eAppendix 1: Technical documentation for National Center for Health Statistics Compressed Mortality File, including intercensal population estimates

1. Compressed Mortality File 1968-88, CD-ROM Series 20, No. 1A, ASCII Version.
Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Health Statistics, pp 9-11

IV. Description of the Population File

There are national, state, and county population estimates on the population file of the CMF. The population estimates are based on U.S. Bureau of the Census estimates of U.S. national, state, and county resident populations. The 1968-69 national estimates and all of the estimates for 1971-79 and 1981-88 are intercensal estimates of July 1 resident populations. The 1970 and 1980 population estimates are April 1 modified (modified age-race-sex) census counts. The 1968 and 1969 state and county population estimates were calculated by NCHS using linear extrapolation. A brief description of the population estimates is provided here; a more detailed description is provided in Appendix D.

Specific details
1. There is one record on the file for each geographic unit (total U.S., state, county) x year x race-sex group.

2. Modifications of the population estimates made by NCHS:
a. To permit the calculation of infant mortality rates, NCHS live-birth data were substituted for the estimates of the population under one year of age. The race code for these records is derived from "race of mother".

b. When the age group 1-4 years did not appear on the Census file, the age group 0-4 years was multiplied by 0.8 to obtain an estimate of the population 1-4 years.

c. For non-censal years prior to 1992, the NCHS Division of Vital Statistics uses national population estimates rounded to the nearest 1,000 to calculate published death rates. On the CMF, the national population estimates for 1968-69 and 1971-79 are rounded to the nearest 1,000 in accordance with this practice.

However, this means that calculation of rates for aggregate age, race, and/or sex groups involves using population estimates that were rounded before aggregation rather than after aggregation. As a result, national death rates for aggregate groups calculated using the rounded estimates on the CMF may differ slightly from those published by NCHS. The national population estimates for 1981-88 on the CMF are not rounded so that the user can round them after aggregating across subgroups and avoid the rounding error problem.

3. National, state, and county population estimates can be identified by using the FIPS code or the record type variable in location 140. National population records

have a FIPS code of "00000". State population records have a valid 2-digit FIPS state code and a county code of "000" (see Appendix E). The record type variable assumes the value "1" for national records, "2" for state records, and "3" for county records.

It is necessary to provide separate sets of estimates for each geographic level because the methodology used to produce the intercensal estimates (1971-79 and 1981-88) did not smooth them sufficiently. Thus, for the intercensal years, the sum of the population estimates of counties within a state may not equal the state population estimate, and the sum of all state population estimates or all county population estimates may not equal the national population estimates. For these years, the national population estimates should be used when calculating national death rates and the state population estimates should be used when calculating state death rates.

4. The FIPS state and county codes contain leading zeros in both the 2-byte state code and the 3-byte county code.

5. For 1988, there was an additional county in Georgia with a "missing" county code of "999" (see Appendix E). The six records for this county have population counts of zero.

6. Brief description of population estimates for individual years

1968-69 population estimates - National population estimates are U.S. Bureau of the Census intercensal estimates of the July 1 resident population. State and county population estimates were calculated by NCHS using linear extrapolation from the corresponding July 1, 1970 and July 1, 1971 estimates.

1970 population estimates - National, state, and county population estimates are from a modified version of the April 1, 1970 census. The original census counts were modified by the U.S. Bureau of the Census to correct: 1) errors discovered in the data, 2) race misclassification - persons of Hispanic origin who reported their race as "other" were recoded as "white".

1971-79 population estimates - National and county estimates are U.S. Bureau of the Census intercensal estimates of the July 1 resident population. The Bureau of the Census did not produce state population estimates by age, race, and sex for the 70's. Therefore, the state population estimates for 1971-79 on this file are simply the sum of the population estimates for the counties in each state.

Three Virginia independent cities (Manassas, Manassas Park, and Poquoson) did not appear on the Census file prior to 1981. While these independent cities are not on the mortality file for 1968-78, they are on the file for 1979 onwards. Therefore, the 1979 populations for these three cities were estimated from the July 1, 1980 and July 1, 1981 estimates of these cities. The 1979 population estimates for the counties containing the cities were reduced by the estimated city populations.

1980 population estimates - National, state, and county population estimates are from a modified version of the April 1, 1980 census. The original census counts were modified by the U.S. Bureau of the Census: 1) persons who reported their race as "other" (the majority being of Hispanic origin) were reassigned to one of the official race groups, 2) an adjustment was made for the overcount of centenarians April 1, 1980 population estimates for three Virginia independent cities, (Manassas, Manassas Park, and Poquoson) had to be extrapolated from July 1, 1980 estimates. The April 1 populations for the three cities were calculated as a proportion of the April 1 county population, with the proportion obtained from the

July 1, 1980 city/county estimates. The April 1 population estimates for the counties containing the three cities were reduced by the estimated April 1 city populations.

1981-88 population estimates - National, state, and county estimates are U.S. Bureau of the Census intercensal estimates of the July 1 resident population.

3. Compressed Mortality File 1999-2002, CD-ROM Series 20, No. 2H, ASCII Version. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, pp 10-11

VI. Description of the Population File

The national, State, and county population estimates on the CMF are U.S. Census Bureau estimates of the resident population of the United States. The 1989 estimates are intercensal estimates of July 1 resident populations (based on the 1980 and 1990 censuses). The 1990 population estimates are April 1 MARS (modified age-race-sex) census counts. The 1991-98 population estimates are intercensal estimates of July 1 resident populations (based on the 1990 census and the bridged-race 2000 census). A brief description of the population estimates is provided here; a more detailed description is provided in Appendix D.

Specific details

1. National, State, and county population estimates can be identified by using the FIPS code or the record type variable in location 148. National population records have a FIPS code of "00000" and a record type code of "1". State population records have a nonzero 2-digit State FIPS code and a county code of "000" and a record type code of "2". County population records have nonzero 2-digit State and 3-digit county FIPS codes. The record type value for county records is "3" . See Appendix E and Appendix F for a complete listing of FIPS codes.

2. The population estimates for all years, 1989-98, were derived from files with the four single-race categories specified in the 1977 Office of Management and Budget standards on race and ethnicity: White, Black, American Indian or Alaska Native, and Asian or Pacific Islander (2). The American Indian or Alaska Native and Asian or Pacific Islander categories were collapsed to form the Other races category found on this file.

3. Because the methodology used to produce the intercensal estimates for the 1980's, did not smooth sufficiently, the sum of the population estimates for counties within a State does not equal the State estimate, and the sum of all State or all county population estimates does not equal the national estimate. Thus, for 1989, the national population estimates should be used when calculating national death rates and the State population estimates should be used when calculating State death rates.

4. To permit the calculation of infant mortality rates and maternal mortality rates, NCHS live-birth data are included on the file. The race codes for these records are derived from "race of mother".

An estimate of the population under one year of age is also on the file. The user should use the estimates of the population under 1 year of age when calculating rates for the total population. Note that if the estimate of the population under 1 year of age is used, the live

birth counts should not be included in the population estimate.

5. For 1989, the NCHS Division of Vital Statistics used national population estimates rounded to the nearest 1,000 to calculate published death rates. The national population estimates for 1989 on the CMF are not rounded so that the user can round after aggregating across subgroups.

6. For 1989 through 1991, there was an additional county in Georgia with a "missing" county code of "999" (see Appendix E). The six records for this county have population counts of zero.

7. The State and county FIPS codes contain leading zeros in both the 2-byte State code and the 3-byte county code.

8. Brief description of population estimates for individual years

1989 population estimates - National, State, and county estimates are U.S. Census Bureau intercensal estimates of the July 1 resident population, based on the 1980 and 1990 censuses. The Census Bureau's State and county population files had an estimate for the 0-4 year age group , not for <1 year and 1-4 years. The estimate for the 1-4 year group was obtained by multiplying the 0-4 year age group by 0.8; the estimate for <1 year age group was then obtained by subtraction.

1990 population estimates - National, State, and county population estimates are from the April 1, 1990 MARS (modified age-race-sex) census counts. The original census counts were modified by the U.S. Census Bureau: 1) to correct the bias in reported age -- about 10 percent of persons were actually a year younger as of April 1 than reported, 2) to assign persons who reported their race as "other" to one of the four single-race categories specified in the 1977 OMB standards on race and ethnicity (White, Black, American Indian or Alaska Native, Asian or Pacific Islander) (2).

1991-98 population estimates - National, State, and county population estimates are U.S. Census Bureau bridged-race intercensal estimates of the July 1 resident population, based on the 1990 census and the bridged-race 2000 census. Derivation of the race-specific intercensal population estimates for the 1990's was complicated by the incomparability of the race data on the 1990 and the 2000 censuses. Before the intercensal estimates for the 1990's could be derived, the race groups on the 2000 Census had to be made consistent with (bridged to) the race categories on the 1990 census (White, Black, American Indian or Alaska Native, and Asian or Pacific Islander).

3. Compressed Mortality File 1999-2002, CD-ROM Series 20, No. 2H, ASCII Version. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, January 2005, pp 12-14

VI. Description of the Population File

The national, State, and county population estimates on the CMF are bridged-race estimates of the resident population of the United States produced by the U.S. Census Bureau and released by NCHS on http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm (6-10). The modified age-race-sex 1999 estimates are intercensal estimates of July 1 resident populations (based on the 1990 census and the bridged modified race 2000 census). The 2000 population estimates are April 1 bridged modified race census counts. The national 2001 population estimates are estimates of the July 1 resident population from the Vintage 2001 bridged-race postcensal series. The national 2002 population estimates are estimates of the July 1, 2002 resident population from the Vintage 2002 bridged-race postcensal series. The state and county 2001 and 2002 population estimates are estimates of the July 1 resident population from the Vintage 2003 bridged-race postcensal series. A brief description of the population estimates is provided in this section; a more detailed description is provided in Appendix E.

Specific details
1.   National, State, and county population estimates can be identified by using the FIPS code or the record type variable in location 148. National population records have a FIPS code of "00000" and a record type code of "1". State population records have a nonzero 2-digit State FIPS code and a county code of "000" and a record type code of "2". County population records have nonzero 2-digit State and 3-digit county FIPS codes. The record type value for county records is "3". See Appendix G for a complete listing of FIPS codes.

2.   All of the population estimates on this file are derived from bridged-race population estimates files (see Appendix E and "Census populations with bridged-race categories" at http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm (6-10). Census 2000 collected race data in accordance with the 1997 Office of Management and Budget (OMB) standards for the collection of race and ethnicity (11). As race data on death certificates continues to be collected in accordance with the 1977 OMB standards, the Census 2000 race groups have been bridged to the four race categories specified in the 1977 OMB standards (12,13). These four categories are White, Black, American Indian or Alaska Native, and Asian or Pacific Islander. The American Indian or Alaska Native and Asian or Pacific Islander categories were collapsed to form the Other races category found on this file.

3.   The national, State, and county population estimates for 2000 are all derived from a county-level file and thus, are consistent with each other.

4.   The national estimates for 2001 are derived from the Vintage 2001 series and are not consistent with the State and county estimates for 2001 which were obtained from the Vintage 2003 county-level file. The national estimates for 2002 are from the Vintage 2002 series and are not consistent with the 2002 state and county estimates which are from the Vintage 2003 series. The State and county 2001 and 2002 estimates are consistent with each other because the State estimates were obtained 12 by summing the county estimates.

5. To permit the calculation of infant mortality rates and maternal mortality rates, NCHS live-birth data are included on the file. The race code for these records is derived from "race of mother". An estimate of the population under one year of age also is on the file. The user should use the estimates of the population under 1 year of age when calculating rates for the total population. Note that if the estimate of the population under 1 year of age is used, the live birth counts should not be included in the population estimate.

6. The State and county FIPS codes contain leading zeros in both the 2-byte State code and the 3-byte county code.

7. Brief description of population estimates for individual years

1999 population estimates - National, State, and county population estimates are bridged-race intercensal estimates of the July 1 resident population, based on the modified age, race, sex 1990 census and the bridged modified-race 2000 census (6). Derivation of the race-specific intercensal population estimates for the 1990=s was complicated by the incomparability of the race data on the 1990 and the 2000 censuses. Before the intercensal estimates for the 1990's could be derived, the race groups on the 2000 census had to be made consistent with (bridged to) the race categories on the 1990 census (White, Black, American Indian or Alaska Native, Asian or Pacific Islander) (13).

2000 population estimates - National, State, and county population estimates are from the April 1, 2000 bridged modified-race census counts (7). The original census counts were modified by the U.S. Census Bureau to assign persons who reported their race as "other" to one of the 31 single- or multiple-race groups specified in the 1997 OMB standards on race and ethnicity (11,14). The resulting counts were then bridged to (made consistent with) the four single-race categories on the 1990 census (White, Black, American Indian or Alaska Native, and Asian or Pacific Islander).

2001 population estimates - The national population estimates for 2001 are July 1 resident population estimates from the bridged-race Vintage 2001 postcensal series (8). The State and county population estimates are July 1 resident population estimates from the bridged-race Vintage 2003 postcensal series (10). The State estimates were obtained by summing the county estimates, so the State and county estimates are consistent with each other. The national estimates for 2001, however, are not consistent with the State and county estimates. The bridged-race population files have estimates for the four single-race categories (White, Black, American Indian or Alaska Native, and Asian or Pacific Islander).

2002 population estimates - The national population estimates for 2002 are July 1 resident population estimates from the bridged-race Vintage 2002 postcensal series (9). The State and county population estimates are July 1 resident population estimates from the bridged-race Vintage 2003 postcensal series (10). The State 13 estimates were obtained by summing the county estimates, so the State and county estimates are consistent with each other. The national estimates for 2002, however, are not consistent with the State and county estimates. The bridged-race population files have estimates for the four single-race categories (White, Black, American Indian or Alaska Native, and Asian or Pacific Islander).

4. Documentation of the Detail Mortality Tape File, 1959-67. Division of Vital Statistics.

DATA SOURCE: Data for 1959, 1960, and 1961 are based on information obtained from microfilm copies of the original death certificates (p.1) The 1959 tape file was given to the Division of Vital Statistics by a group that worked on a combined 1959-61 mortality special project for the American Public Health Association (APHA) (p.1)

5. Vital Statistics Instruction Manual, Part II, Coding and Punching, Section C, Geographic Code -- Final, Births, Deaths, and Fetal Deaths Occurring in 1960-61. U.S. Department of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics, Washington, February 1961.

DATA SOURCE: Geographic codes based on figures published by the U.S. Bureau of the Census in "Final Population Counts," Advance Reports, 1960 Census of Population, Series PC(A1). (p.4)

6. Vital Statistics Instruction Manual, Geographic Reference Manual, Codes Used in Computer Operations Effective With 1962 Data. U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Health Statistics, Washington, D.C. 20201

7. Multiple Cause of Death Public Use Tape, ICDA-8 (1968-1978), Documentation of Multiple Cause of Death, Public Use Tapes for ICDA-8 Data (1968-1978). December 1, 1980.

DATA Source: Data originally release as part of the NCHS micro data tape program, NCHS Standardized Micro-Data Transcripts, Hyattsville, Maryland, June 1978. (p.4)

8. Vital Statistics of the United States: Mortality, 1999, Technical Appendix, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control and Prevention, National Center for Health Statistics, Hyattsville, Maryland, July 2004.

Sources of data
Mortality statistics

Mortality statistics for 1999 are, as for all previous years except 1972, based on information from records of all deaths occurring in the United States.

The death-registration system of the United States encompasses the 50 States, the District of Columbia, New York City (which is independent of New York State for the purpose of death registration), Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands (Northern Marianas). In statistical tabulations, United States refers only to the aggregate of the 50 States (including New York City) and the District of Columbia. Data for Guam, Puerto Rico, Virgin Islands, American Samoa, and Northern Marianas are presented separately from data for the United States.

The Virgin Islands was admitted to the registration area for deaths in 1924; Puerto Rico, in 1932; and Guam, in 1970. Tabulations of death statistics for Puerto Rico and the Virgin Islands were regularly shown in *Vital Statistics of the United States* from the year of their admission through 1971 except for the years 1967-69, and tabulations for Guam were included for 1970 and 1971. Death statistics for Puerto Rico, the Virgin Islands, and Guam were not included in *Vital Statistics of the United States* for 1972 but have been included each year since 1973. Information for 1972 for these three areas was published in the respective annual vital statistics reports of the Department of Health of the Commonwealth of Puerto Rico, the Department of Health of the Virgin Islands, and the Department of Public Health and Social Services of the Government of Guam. Death statistics are available for American Samoa beginning with data year 1997 and for Northern Marianas beginning with data year 1998.

Procedures used by NCHS to collect death statistics have changed over the years. Before 1971 tabulations of deaths were based solely on information obtained by NCHS from copies of the original certificates. The information from these copies was edited, coded, and tabulated. For 1960-70 all mortality information taken from these records was transferred by NCHS to magnetic tape for computer processing.

Beginning with 1971 an increasing number of States have provided NCHS, via the Vital Statistics Cooperative Program (VSCP), with electronic files of data coded according to NCHS specifications. The year in which State-coded demographic data were first transmitted in electronic data files to NCHS is shown below for each of the States, New York City, the District of Columbia, Puerto Rico, and the Virgin Islands, all of which now furnish demographic or nonmedical data in electronic data files. (p7)

eAPPENDIX 2: PREMATURE MORTALITY AND GEOGRAPHY

In this appendix, we present supplemental material regarding the definition employed for premature mortality (death before age 65) and considerations pertaining to the geographic areas analyzed (entire US versus sub-regions, whether defined by geography and/or racial/ethnic composition).

1) Premature mortality

We employed age 65 as the cut-off for "premature mortality" because this was the accepted US federal health agency definition of premature mortality in the 1960s up until the mid-1970s, when analyses began also using age 75 as a cut-point – while still retaining, as the CDC does to this day, use of 65 as the cut-point for the metric of "Years of Person Lives Lost."[20,21] Thus, by defining premature death as death before age 65, we use the appropriate age for the 1960s, one which also provides a conservative estimate of premature mortality for later periods. The conservative nature of this test is a central feature of our analyses. For relevant websites discussing these issues, see:

http://www.cdc.gov/mmwr/preview/mmwrhtml/00001773.htm

http://www.cdc.gov/pcd/issues/2012/11_0120.htm

http://www.countyhealthrankings.org/our-approach/health-outcomes/premature-death

An additional advantage of using age 65 as the cut-point for premature death is that it renders our results capable of being compared to other US government reports and scientific studies that have likewise consistently defined age at premature death as death before age 65.

2) Geography

As noted in the introduction and discussion, prior analyses of the health impact of Jim Crow have been restricted to specific sub-regions or specific states in the US, especially in the US South. As shown by Figure 1, however, Jim Crow laws were not restricted to the US South, rendering it appropriate to study the impact of the abolition of Jim Crow in relation to the US as a whole. Nevertheless, one complicating factor is the data limitation we discuss in the text, regarding the 1960-1967 mortality data using solely the categories of "white" and "non-white." The conventional solution to this problem, which we also employ, is to treat "non-white" as equivalent to "black," given that 92% of the US "non-white" population in 1960 was black, noting, as we also state in the text, that the likely results would be to produce conservative estimates of black/white health inequities (given that the health status of the "non-black non-white" population was likely better than that of the black population). One important caveat, however, concerns state variation in the "% black" among the "non-white" population, as shown in the table we have prepared, below, which highlights states in which 90% and 95% of the "nonwhite" population was black, as classified by the US census.

State	N	1960: state population

		Total	White (W) (N)	Black (B) (N)	"remainder"	NW (non-W) (N)	% NW = B	% NW = B ≥90%	% NW = B ≥95%
Jim Crow polity									
Alabama	1	**3266740**	**2283609**	**980271**	**2860**	**983131**	**0.997091**	X	X
Arizona	2	1302161	1169517	43403	89241	132644	0.327214		
Arkansas	3	**1786272**	**1395703**	**388787**	**1782**	**390569**	**0.995437**	X	X
Delaware	4	**446292**	**384327**	**60688**	**1277**	**61965**	**0.979392**	X	X
Florida	5	**4951560**	**4063881**	**880186**	**7493**	**887679**	**0.991559**	X	X
Georgia	6	**3943116**	**2817223**	**1122596**	**3297**	**1125893**	**0.997072**	X	X
Kansas	7	2178611	2078666	91445	8500	99945	0.914953	X	
Kentucky	8	**3038156**	**2820083**	**215949**	**2124**	**218073**	**0.99026**	X	X
Louisiana	9	**3257022**	**2211755**	**1039207**	**6060**	**1045267**	**0.994202**	X	X
Maryland	10	**3100689**	**2573919**	**518410**	**8360**	**526770**	**0.98413**	X	X
Mississippi	11	**2178141**	**1257546**	**915743**	**4852**	**920595**	**0.994729**	X	X
Missouri	12	**4319813**	**3922967**	**390853**	**5993**	**396846**	**0.984898**	X	X
New Mexico	13	951023	875763	17063	58197	75260	0.226721		
North Carolina	14	**4556155**	**3399285**	**1116021**	**40849**	**1156870**	**0.96469**	X	X
Oklahoma	15	2328284	2107900	153084	67300	220384	0.694624		
South Carolina	16	**2382594**	**1551022**	**829291**	**2281**	**831572**	**0.997257**	X	X
Tennessee	17	**3567677**	**2977753**	**586876**	**3048**	**589924**	**0.994833**	X	X
Texas	18	**9579677**	**8374831**	**1187125**	**17721**	**1204846**	**0.985292**	X	X
Virginia	19	**3966949**	**3142443**	**816258**	**8248**	**824506**	**0.989996**	X	X
West Virginia	20	**1860421**	**1770133**	**89378**	**910**	**90288**	**0.989921**	X	X
Wyoming	21	330066	322922	2183	4961	7144	0.305571		
Non-Jim Crow polity									
Alaska	1	226167	174546	6711	44910	51621	0.130005		
California	2	15717204	14455230	883861	378113	1261974	0.70038		
Colorado	3	1753947	1700700	39992	13255	53247	0.751066		
Connecticut	4	**2535234**	**2423816**	**107449**	**3969**	**111418**	**0.964377**	X	X
District of Columbia	5	**763956**	**345263**	**411737**	**6956**	**418693**	**0.983386**	X	X
Hawaii	6	632772	202230	4943	425599	430542	0.011481		
Idaho	7	667191	657383	1502	8306	9808	0.15314		
Illinois	8	**10081158**	**9010252**	**1037470**	**33436**	**1070906**	**0.968778**	X	X
Indiana	9	**4662498**	**4388554**	**269275**	**4669**	**273944**	**0.982956**	X	X
Iowa	10	2757537	2727709	25354	4474	29828	0.850007		
Maine	11	969265	963291	3318	2656	5974	0.555407		
Massachusetts	12	5148578	5023144	111842	13592	125434	0.89164		
Michigan	13	**7823194**	**7085865**	**717581**	**19748**	**737329**	**0.973217**	X	X
Minnesota	14	3413864	3371603	22263	19998	42261	0.526798		
Montana	15	674767	650738	1467	22562	24029	0.061051		
Nebraska	16	1411330	1374764	29262	7304	36566	0.800252		
Nevada	17	2825278	263443	13484	2548351	2561835	0.005263		
New Hampshire	18	606921	604334	1903	684	2587	0.735601		
New Jersey	19	**6066782**	**5539003**	**514875**	**12904**	**527779**	**0.97555**	X	X
New York	20	**16728304**	**15287071**	**1417511**	**23722**	**1441233**	**0.98354**	X	X
North Dakota	21	632446	619538	777	12131	12908	0.060195		
Ohio	22	**9706397**	**8909698**	**786097**	**10602**	**796699**	**0.986693**	X	X
Oregon	23	1768687	1732037	18133	18517	36650	0.494761		
Pennsylvania	24	**11319366**	**10454004**	**852750**	**12612**	**865362**	**0.985426**	X	X
Rhode Island	25	859488	838712	18332	2444	20776	0.882364		
South Dakota	26	680514	653098	1114	26302	27416	0.040633		
Utah	27	890627	873828	4148	12651	16799	0.246919		
Vermont	28	389881	389092	519	270	789	0.657795		
Washington	29	2853214	2752675	48738	51801	138116	0.352877		
Wisconsin	30	3951777	3858903	74546	18328	92874	0.327214		

Note: bold font for states for which % NW = B ≥90%

Data source: Hobbs F, Stoops N. US Census Bureau, Census 2000 Special Reports, Series CENSR-4, Demographic Trends in the 20th Century. Washington, DC: US government Printing Office, 2002.

In light of the observed state heterogeneity in "% black" among the "non-white" population, an alternative approach might be to restrict analyses to those US states in which the "non-white" population was predominantly black, as classified by the US census. As shown by the above table, however, this alternative solution introduces more severe additional problems, due to differential selection bias for the Jim Crow versus non-Jim Crow states. Specifically, for the 95%

cutpoint, 76% of the Jim Crow states would be included but only 31% of the non-Jim Crow states would be included. Thus, selecting cases for comparison on this basis would introduce serious bias, and render the counterfactuals implausible. The preferred solution is the one we have used, i.e., employing data on all US states, since the most likely consequence is, as noted above, that of introducing a conservative bias, thereby furthering bolstering our findings.

```
                    13_krieger et al_EPIDEMIOL EDE13-343_HAPC_sascode.txt
*******************
        MortalityData contains the following variables:

        count           count of deaths
        logden          log of the population at risk (offset in the Poisson model)
        agecat          age category, in 5 year increments
        agecat2         age category squared, for quadratic specification of age
        period          period, in 5 year increments
        cohort          cohort, in 5 year increments
        JimCrow         Jim Crow indicator, 0 if state was NJC and 1 if state was JC
        stfips          state indicator
        cntyFips        county indicator
        countyIncome    county median family income quintile

        Poisson log linear models are fit using PROC GLIMMIX.
        IC=PQ option gives BIC and other model fit statistics
        nloptions tech=nnridg specifies Newton-Raphson ridge optimization algorithm.
        TestDataSet and covtest statement tests the variance components.

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*******************
Model 1: Basic HAPC model
*******************.
                    ;
data TestDataSet ;
        input covp1 covp2 ;
        datalines ;
0 .
. 0
;
run ;

ods output parameterEstimates=model1_fixed ;
ods output solutionR=model1_rand ;
proc glimmix data=MortalityData IC=PQ;
        by race ;
        class period cohort  ;
        model count = agecat agecat2  /dist=poi link=log offset=logden s ;
                        random period / s ;
                        random cohort /s ;
                        nloptions tech=nrridg ;
                        covtest testdata=testDataSet / parms ;
run ;




*******************
Model 1: HAPC model with main JC effect and period*JC and cohort*JC interactions
*******************.
                    ;
data TestDataSet ;
        input covp1 covp2 covp3 covp4 ;
        datalines ;
0 . . .
. 0 . .
. . 0 .
. . . 0
;
run ;

ods output parameterEstimates=model2_fixed ;
ods output solutionR=model2_rand ;
proc glimmix data=MortalityData IC=PQ ;
```

```
                by race ;
                class period cohort  ;
                model  count = agecat agecat2 jc /dist=poi link=log offset=logden s corrb ;
                            random period period*jc / s ;
                            random cohort cohort*jc /s ;
                            nloptions tech=nrridg ;
                            covtest testdata=testDataSet / parms ;
run ;


********************
Model 3: HAPC model with main JC effect and period*JC and cohort*JC interactions and
state random effects
********************;

data TestDataSet ;
        input covp1 covp2 covp3 covp4 covp5 ;
        datalines ;
0 . . . .
. 0 . . .
. . 0 . .
. . . 0 .
. . . . 0
;
run ;

ods output parameterEstimates=model3_fixed ;
ods output solutionR=model3_rand ;
proc glimmix data=MortalityData IC=PQ;
        by race ;
        class period cohort stfips ;
        model  count = agecat agecat2 jc /dist=poi link=log offset=logden s  ;
                        random period period*jc / s ;
                        random cohort cohort*jc /s ;
                        random stfips /s ;
                        nloptions tech=nrridg ;
                        covtest testdata=testDataSet / parms ;
run ;



********************
Model 3: HAPC model with main JC effect and period*JC and cohort*JC interactions and
state random effects
and county random effects
********************;

data TestDataSet ;
        input covp1 covp2 covp3 covp4 covp5 covp6 ;
        datalines ;
0 . . . . .
. 0 . . . .
. . 0 . . .
. . . 0 . .
. . . . 0 .
. . . . . 0
;
run ;

ods output parameterEstimates=model4_fixed ;
ods output solutionR=model4_rand ;
proc glimmix data=MortalityData IC=PQ;
        by race ;
        class period cohort stfips fipschar ;
        model  count = agecat agecat2 jc /dist=poi link=log offset=logden s  ;
```

```
                            random period period*jc / s ;
                            random cohort cohort*jc /s ;
                            random stfips /s ;
                            random fipschar /s ;
                            nloptions tech=nrridg ;
                            covtest testdata=testDataSet / parms ;

run ;

*********************
Model 7: HAPC model with main JC effect and period*JC and cohort*JC interactions and
state random effects
and county random effects and county income quintile effects
*********************;

data TestDataSet ;
        input covp1 covp2 covp3 covp4 covp5 covp6 ;
        datalines ;
0 . . . . .
. 0 . . . .
. . 0 . . .
. . . 0 . .
. . . . 0 .
. . . . . 0
;
run ;

ods output parameterEstimates=model5_fixed ;
ods output solutionR=model5_rand ;
proc glimmix data=MortalityData IC=PQ;
        by race ;
        class period cohort stfips fipschar incomeQuintileRev;
        model age5count = agecat agecat2 jc incomeQuintileRev /dist=poi link=log
offset=logden s ;
                            random period period*jc / s ;
                            random cohort cohort*jc /s ;
                            random stfips /s ;
                            random fipschar /s ;
                            nloptions tech=nrridg ;
                            covtest testdata=testDataSet / parms ;
run ;
```

eTable 1. Study population: number of deaths and person-years at risk, for the US black and white population, by Jim Crow polity, for: age, period, and cohort, 1960-2009.

	Black				White			
	Jim Crow		Non-Jim Crow		Jim Crow		Non-Jim Crow	
	Deaths	Person-years at risk	Deaths	Person-years at risk	Deaths	Person-years at risk	Deaths	Person-years at risk
Total	3,572,268	759,989,821	2,935,497	616,857,474	10,128,147	3,318,204,592	16,701,773	5,695,528,709
Age (yr)								
≤ 4	471,991	80,198,480	392,228	64,326,846	801,281	279,151,465	1,371,942	482,468,604
5-9	33,130	80,467,351	24,217	63,538,644	82,371	280,897,263	133,975	491,284,596
10-14	34,765	82,133,047	23,860	63,029,437	88,736	287,989,830	137,865	505,199,794
15-19	100,061	80,078,184	77,386	59,547,642	272,565	290,381,002	394,731	501,431,961
20-24	114,966	70,897,906	95,020	55,481,455	335,478	290,061,127	479,847	485,390,046
25-29	144,828	62,699,411	128,134	53,307,374	314,361	281,417,298	465,016	475,591,068
30-34	163,083	58,203,936	151,346	51,040,919	363,259	274,963,708	540,369	467,243,157
35-39	213,315	54,322,382	198,180	47,338,924	484,296	264,769,454	748,381	450,880,022
40-44	277,062	50,125,545	251,695	42,772,647	661,000	253,058,328	1,030,977	433,206,695
45-49	358,734	44,449,467	304,024	37,419,749	998,958	236,334,780	1,628,199	407,973,575
50-54	446,216	37,932,384	365,545	31,632,023	1,311,242	214,853,437	2,168,843	373,517,701
55-59	537,617	31,931,339	419,625	26,368,702	1,913,688	192,831,800	3,309,351	332,529,070
60-64	676,500	26,550,388	504,237	21,053,112	2,500,912	171,495,101	4,292,277	288,812,420
Period								
1960-1964	433,908	59,389,819	409,706	58,294,009	986,201	250,915,173	2,475,304	586,427,049
1965-1969	397,058	58,170,571	376,364	49,623,978	995,267	258,524,595	2,214,323	543,963,944
1970-1974	363,110	60,091,427	276,039	48,867,188	1,040,669	278,935,825	1,888,167	536,523,153

1975-1979	319,213	64,312,907	251,971	52,547,235	989,798	300,895,157	1,688,469	542,047,483
1980-1984	303,364	69,795,670	251,744	56,700,273	975,062	321,972,774	1,549,991	546,371,872
1985-1989	314,059	74,097,593	279,073	60,708,026	956,983	337,929,481	1,464,193	552,372,689
1990-1994	342,172	80,606,921	296,096	66,094,808	950,601	354,305,108	1,380,039	569,113,768
1995-1999	350,192	89,910,915	271,104	71,154,600	976,142	380,479,618	1,300,502	588,809,739
2000-2004	364,498	97,792,474	261,739	75,198,785	1,075,143	404,872,815	1,340,392	608,628,415
2005-2009	384,694	105,821,524	261,661	77,668,572	1,182,281	429,374,046	1,400,393	621,270,597

Birth Cohort

1901-1905	75,112	1,946,201	61,286	1,783,218	209,317	10,858,493	621,598	29,835,260
1906-1910	129,759	4,622,709	110,505	3,995,615	395,745	25,030,298	1,038,727	61,248,558
1911-1915	185,142	7,669,805	144,603	6,412,822	577,751	42,451,177	1,295,292	96,200,161
1916-1920	196,114	11,072,199	154,806	9,611,618	642,950	62,714,687	1,306,548	135,901,622
1921-1925	229,784	14,470,584	197,778	13,512,423	760,199	86,099,560	1,415,164	177,665,075
1926-1930	240,493	18,029,339	218,364	17,927,448	799,194	109,129,803	1,371,640	213,794,645
1931-1935	237,421	21,265,401	214,165	21,453,010	760,316	125,501,271	1,203,829	233,402,481
1936-1940	231,096	24,750,365	200,423	24,528,480	724,698	143,158,844	1,048,497	251,486,104
1941-1945	245,803	31,327,322	207,326	29,579,338	778,126	180,714,745	1,076,508	307,356,979
1946-1950	284,120	43,874,625	227,169	37,035,992	914,579	245,797,728	1,238,395	412,395,010
1951-1955	275,651	60,251,757	219,815	47,372,131	784,089	290,189,230	1,093,064	500,124,444
1956-1960	238,963	73,686,922	189,266	56,871,520	621,325	318,109,760	874,375	556,618,394
1961-1965	291,613	80,942,665	236,470	64,060,839	657,828	331,387,145	1,016,444	581,490,368

1966-1970	195,980	70,293,390	162,327	55,299,156	433,757	279,530,906	657,427	474,029,055
1971-1975	132,193	59,700,801	100,597	46,892,198	301,148	233,971,998	419,661	379,020,382
1976-1980	98,920	51,565,792	73,248	39,032,176	210,793	192,937,140	284,170	299,246,866
1981-1985	79,700	49,026,120	59,376	36,355,370	175,765	176,728,568	232,174	273,670,635
1986-1990	62,107	43,281,238	49,750	32,642,582	131,598	151,090,640	177,810	236,961,440
1994-1995	49,493	37,499,580	41,795	29,882,662	90,763	123,639,474	127,389	196,731,392
1996-2000	32,876	27,252,864	25,627	21,797,871	56,711	91,531,859	78,848	140,798,364
2001-2005	30,524	17,867,441	21,285	13,711,921	52,350	63,535,794	66,273	91,117,243
2006-2009	29,404	9,592,700	19,516	7,099,085	49,145	34,095,469	57,942	46,434,232

eTable 2. Age-specific and age-standardized[a] mortality rates (per 100,000, for deaths < 65) for the US black and white population, by Jim Crow polity and time period, 1960-2009.

Age-specific mortality rate (per 100,000)[b]

Age group (years)	Race/ethnicity	JC polity	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
≤ 4	Black	JC	1196.6	1031.8	763.1	637.8	512.3	469.2	408.9	332.3	325.0	306.5
		non-JC	1147.8	1241.6	747.3	629.3	534.9	514.3	436.4	320.7	289.6	274.9
	White	JC	592.5	499.2	410.9	319.7	263.9	223.5	185.5	160.0	153.7	144.1
		non-JC	537.3	484.2	358.6	296.8	246.5	213.3	173.9	142.8	133.4	124.8
5-9	Black	JC	72.2	71.6	56.6	44.9	37.5	34.5	31.5	27.5	21.6	20.9
		non-JC	64.1	70.6	49.2	41.9	35.5	33.6	30.0	24.1	19.5	18.3
	White	JC	48.3	47.1	42.9	35.5	29.5	25.5	21.2	18.7	15.9	14.1
		non-JC	45.1	43.9	36.0	30.4	25.8	21.7	18.2	15.3	12.9	12.0
10-14	Black	JC	67.3	65.1	56.5	44.8	37.8	38.0	37.5	34.2	27.7	23.6
		non-JC	52.8	61.5	48.8	41.6	35.6	37.1	35.8	29.9	24.9	20.4
	White	JC	45.0	44.5	42.8	35.5	29.6	28.3	25.4	23.5	20.5	16.4
		non-JC	39.0	39.4	35.8	30.0	25.5	23.9	21.7	19.2	16.5	13.6
15-19	Black	JC	133.4	162.7	170.2	124.5	106.5	111.3	151.0	122.3	98.1	94.0
		non-JC	117.5	178.5	190.7	137.6	113.4	121.7	159.3	122.4	96.9	90.9
	White	JC	101.2	117.5	110.2	106.2	102.3	89.8	86.8	78.1	75.8	77.4
		non-JC	81.5	101.0	97.2	94.7	83.1	73.5	72.1	62.4	57.0	56.1
20-24	Black	JC	228.0	245.6	214.4	154.7	130.5	145.9	183.2	154.5	133.1	122.2
		non-JC	205.0	261.7	240.5	170.2	140.0	161.1	190.5	153.7	131.2	121.2
	White	JC	124.3	136.3	138.3	129.7	123.2	117.1	102.6	96.9	102.3	97.0
		non-JC	106.1	123.1	124.6	117.4	101.5	97.6	87.3	78.7	77.7	72.0
25-29	Black	JC	304.8	344.7	339.9	259.7	217.6	223.7	242.8	201.1	177.7	164.6
		non-JC	271.4	361.7	330.5	276.2	244.8	260.6	254.9	186.8	160.6	149.1
	White	JC	119.8	124.9	127.9	117.8	116.5	110.1	110.1	97.2	98.8	107.7
		non-JC	103.0	113.3	110.4	107.1	101.3	102.0	100.2	82.2	78.0	81.8
30-34	Black	JC	406.9	438.9	403.5	295.3	246.1	275.8	312.0	257.6	206.7	186.2
		non-JC	399.4	482.3	392.7	309.9	275.1	320.5	326.4	238.7	188.1	166.9
	White	JC	149.4	151.2	151.1	128.4	128.1	135.0	141.4	124.3	115.2	119.9
		non-JC	130.9	137.3	130.6	117.1	111.3	124.1	126.9	104.7	90.8	91.2
35-39	Black	JC	602.1	666.7	560.0	454.8	373.4	374.8	402.0	347.7	285.3	268.1

Age	Race	Type										
		non-JC	577.3	739.4	511.7	414.2	370.0	443.5	478.6	360.1	261.4	240.4
	White	JC	223.3	243.3	218.3	189.0	166.0	164.3	178.5	169.4	165.6	174.3
		non-JC	204.6	233.0	190.9	164.7	148.8	158.7	171.7	148.2	134.0	137.7
40-44	Black	JC	867.4	900.5	860.8	669.5	537.7	513.4	524.9	486.0	434.0	354.8
		non-JC	845.0	1068.9	790.9	616.9	533.2	608.3	624.6	500.5	396.5	317.8
	White	JC	357.2	355.5	334.4	279.2	239.1	223.4	230.2	236.2	248.8	226.5
		non-JC	334.1	338.6	292.0	243.9	214.7	214.8	219.6	204.3	199.9	175.5
45-49	Black	JC	1134.7	1257.7	1118.7	979.2	834.4	749.7	741.6	687.5	643.2	613.6
		non-JC	1115.2	1413.6	1030.4	902.6	792.4	737.4	718.9	668.9	631.3	583.7
	White	JC	543.6	588.5	550.4	497.2	431.4	369.4	352.8	339.6	358.5	396.3
		non-JC	548.1	586.7	499.3	456.4	405.1	346.0	325.5	303.4	302.8	318.0
50-54	Black	JC	1844.2	1407.4	1671.5	1397.8	1221.5	1187.8	1139.4	1031.6	937.8	814.9
		non-JC	1704.4	1452.6	1539.2	1301.0	1167.2	1173.1	1105.7	1005.4	916.7	781.6
	White	JC	876.5	686.7	824.1	702.3	622.7	584.8	541.3	509.1	520.3	512.9
		non-JC	902.2	692.7	746.8	641.4	578.4	548.7	499.0	454.4	438.9	409.9
55-59	Black	JC	2341.5	2452.6	2089.9	1866.7	1800.4	1664.1	1543.4	1431.1	1317.8	1222.5
		non-JC	2167.2	2619.9	1894.7	1682.4	1688.0	1587.1	1413.2	1281.2	1182.1	1157.3
	White	JC	1294.4	1387.6	1264.9	1141.3	1065.5	971.0	898.7	822.9	774.3	796.7
		non-JC	1363.1	1477.6	1243.2	1101.6	1028.9	932.5	833.7	750.6	688.6	673.9
60-64	Black	JC	3859.4	3362.4	3061.2	2686.5	2552.2	2535.1	2395.8	2265.6	2056.2	1785.1
		non-JC	3436.8	3731.9	2797.8	2489.4	2453.9	2423.8	2205.1	2036.8	1844.8	1663.2
	White	JC	1927.7	1883.3	1847.9	1639.5	1497.6	1468.3	1388.4	1299.0	1211.6	1073.8
		non-JC	2083.4	2120.2	1830.7	1600.4	1454.8	1418.6	1296.0	1189.8	1077.1	933.7
Age-standard-ized (<65)	Black	JC	854.5	822.5	754.7	632.0	556.3	537.2	529.2	477.6	429.8	386.6
		non-JC	798.2	910.4	704.0	594.5	544.7	552.9	530.8	454.0	398.5	360.6
	White	JC	412.8	403.0	389.3	340.2	306.3	285.3	270.7	253.0	248.2	244.2
		non-JC	410.9	410.0	360.7	316.7	285.4	269.3	250.3	224.9	210.4	199.3

notes:
(a) age standard: US 2000 million standard
(b) shading along the diagonal identifies groups in same birth cohort
(c) the 95% confidence intervals for the rates are provided in eTable 1 and are not shown because they are very tight, given the large Ns (both N of cases and N of person-years).

eTable 3: Age-specific and age-standardized[a] mortality rates and 95% confidence interval (per 100,000, deaths before age 65) for the US black and white population by time period and Jim Crow polity

Black: Jim Crow polity

					Period					
age	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
<4	1196.6 (1189.4, 1198.5)	1031.8 (1024.5, 1033.6)	763.1 (756.6, 764.9)	637.8 (631.7, 639.3)	512.3 (507.1, 513.7)	469.2 (464.4, 470.6)	408.9 (404.6, 410.2)	332.3 (328.4, 333.4)	325.0 (321.2, 326.0)	306.5 (303.0, 307.5)
5-9	72.2 (70.4, 74.1)	71.6 (69.7, 73.4)	56.6 (54.9, 58.4)	44.9 (43.3, 46.4)	37.5 (36.0, 38.9)	34.5 (33.2, 35.8)	31.5 (30.3, 32.7)	27.5 (26.4, 28.6)	21.6 (20.7, 22.6)	20.9 (20.0, 21.8)
10-14	67.3 (65.4, 69.1)	65.1 (63.3, 66.9)	56.5 (54.8, 58.1)	44.8 (43.3, 46.3)	37.8 (36.4, 39.2)	38 (36.6, 39.5)	37.5 (36.2, 38.8)	34.2 (33.0, 35.4)	27.7 (26.6, 28.7)	23.6 (22.7, 24.6)
15-19	133.4 (130.4, 136.3)	162.7 (159.6, 165.7)	170.2 (167.2, 173.1)	124.5 (122.1, 126.9)	106.5 (104.2, 108.7)	111.3 (109.0, 113.7)	151.0 (148.3, 153.8)	122.3 (120.0, 124.6)	98.1 (96.1, 100.1)	94.0 (92.1, 95.9)
20-24	228.0 (223.4, 232.5)	245.6 (241.1, 250.1)	214.4 (210.6, 218.2)	154.7 (151.8, 157.6)	130.5 (128.0, 133)	145.9 (143.2, 148.6)	183.2 (180.1, 186.3)	154.5 (151.7, 157.2)	133.1 (130.7, 135.5)	122.2 (120.0, 124.4)
25-29	304.8 (299.2, 310.5)	344.7 (338.7, 350.8)	339.9 (334.2, 345.6)	259.7 (255.5, 263.9)	217.6 (214.2, 221.1)	223.7 (220.4, 227.1)	242.8 (239.2, 246.3)	201.1 (197.9, 204.4)	177.7 (174.7, 180.7)	164.6 (162.0, 167.3)
30-34	406.9 (400.3, 413.5)	438.9 (431.8, 446.1)	403.5 (396.8, 410.3)	295.3 (290.1, 300.4)	246.1 (242.0, 250.1)	275.8 (271.9, 279.7)	312.0 (308.1, 316)	257.6 (254.1, 261.2)	206.7 (203.5, 209.9)	186.2 (183.1, 189.2)
35-39	602.1 (594.0, 610.1)	666.7 (657.7, 675.6)	560.0 (551.6, 568.4)	454.8 (447.5, 462.0)	373.4 (367.6, 379.3)	374.8 (369.8, 379.8)	402.7 (397.3, 406.7)	347.7 (343.6, 351.8)	285.3 (281.6, 289.0)	268.1 (264.5, 271.7)
40-44	867.4 (857.5, 877.4)	900.5 (890.0, 910.9)	860.8 (850.5, 871.2)	669.5 (660.3, 678.6)	537.7 (530.0, 545.4)	513.4 (506.6, 520.2)	524.9 (519.1, 530.8)	486.0 (481.0, 491.0)	434.0 (429.5, 438.6)	354.8 (350.7, 358.9)
45-49	1134.7 (1123.1, 1146.2)	1257.7 (1245.1, 1270.3)	1118.7 (1106.7, 1130.7)	979.2 (968.0, 990.4)	834.4 (824.2, 844.5)	749.7 (740.6, 758.9)	741.6 (733.4, 749.9)	687.5 (680.8, 694.1)	643.2 (637.4, 649.0)	613.6 (608.2, 618.9)
50-54	1844.2 (1828.3, 1860)	1407.4 (1393.3, 1421.4)	1671.5 (1656.4, 1686.5)	1397.8 (1384.2, 1411.4)	1221.5 (1208.9, 1234.0)	1187.8 (1175.4, 1200.2)	1139.4 (1127.9, 1150.9)	1031.6 (1022.0, 1041.3)	937.8 (930.0, 945.6)	814.9 (808.3, 821.5)
55-59	2341.5 (2322.6, 2360.4)	2452.6 (2433.3, 2472.0)	2089.9 (2072.2, 2107.5)	1866.7 (1850.3, 1883.0)	1800.4 (1784.8, 1816.1)	1664.1 (1649.0, 1679.3)	1543.4 (1529.0, 1557.9)	1431.1 (1418.2, 1444.0)	1317.8 (1306.8, 1328.8)	1222.5 (1213.5, 1231.6)
60-64	3859.4 (3831.8, 3887.0)	3362.4 (3337.7, 3387.2)	3061.2 (3038.8, 3083.7)	2686.5 (2666, 2706.9)	2552.2 (2532.5, 2571.9)	2535.1 (2515.8, 2554.5)	2395.8 (2377.1, 2414.6)	2265.6 (2247.9, 2283.4)	2056.2 (2040.4, 2072.0)	1785.1 (1772.0, 1798.2)
<65[a]	854.5 (851.8, 857.2)	822.5 (819.8, 825.2)	754.7 (752.2, 757.3)	632.0 (629.7, 634.3)	556.3 (554.2, 558.4)	537.2 (535.3, 539.2)	529.2 (527.4, 531.0)	477.6 (476.0, 479.2)	429.8 (428.4, 431.3)	386.6 (385.4, 387.8)

Black: non-Jim Crow polity

					Period					
age	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
<4	1147.8 (1140.4, 1149.7)	1241.6 (1232.6, 1243.7)	747.3 (740.0, 749.1)	629.3 (622.5, 631.0)	534.9 (528.9, 536.5)	514.3 (508.6, 515.8)	436.4 (431.6, 437.8)	320.7 (316.5, 321.8)	289.6 (285.6, 290.6)	274.9 (271.1, 275.9)
5-9	64.1 (62.2, 65.9)	70.6 (68.5, 72.7)	49.2 (47.4, 51.0)	41.9 (40.2, 43.6)	35.5 (33.9, 37.0)	33.6 (32.1, 35.1)	30.0 (28.7, 31.4)	24.1 (22.9, 25.2)	19.5 (18.4, 20.5)	18.3 (17.2, 19.3)
10-14	52.8 (50.9, 54.7)	61.5 (59.5, 63.6)	48.8 (47.1, 50.6)	41.6 (40.0, 43.2)	35.6 (34.1, 37.1)	37.1 (35.5, 38.7)	35.8 (34.3, 37.3)	29.9 (28.6, 31.2)	24.9 (23.8, 26.0)	20.4 (19.4, 21.4)
15-19	117.5 (114.3, 120.7)	178.5 (174.7, 182.4)	190.7 (187.0, 194.4)	137.6 (134.6, 140.5)	113.4 (110.8, 116.0)	121.7 (118.9, 124.5)	159.3 (156.1, 162.6)	122.4 (119.7, 125.2)	96.9 (94.5, 99.2)	90.9 (88.7, 93.0)
20-24	205 (200.8, 209.3)	261.7 (256.7, 266.7)	240.5 (236, 245.0)	170.2 (166.7, 173.6)	140.0 (137.1, 143.0)	161.1 (157.9, 164.2)	190.5 (187.0, 194.0)	153.7 (150.5, 156.9)	131.2 (128.3, 134.0)	121.2 (118.5, 123.8)
25-29	271.4 (266.6, 276.1)	361.7 (355.7, 367.7)	330.5 (324.7, 336.3)	276.2 (271.4, 280.9)	244.8 (240.7, 248.9)	260.6 (256.6, 264.6)	254.9 (250.9, 258.8)	186.8 (183.3, 190.3)	160.6 (157.3, 163.8)	149.1 (146.1, 152.1)
30-34	399.4 (393.8, 405.0)	482.3 (475.2, 489.4)	392.7 (386.0, 399.4)	309.9 (304.4, 315.5)	275.1 (270.4, 279.7)	320.5 (315.9, 325.1)	326.4 (322.0, 330.8)	238.7 (234.9, 242.5)	188.1 (184.6, 191.5)	166.9 (163.6, 170.2)
35-39	577.3 (570.5, 584.1)	739.4 (730.3, 748.4)	511.7 (503.5, 519.8)	414.2 (407.1, 421.3)	370.0 (363.9, 376.2)	443.5 (437.5, 449.4)	478.6 (472.9, 484.2)	360.1 (355.4, 364.8)	261.4 (257.4, 265.4)	240.4 (236.5, 244.3)

age									
40-44	845.0 (836.0, 854.0)	1068.9 (1057.6, 1080.2)	790.9 (780.7, 801.1)	616.9 (608.0, 625.9)	533.2 (525.3, 541.2)	608.3 (600.3, 616.2)	624.6 (617.6, 631.7)	500.5 (494.6, 506.3)	396.5 (391.6, 401.5)	317.8 (313.3, 322.3)
45-49	1115.2 (1104.1, 1126.2)	1413.6 (1399.8, 1427.3)	1030.4 (1018.3, 1042.6)	902.6 (891.3, 913.8)	792.4 (782.0, 802.8)	737.4 (727.9, 746.9)	718.9 (710.1, 727.6)	668.9 (661.5, 676.4)	631.3 (624.6, 638.0)	583.7 (577.6, 589.8)
50-54	1704.4 (1689.2, 1719.5)	1452.6 (1437.3, 1467.9)	1539.2 (1523.5, 1554.9)	1301.0 (1287.1, 1314.9)	1167.2 (1154.2, 1180.2)	1173.1 (1160.1, 1186.0)	1105.7 (1093.9, 1117.6)	1005.4 (995.0, 1015.9)	916.7 (907.8, 925.6)	781.6 (773.9, 789.3)
55-59	2167.2 (2148.9, 2185.6)	2619.9 (2597.4, 2642.4)	1894.7 (1875.3, 1914.2)	1682.4 (1665.3, 1699.4)	1688.0 (1671.7, 1704.2)	1587.1 (1571.4, 1602.7)	1413.2 (1398.5, 1427.8)	1281.2 (1268.0, 1294.3)	1182.1 (1170.4, 1193.8)	1157.3 (1147.0, 1167.7)
60-64	3436.8 (3409.6, 3464.0)	3731.9 (3701.3, 3762.5)	2797.8 (2771.6, 2824.0)	2489.4 (2466.3, 2512.5)	2453.9 (2432.2, 2475.7)	2423.8 (2403.2, 2444.3)	2205.1 (2185.9, 2224.4)	2036.8 (2018.5, 2055.1)	1844.8 (1828.3, 1861.4)	1663.2 (1648.6, 1677.9)
<65[a]	798.2 (795.6, 800.7)	910.4 (907.4, 913.4)	704.0 (701.3, 706.7)	594.5 (592.1, 596.9)	544.7 (542.5, 546.9)	552.9 (550.8, 555.1)	530.8 (528.9, 532.8)	454.0 (452.2, 455.7)	398.5 (396.9, 400.0)	360.6 (359.2, 362.0)

White: Jim Crow polity

	Period									
age	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
<4	592.5 (589.6, 593.3)	499.2 (496.5, 500.0)	410.9 (408.4, 411.7)	319.7 (317.4, 320.4)	263.9 (262.0, 264.6)	223.5 (221.7, 224.1)	185.5 (184.0, 186.1)	160.0 (158.5, 160.5)	153.7 (152.3, 154.2)	144.1 (142.9, 144.5)
5-9	48.3 (47.5, 49.2)	47.1 (46.3, 48.0)	42.9 (42.1, 43.7)	35.5 (34.8, 36.2)	29.5 (28.8, 30.1)	25.5 (24.9, 26.1)	21.2 (20.7, 21.7)	18.7 (18.2, 19.2)	15.9 (15.5, 16.4)	14.1 (13.7, 14.5)
10-14	45.0 (44.2, 45.8)	44.5 (43.7, 45.3)	42.8 (42.1, 43.6)	35.5 (34.8, 36.2)	29.6 (29.0, 30.2)	28.3 (27.7, 29.0)	25.4 (24.8, 26.0)	23.5 (22.9, 24.0)	20.5 (20.0, 21.0)	16.4 (15.9, 16.8)
15-19	101.2 (99.9, 102.5)	117.5 (116.2, 118.9)	110.2 (109.0, 111.4)	106.2 (105.1, 107.3)	102.3 (101.2, 103.5)	89.8 (88.7, 90.9)	86.8 (85.7, 87.9)	78.1 (77.1, 79.1)	75.8 (74.9, 76.8)	77.4 (76.4, 78.3)
20-24	124.3 (122.7, 125.9)	136.3 (134.8, 137.8)	138.3 (136.9, 139.7)	129.7 (128.5, 131.0)	123.2 (122.0, 124.4)	117.1 (115.9, 118.3)	102.6 (101.4, 103.7)	96.9 (95.8, 98.1)	102.3 (101.2, 103.4)	97.0 (95.9, 98)
25-29	119.8 (118.2, 121.4)	124.9 (123.3, 126.5)	127.9 (126.4, 129.3)	117.8 (116.5, 119.0)	116.5 (115.4, 117.7)	110.1 (109.0, 111.2)	110.1 (109.0, 111.3)	97.2 (96.1, 98.3)	98.8 (97.7, 99.9)	107.7 (106.6, 108.8)
30-34	149.4 (147.6, 151.2)	151.2 (149.4, 153.1)	151.1 (149.3, 152.8)	128.4 (127.0, 129.8)	128.1 (126.8, 129.3)	135.0 (133.7, 136.2)	141.4 (140.2, 142.6)	124.3 (123.1, 125.5)	115.2 (114.1, 116.4)	119.9 (118.7, 121.1)
35-39	223.3 (221.1, 225.4)	243.3 (241, 245.7)	218.3 (216.1, 220.5)	189 (187.1, 190.9)	166.0 (164.4, 167.6)	164.3 (162.9, 165.8)	178.5 (177.1, 180.0)	169.4 (168.0, 170.7)	165.6 (164.3, 167.0)	174.3 (172.9, 175.7)
40-44	357.2 (354.4, 360.0)	355.5 (352.7, 358.3)	334.4 (331.7, 337.1)	279.2 (276.8, 281.7)	239.1 (237.0, 241.2)	223.4 (221.5, 225.2)	230.2 (228.5, 232.0)	236.2 (234.6, 237.8)	248.8 (247.2, 250.4)	226.5 (225.0, 228.1)
45-49	543.6 (540.1, 547.2)	588.5 (584.8, 592.1)	550.4 (547.0, 553.8)	497.2 (494, 500.5)	431.4 (428.4, 434.4)	369.4 (366.7, 372.0)	352.8 (350.5, 355.1)	339.6 (337.5, 341.7)	358.5 (356.5, 360.5)	396.3 (394.3, 398.3)
50-54	876.5 (871.7, 881.2)	686.7 (682.6, 690.9)	824.1 (819.8, 828.4)	702.3 (698.4, 706.1)	622.7 (619.1, 626.3)	584.8 (581.3, 588.3)	541.3 (538.1, 544.5)	509.1 (506.4, 511.9)	520.3 (517.7, 522.8)	512.9 (510.5, 515.3)
55-59	1294.4 (1288.2, 1300.6)	1387.6 (1381.4, 1393.8)	1264.9 (1259.2, 1270.5)	1141.3 (1136.2, 1146.3)	1065.5 (1060.8, 1070.2)	971.0 (966.5, 975.6)	898.7 (894.3, 903.0)	822.9 (819.1, 826.8)	774.3 (770.9, 777.6)	796.7 (793.5, 799.8)
60-64	1927.7 (1919.4, 1935.9)	1883.3 (1875.6, 1891.0)	1847.9 (1840.7, 1855.0)	1639.5 (1633.1, 1645.9)	1497.6 (1491.9, 1503.4)	1468.3 (1462.8, 1473.9)	1388.4 (1383.0, 1393.9)	1299.0 (1293.8, 1304.2)	1211.6 (1206.9, 1216.3)	1073.8 (1069.8, 1077.8)
<65[a]	412.8 (411.9, 413.6)	403.0 (402.2, 403.8)	389.3 (388.6, 390.1)	340.2 (339.5, 340.9)	306.3 (305.7, 307)	285.3 (284.7, 285.9)	270.7 (270.2, 271.3)	253.0 (252.5, 253.5)	248.2 (247.8, 248.7)	244.2 (243.7, 244.6)

White: non-Jim Crow polity

	Period									
age	1960-1964	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
<4	537.3 (535.5, 537.8)	484.2 (482.3, 484.7)	358.6 (356.9, 359.1)	296.8 (295.1, 297.3)	246.5 (245.1, 247.0)	213.3 (211.9, 213.7)	173.9 (172.7, 174.3)	142.8 (141.7, 143.1)	133.4 (132.3, 133.7)	124.8 (123.8, 125.1)
5-9	45.1 (44.6, 45.7)	43.9 (43.4, 44.5)	36.0 (35.5, 36.5)	30.4 (29.9, 30.9)	25.8 (25.3, 26.2)	21.7 (21.3, 22.1)	18.2 (17.8, 18.6)	15.3 (15.0, 15.7)	12.9 (12.6, 13.2)	12.0 (11.7, 12.3)

Age										
10-14	39.0 (38.5, 39.6)	39.4 (38.9, 39.9)	35.8 (35.3, 36.3)	30.0 (29.5, 30.4)	25.5 (25.0, 26.0)	23.9 (23.4, 24.4)	21.7 (21.3, 22.1)	19.2 (18.8, 19.6)	16.5 (16.2, 16.9)	13.6 (13.2, 13.9)
15-19	81.5 (80.7, 82.3)	101.0 (100.2, 101.9)	97.2 (96.4, 98.0)	94.7 (93.9, 95.4)	83.1 (82.4, 83.9)	73.5 (72.7, 74.3)	72.1 (71.3, 72.9)	62.4 (61.7, 63.1)	57.0 (56.3, 57.6)	56.1 (55.5, 56.8)
20-24	106.1 (105.1, 107.1)	123.1 (122.1, 124.2)	124.6 (123.6, 125.5)	117.4 (116.5, 118.3)	101.5 (100.7, 102.3)	97.6 (96.7, 98.4)	87.3 (86.4, 88.1)	78.7 (77.9, 79.5)	77.7 (76.9, 78.5)	72.0 (71.2, 72.7)
25-29	103.0 (102.0, 104.0)	113.3 (112.2, 114.3)	110.4 (109.4, 111.4)	107.1 (106.2, 108.0)	101.3 (100.5, 102.1)	102.0 (101.2, 102.9)	100.2 (99.3, 101.0)	82.2 (81.4, 83.1)	78.0 (77.2, 78.8)	81.8 (81.0, 82.6)
30-34	130.9 (129.8, 132.0)	137.3 (136.0, 138.5)	130.6 (129.4, 131.7)	117.1 (116.1, 118.2)	111.3 (110.4, 112.3)	124.1 (123.2, 125.0)	126.9 (126.0, 127.8)	104.7 (103.9, 105.6)	90.8 (89.9, 91.6)	91.2 (90.3, 92.1)
35-39	204.6 (203.3, 205.9)	233.0 (231.5, 234.6)	190.9 (189.4, 192.5)	164.7 (163.3, 166.0)	148.8 (147.6, 150.0)	158.7 (157.6, 159.8)	171.7 (170.6, 172.8)	148.2 (147.2, 149.2)	134.0 (133.0, 135.0)	137.7 (136.7, 138.8)
40-44	334.1 (332.4, 335.8)	338.6 (336.7, 340.4)	292.0 (290.2, 293.8)	243.9 (242.1, 245.6)	214.7 (213.2, 216.3)	214.8 (213.4, 216.2)	219.6 (218.3, 220.9)	204.3 (203.1, 205.5)	199.9 (198.7, 201.0)	175.5 (174.4, 176.7)
45-49	548.1 (545.8, 550.3)	586.7 (584.3, 589.2)	499.3 (496.9, 501.6)	456.4 (454.1, 458.7)	405.1 (402.8, 407.3)	346.0 (344.0, 348.0)	325.5 (323.7, 327.3)	303.4 (301.8, 304.9)	302.8 (301.4, 304.3)	318.0 (316.5, 319.4)
50-54	902.2 (899.2, 905.2)	692.7 (689.9, 695.4)	746.8 (743.9, 749.7)	641.4 (638.8, 644.1)	578.4 (575.7, 581.0)	548.7 (546.0, 551.4)	499.0 (496.5, 501.4)	454.4 (452.2, 456.5)	438.9 (437.1, 440.8)	409.9 (408.2, 411.6)
55-59	1363.1 (1359.2, 1367.0)	1477.6 (1473.4, 1481.9)	1243.2 (1239.2, 1247.1)	1101.6 (1098.0, 1105.2)	1028.9 (1025.4, 1032.4)	932.5 (929.0, 936.0)	833.7 (830.3, 837.1)	750.6 (747.6, 753.7)	688.6 (685.9, 691.3)	673.9 (671.5, 676.3)
60-64	2083.4 (2078.3, 2088.6)	2120.2 (2114.7, 2125.7)	1830.7 (1825.5, 1835.8)	1600.4 (1595.7, 1605.1)	1454.8 (1450.5, 1459.2)	1418.6 (1414.3, 1422.8)	1296.0 (1291.8, 1300.3)	1189.8 (1185.6, 1194.0)	1077.1 (1073.3, 1080.8)	933.7 (930.5, 936.9)
<65[a]	410.9 (410.4, 411.5)	410.0 (409.5, 410.6)	360.7 (360.2, 361.2)	316.7 (316.2, 317.2)	285.4 (284.9, 285.9)	269.3 (268.8, 269.7)	250.3 (249.9, 250.8)	224.9 (224.5, 225.3)	210.4 (210.1, 210.8)	199.3 (198.9, 199.6)

[a] <65 = age-standardized mortality rate for deaths before age 65, standardized to the year 2000 standard million