4 = 50-84 years); $V^{B_{Kerry}}$ is the total number of votes cast by blacks in favor of Kerry; $E^{B_{Kerry}}$ is percent of people exiting from the polls that were black and voted for Kerry; TCV is the total counted vote; and VEP^{B} is the voting-eligible black population.

The multiplication of Equation A5 times Equation A6 produces the number of black votes lost by John Kerry in 2004 for a specific configuration of *I*, *Z*, *S*, and *Y*. Therefore, in the following equation we sum this product across all levels of *I*, *Z*, *S*, and *Y*:

$$TVL^{B_{Kerry}}_{2004}=\sum_{Y=1970}^{2004}\sum_{Z=1}^{33}\sum_{S=1}^{2}\sum_{I=0}^{84}\left(r_{y,z,s,i}\bullet\Pr(V=1)^{B}_{z,s,g(a)}\bullet\Pr(V_{Kerry}=1)^{B}_{z,s,g(a)}\right) \qquad \text{(A7)}$$

where the specifications are the same of those for Equation A5. Given that the total black vote for Kerry and Bush comprised over 99.3% of the total black vote in the 2004 general election, the number of black votes lost for Bush would closely approximate the difference between total black votes lost and black votes lost for Kerry.

(6) Subnational electoral analyses

For our subnational level analyses we identified a set of close senate and gubernatorial elections between 1970 and 2004 (see text). Analyzing elections before 2004 implies using fewer years of accumulated deaths; however, there was rough stability through time such that we were able to use our 2004 estimates to crudely approximate patterns for earlier years. Explicitly, this

exercise assumed that in election states the fraction of black population, number of excess black deaths, and black voter turnout and Democratic-partisan preference were reasonably stable such that the 35-year cumulative number of voting-age hypothetical black survivors and the possible votes they represent in any given year did not vary very much. The data showed these assumptions were not far from reality; for example, in 1970 the average number of state excess black deaths was about 2,220 (SD≈1,850) whereas in 2004 was about 2,370 (SD≈1,810). By 1968 black voter turnout and Democratic-partisan preference was already very similar to actual levels, with voter turnout at 56.7% of total black population (vs. 60.8% in 2004) and Democratic candidate Hubert Humphrey receiving about 97% of the black vote (vs. 87% for Kerry in 2004). The state fraction of black population also showed to be stable; for purposes of illustration, between 1974 and 2010 state fraction of black population showed averages of 0.12 (SD≈0.002), 0.14 (SD≈0.011), 0.16 (SD≈0.018), and 0.26 (SD≈0.005) in key states such as Texas, New Jersey, New York, and Alabama respectively without radical variations in other states.

Additional Tables

Table A2. Additional estimates

State	Black Voting Age Population (VAP)	Black Voting Eligible Population (VEP)*	Hypothetical Survival Rate	Total Black Votes	Combined total possible black voters as percent of black VAP (2004)**	Total Disenfranchised Felons (2000)^	Total Disenfrachised Felons (2004)^^
New York	2,112,538	2,033,846	75.7	936,274	12.4	131,273	122,018
Illinois	1,298,775	1,265,722	73.2	545,018	12.6	46,992	45,825
Florida	1,774,048	1,480,503	63.2	879,806	22.2	827,207	1,179,687
California	1,666,872	1,552,567	74.2	726,475	13.6	288,362	283,124
Texas	1,780,326	1,614,341	67.0	889,235	14.9	525,967	522,887
Georgia	1,795,283	1,634,378	66.3	819,155	14.3	286,277	283,607
North Carolina	1,298,151	1,255,924	64.7	873,826	10.0	70,653	73,113
Pennsylvania	884,960	858,859	68.0	737,587	12.5	36,847	41,626
Michigan	993,527	965,460	76.1	606,859	11.9	49,318	49,788
Louisiana	993,650	925,800	68.4	517,454	14.0	37,684	98,190
Virginia	1,052,911	844,568	62.5	676,667	25.7	310,661	377,847
New Jersey	824,795	754,546	77.2	515,572	17.6	143,106	127,178
South Carolina	853,482	822,642	65.2	470,873	10.9	52,210	48,523
Ohio	939,268	914,781	68.5	544,672	9.4	47,461	45,487
Maryland	1,140,673	1,076,270	73.3	555,384	11.6	139,565	111,521
Alabama	821,769	697,371	64.4	465,321	21.8	212,650	250,046
Tennessee	679,027	635,829	60.6	322,296	12.5	91,149	94,258
D.C.	251,108	250,411	68.5	122,325	18.8	7,599	730
Mississippi	707,051	614,819	71.4	383,374	19.5	119,943	146,155
Missouri	452,168	417,483	66.5	209,254	15.5	83,012	93,752
Indiana	370,521	359,150	70.0	171,734	9.7	21,458	26,245
Arkansas	289,414	263,928	63.0	157,192	15.5	50,416	57,691
Kentucky	220,937	171,644	52.6	148,487	27.3	147,434	186,348
Connecticut	228,838	214,534	79.8	90,963	12.8	45,184	22,854
Massachusetts	271,584	267,780	82.4	115,033	6.1	—	10,140
Wisconsin	210,638	186,345	81.4	146,412	17.1	54,025	62,342
Oklahoma	189,627	174,745	65.0	125,422	12.5	52,089	49,541
Delaware	115,905	95,043	66.8	74,374	23.6	30,006	46,677
Washington	159,694	136,330	75.0	56,723	18.1	158,965	167,316
Arizona	133,943	109,762	70.2	48,960	21.4	140,870	176,103
Colorado	131,970	124,511	77.3	74,865	9.3	23,300	28,636
Minnesota	138,548	129,683	87.0	87,700	9.5	41,477	38,784
Nevada	118,488	105,856	87.9	57,525	13.2	66,390	43,594
Total	**24,900,489**	**22,955,431**	**69.4**	**13,152,818**	**14.8**	**4,339,550**	**4,911,633**

* Voting eligible population (VEP) equals the voting-age population minus the total number of diesnfranchised black felons.

** This is the sum of total disenfranchised black felons and voting-age hypothetical black survivors as percent of black VAP, which represents the combined electoral effect of black excess mortality and black felon disenfranchisement.

^ Figures estimated by Uggen and Manza (2002) for year 2000.

^^ Data estimated by Manza and Uggen (2006) for year 2004.

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