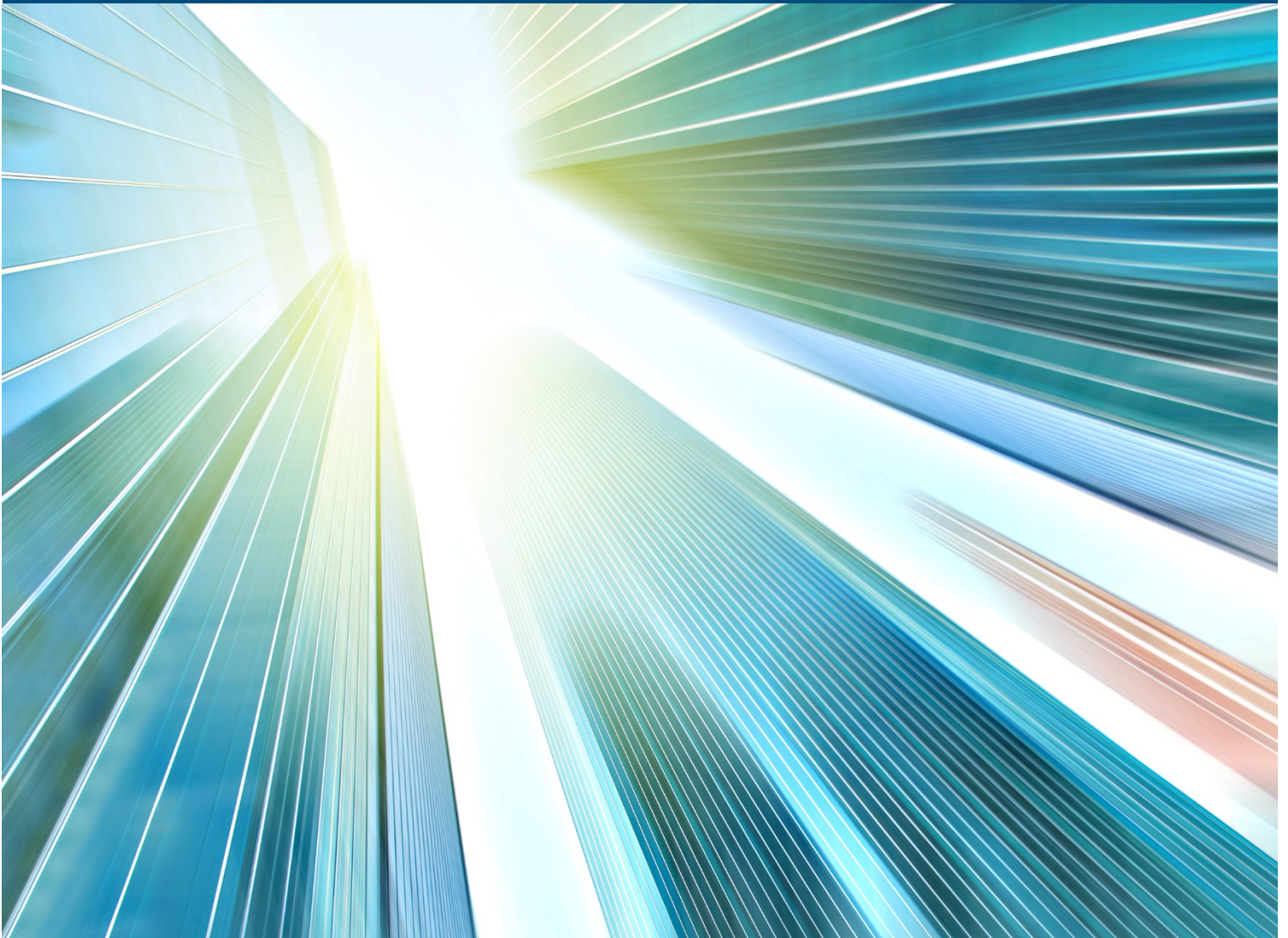


U.S. Population Mortality by Race

July 21, 2020





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Section 1: Introduction

The Society of Actuaries has launched an initiative to dedicate a portion of its ongoing research to exploring issues unique to communities of color in America. This report covers historical mortality from 1999-2018 by race as categorized by population data from the Centers for Disease Control and Prevention’s (CDC) WONDER¹ database (Wide-ranging Online Data for Epidemiologic Research). Additionally, in 2020, the COVID-19 pandemic has influenced mortality as a whole and this report shows how the Black population are disproportionately affected.

Historical mortality over 1999-2018 for all deaths and six specific causes of death are considered. Deaths in 2020 are based on provisional COVID-19 deaths published by the CDC².

Table 1 shows the causes of death included in this report and their International Classification of Diseases, Tenth Revision³ (ICD-10) 113 Code, Cause List, and ICD-10 codes as they appear in WONDER.

Table 1
REPORTED CAUSE OF DEATH

Report Cause of Death	ICD-10 113 Code	ICD-10 113 Cause List (with ICD-10 codes)
Cancer	GR113-019	#Malignant neoplasms (C00-C97)
Diabetes	GR113-046	#Diabetes mellitus (E10-E14)
Flu & Pneumonia	GR113-076	#Influenza and pneumonia (J09-J18)
Heart Disease	GR113-054	#Diseases of heart (I00-I09,I11,I13,I20-I51)
Pulmonary Disease	GR113-082	#Chronic lower respiratory diseases (J40-J47)
Stroke	GR113-070	#Cerebrovascular diseases (I60-I69)

For 1999-2018, the actual population data was used for determining rates of death per 100,000 population. For 2020 COVID-19 death, the 2018 population was used. The population estimates are U.S. Census Bureau estimates of U.S. national, state, and county resident populations as obtained from the WONDER database.

The analysis in this report is shown by the five race groups defined and reported by the CDC. Table 2 shows the five different race groups and how they are referred to in the report.

Table 2
REPORTED RACE GROUPS

Report Race Group	Full Race Group Name
Asian	Non-Hispanic Asian or Pacific Islander
Black	Non-Hispanic Black or African American
Hispanic	Hispanic or Latino
Native American	Non-Hispanic American Indian or Alaska Native
White	Non-Hispanic white

¹ <https://wonder.cdc.gov/>

² <https://www.cdc.gov/nchs/nvss/vsrr/COVID19/index.htm>

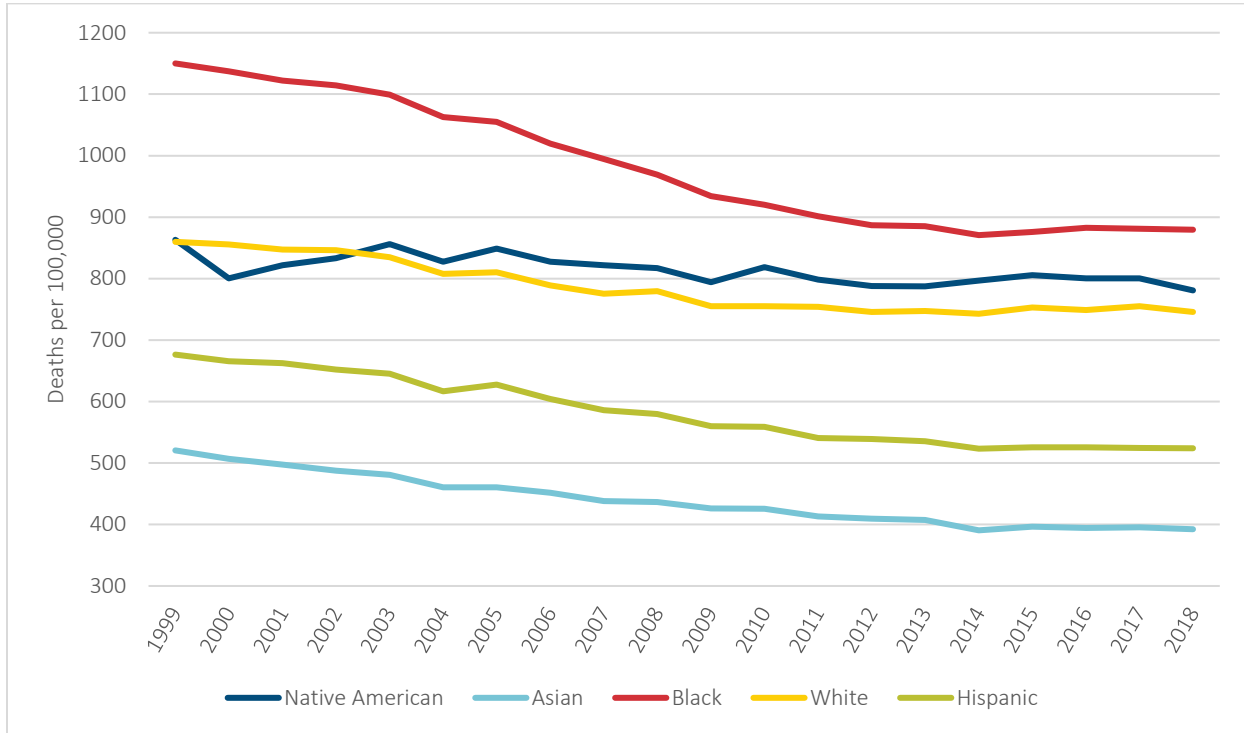
³ World Health Organization <https://icd.who.int/browse10/2016/en>

Section 2: Mortality by All Causes of Death by Race

Figure 1 shows the annual age-adjusted death rate per 100,000 lives for all causes of death for years 1999-2018.

Figure 1

AGE-ADJUSTED MORTALITY 1999-2018 - ALL CAUSES OF DEATH BY RACE



The Black population had the highest annual age-adjusted rate of mortality in all years from 1999-2018 versus all other races. While all races showed positive annual mortality improvement (decreasing mortality) over the period, the Asian population had the highest at 1.48%, followed by the Black population at 1.40%. In 2018, the Black population had an age-adjusted rate 1.13 times higher than the Native American population, 1.18 times higher than the white population, and 1.68 times higher than the Hispanic population.

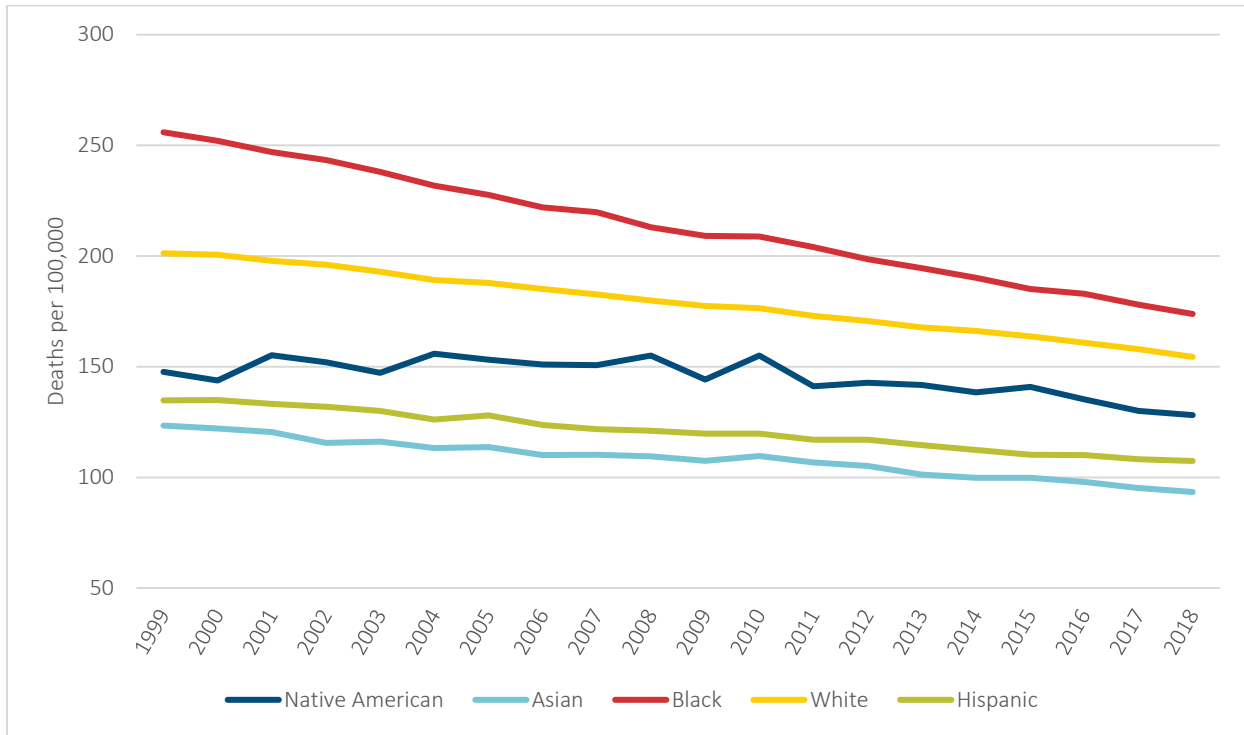
The Asian and Hispanic populations had the lowest annual age-adjusted rate of mortality in all years from 1999-2018. The Hispanic Population had the third highest annual mortality improvement of 1.33%. In 2018, the mortality rate ratio of the Asian population to the Black population was 0.45 and the ratio of the Black population to the Hispanic population was 0.60.

The white and Native American populations had an annual age-adjusted mortality rate that was in the middle in all years. Additionally, the rates were very similar between the two races with the rates differing between plus and minus 8% each year. The white population had the second to lowest positive annual mortality improvement of 0.75% over 1999-2018, followed by the Native American population at 0.53%.

Section 3: Mortality by Cancer by Race

Figure 2 shows the annual age-adjusted death rate per 100,000 lives for cancer deaths for years 1999-2018.

Figure 2
AGE-ADJUSTED MORTALITY 1999-2018 - CANCER BY RACE



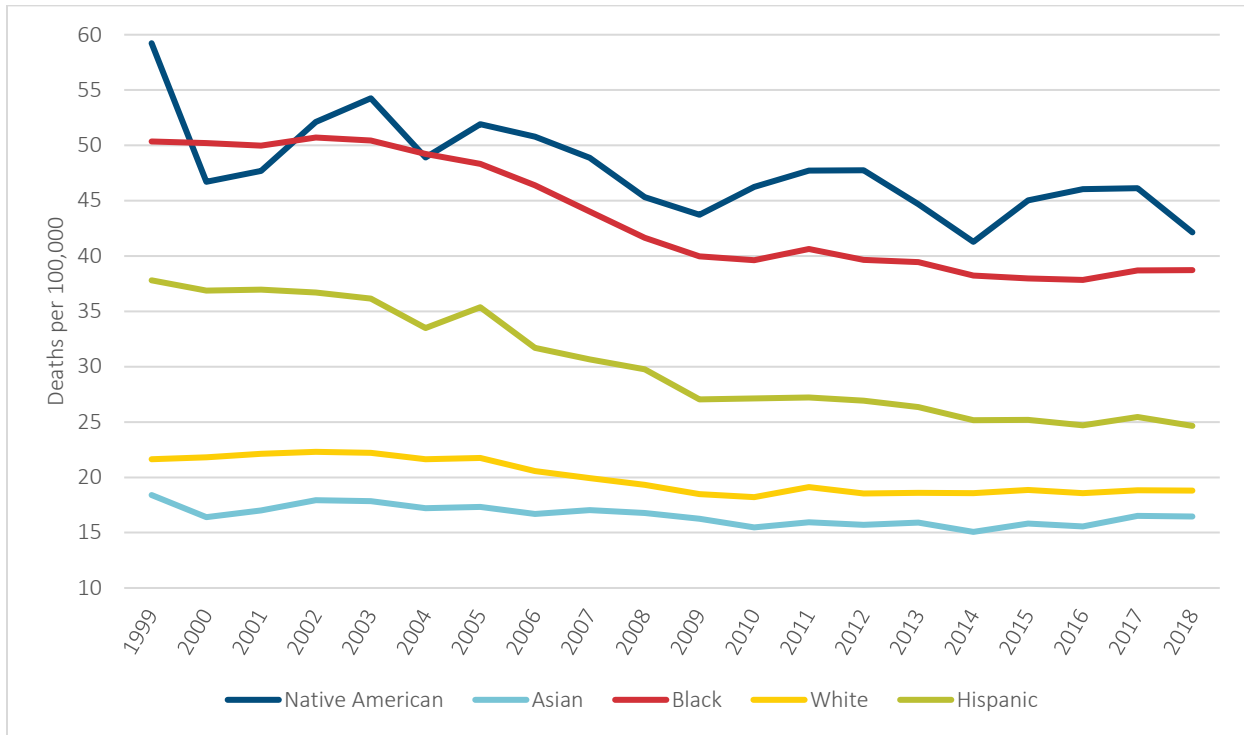
For deaths by cancer, the Black population had the highest annual age-adjusted rate of mortality in all years from 1999-2018 versus all other races. This was followed by the white, Native American, Hispanic, and Asian populations. The average ratio in all years between the first four (Black to white, white to Native American, and Native American to Hispanic) were consistent, 1.19, 1.23, and 1.20, respectively. The Hispanic and Asian populations had a smaller ratio over that period of 1.12.

Over the period, all races showed positive annual mortality improvement. The Black population had the highest at 2.02%. This was followed by the Asian, white, Hispanic, and Native American populations at 1.46%, 1.38%, 1.19%, and 0.74%, respectively. The Black population also has the highest annual mortality improvement over the last five years (2.22%) and for 2018 (2.37%).

Section 4: Mortality by Diabetes by Race

Figure 3 shows the annual age-adjusted death rate per 100,000 lives for diabetes deaths for years 1999-2018.

Figure 3
AGE-ADJUSTED MORTALITY 1999-2018 - DIABETES BY RACE



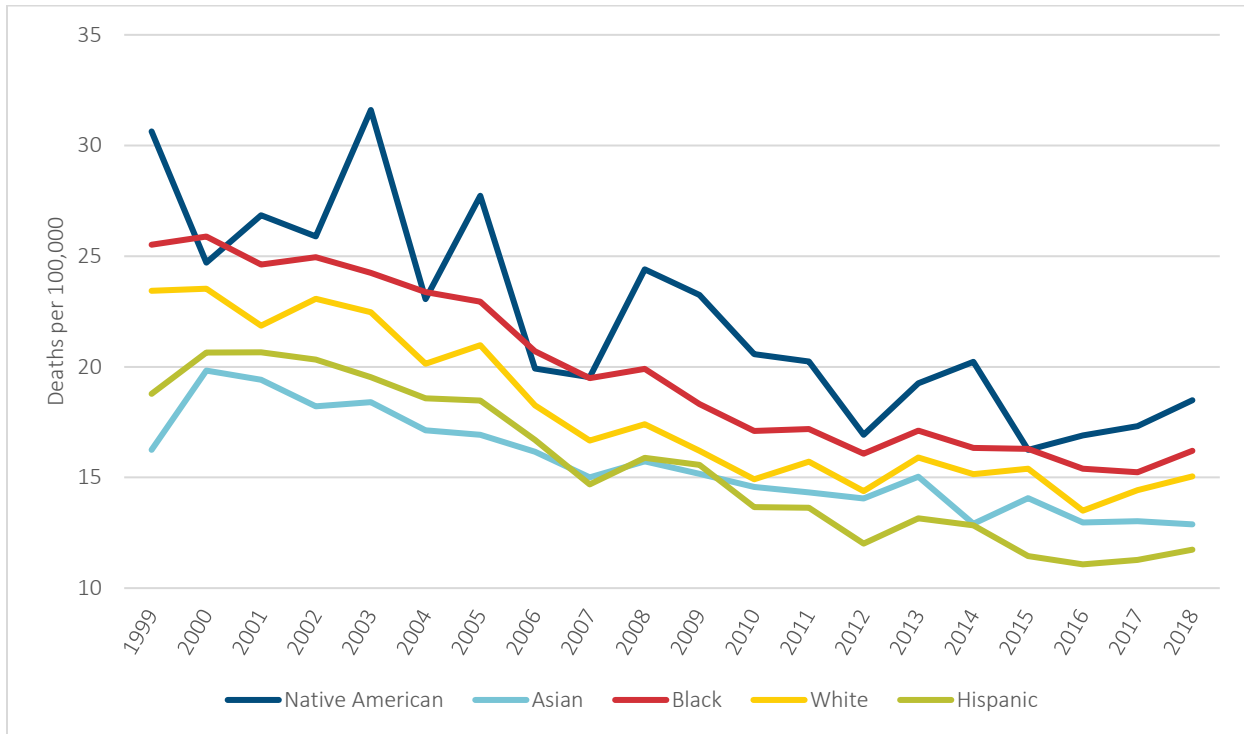
For deaths by diabetes, the Native American and Black populations had the highest annual age-adjusted rate of mortality in all years from 1999-2018 versus all other races. The two races are close to each other, with the Native American population greater in all years from 2005-2018. The average ratio between the two in all years was 1.10. The Hispanic population had the next largest annual age-adjusted rate over 1999-2018. The average ratio between the Black and Hispanic populations was 1.45. Following the Hispanic population were the white and Asian populations, respectively. The average ratio between the Hispanic and white populations was 1.51 and between white and Asian was 1.21.

Over the period, all races showed positive annual mortality improvement. The Hispanic population had the greatest improvement at 2.23%. This was followed by the Native American, Black, white, and Asian populations at 1.78%, 1.37%, 0.74%, and 0.58%, respectively. The Hispanic population also had the highest annual mortality improvement over the last five years (1.32%) and second highest for 2018 (3.18%). In 2018, the Native American population showed a large annual mortality improvement of 8.65%. Such large changes are typical for the Native American population as 11 of the 19 years had shown at least a plus or minus 4% change.

Section 5: Mortality by Flu & Pneumonia by Race

Figure 4 shows the annual age-adjusted death rate per 100,000 lives for flu & pneumonia deaths for years 1999-2018.

Figure 4
AGE-ADJUSTED MORTALITY 1999-2018 - FLU & PNEUMONIA BY RACE



For deaths by flu & pneumonia, in 2018, the Native American population had the highest annual age-adjusted rate of mortality. This was followed by the Black, white, Asian, and Hispanic populations. From the years 2010-2018, this same pattern held (except in 2015 where the Black population pulled slightly above the Native American population). Over this period, the ratios between Native American to Black, Black to white, white to Asian, and Asian to Hispanic were 1.13, 1.09, 1.09, and 1.12, respectively. In 2018, these ratios were 1.14, 1.08, 1.17, and 1.10, respectively.

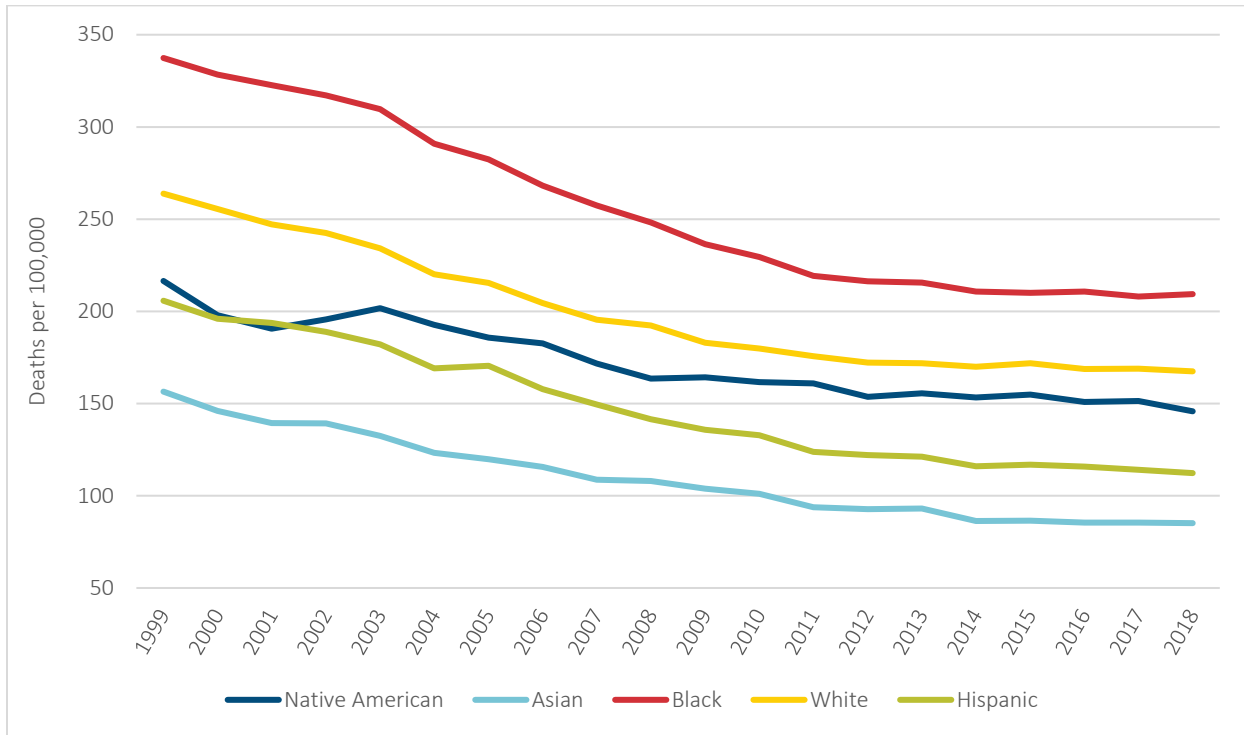
Over the period, all races showed positive annual mortality improvement. The Native American population had the highest at 2.62%. This was followed by the Hispanic, Black, white, and Asian populations with 2.44%, 2.36%, 2.31%, and 1.22%, respectively. The Asian population had the highest annual mortality improvement over the last five years at 3.05%.

In 2018, all races except for the Asian population had a mortality rate increase. The Asian population had an annual mortality rate improvement of 1.11% where the Native American, Black, Hispanic, and white populations were at -6.77%, -6.40%, -4.16%, and -4.26%, respectively.

Section 6: Mortality by Heart Disease by Race

Figure 5 shows the annual age-adjusted death rate per 100,000 lives for heart disease deaths for years 1999-2018.

Figure 5
AGE-ADJUSTED MORTALITY 1999-2018 - HEART DISEASE BY RACE



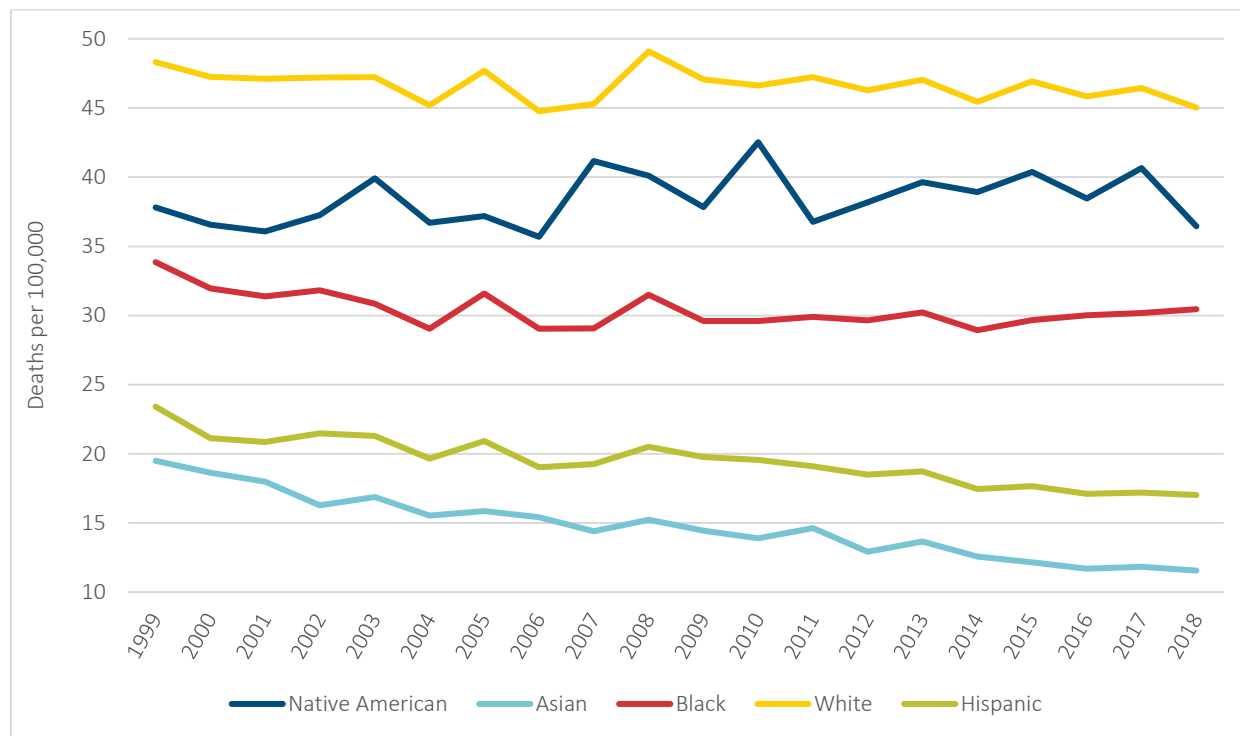
For deaths by heart disease, the Black population had the highest annual age-adjusted rate of mortality in all years from 1999-2018 versus all other races. This was followed by the white, Native American, Hispanic, and Asian populations. The average ratio between the Black and white populations was 1.28 over the period. Between white to Native American and Native American to Hispanic populations, the average ratios were much more similar, 1.15 and 1.19. Hispanic to Asian populations had an average ratio of 1.34.

Over the period, all races showed positive annual mortality improvement. The Asian and Hispanic populations had the highest at 3.15% and 3.14%, respectively. This was followed by the Black, white, and Native American populations with 2.48%, 2.36%, and 2.06%, respectively. The Asian population had the highest annual mortality improvement over the last five years at 1.78% and the Native American population had the highest annual mortality improvement in 2018 at 3.71%. In 2018, the Black population was the only race group to have had an annual mortality rate increase with an annual mortality improvement of -0.60%.

Section 7: Mortality by Pulmonary Disease by Race

Figure 6 shows the annual age-adjusted death rate per 100,000 lives for pulmonary disease deaths for years 1999-2018.

Figure 6
AGE-ADJUSTED MORTALITY 1999-2018 - PULMONARY DISEASE BY RACE



For deaths by pulmonary disease, the white population had the highest annual age-adjusted rate of mortality in all years from 1999-2018 versus all other races. This was followed by the Native American, Black, Hispanic, and Asian populations. The average ratio between each race was consistent, except for that of the Black and Hispanic populations. Between the Black and Hispanic populations, the average ratio was 1.57 over the period. For the others in order: white to Native American (1.22), Native American to Black (1.27), and Hispanic to Asian (1.33).

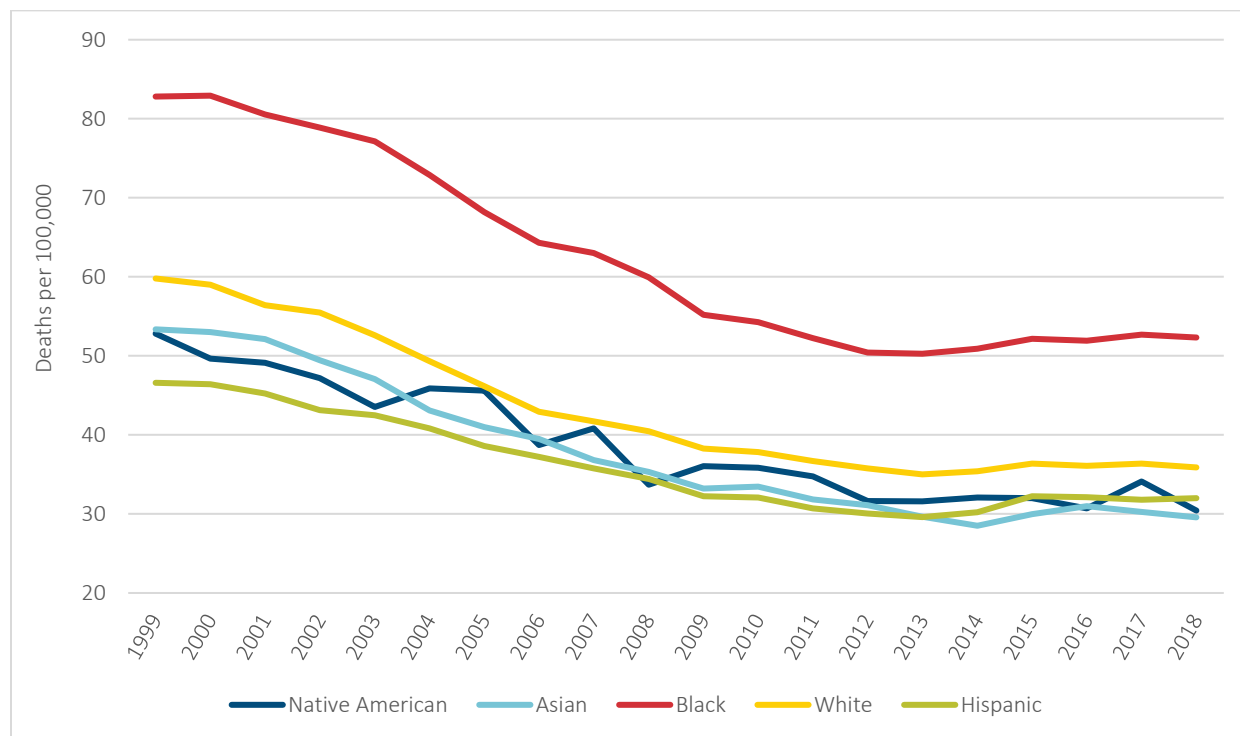
Over the period, all races showed positive annual mortality improvement. The Asian population had the highest at 2.71%. This was followed by the Hispanic, Black, white, and Native American populations with 1.66%, 0.55%, 0.37%, and 0.20%, respectively. Over the last five years, the Asian population had the greatest annual mortality improvement at 3.29%. In 2018, the Native American population had the greatest annual mortality improvement of 10.37%. During the last five years, the Black population mortality rate improvement factor was -0.16%, indicating a mortality rate increase.

In 2018, the Black population was the only race group to have had a mortality rate increase with an annual mortality improvement of -0.93%. Furthermore, during the last 10 years, the Black population has consistently shown worse rates of mortality improvement, with six of the last 10 year-over-year trend measurements indicating a mortality rate increase.

Section 8: Mortality by Stroke by Race

Figure 7 shows the annual age-adjusted death rate per 100,000 lives for stroke deaths for years 1999-2018.

Figure 7
AGE-ADJUSTED MORTALITY 1999-2018 - STROKE BY RACE



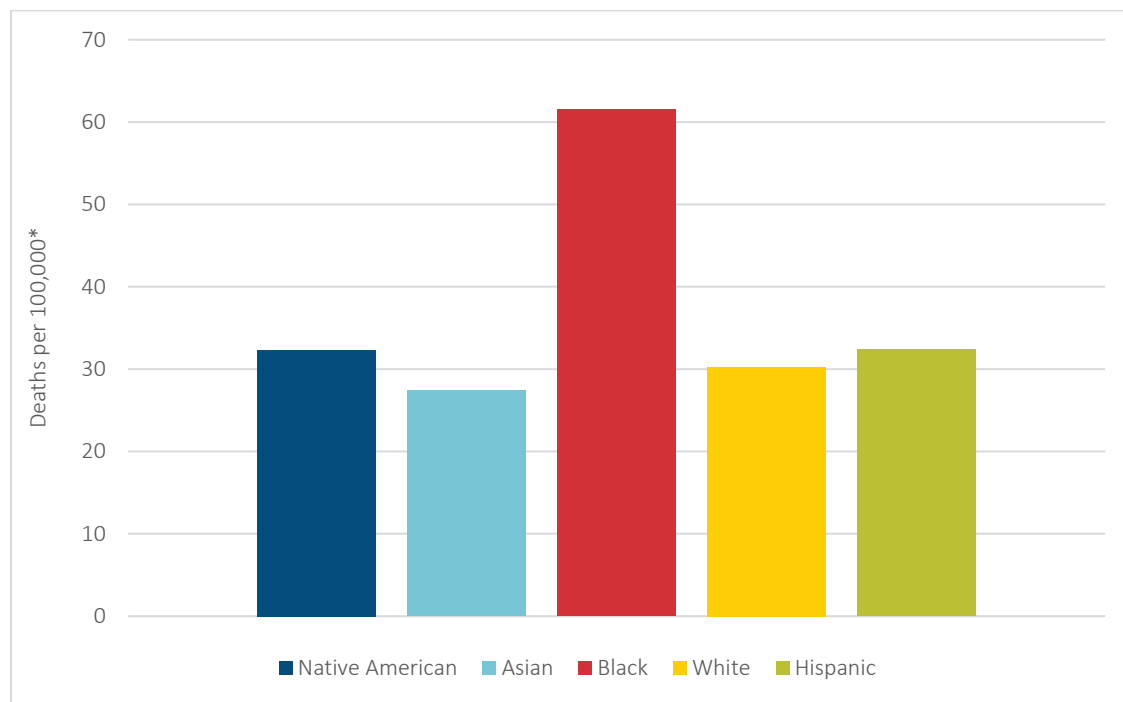
For deaths by stroke, the Black population had the highest annual age-adjusted rate of mortality in all years from 1999-2018 versus all other races. The white population had the next highest annual age-adjusted rate of mortality in all years and had an average ratio of 1.45 over the period between Black and white. The Asian, Native American, and Hispanic populations had the lowest age-adjusted rate of mortality over the period. The annual age-adjusted mortality rates for these three populations are close during the period. In looking at the individual year-by-year rates, each of these three populations has, at one time, been the highest or lowest over the period.

Over the period, all races showed positive annual mortality improvement. The Asian population had the highest at 3.06%. This was followed by the Native American, white, Black, and Hispanic populations with 2.86%, 2.65%, 2.39%, and 1.96%, respectively. Over the last five years, only the Native American and Asian populations had positive annual mortality improvement at 0.74% and 0.04%, respectively. The Hispanic, Black, and white populations all had a mortality increase over the past five years with annual mortality improvement at -1.58%, -0.80%, and -0.49%, respectively. In 2018, all races except for the Hispanic population had an annual mortality improvement where they were at -0.70%.

Section 9: 2020 COVID-19 Mortality by Race

Figure 8 shows crude death rates per 100,000 in 2020 from COVID-19 broken down by race as of July 1, 2020.

Figure 8
2020 COVID-19 MORTALITY PER 100,000 OF POPULATION BY RACE



*Population data is year 2018 from WONDER.

As of July 8, 2020, there have been 112,226 COVID-19 deaths as shown in Table 3.

Table 3
2020 COVID-19 DEATHS BY RACE

Race	COVID-19 Deaths	% of Deaths	2018 Population	% of Total Population	Rate per 100,000
Non-Hispanic white	60,862	53%	201,068,278	61%	30.3
Non-Hispanic Black or African American	26,426	23%	42,934,826	13%	61.5
Hispanic or Latino	19,409	17%	59,871,746	18%	32.4
Non-Hispanic Asian	5,629	5%	20,546,745	6%	27.4
Non-Hispanic American Indian or Alaska Native	888	1%	2,745,839	1%	32.3
Other	1,527	1%			
Total	114,741	100%	327,167,434	100%	35.1

Data source: <https://data.cdc.gov/NCHS/Provisional-Death-Counts-for-Coronavirus-Disease-C/pj7m-y5uh> (as of July 1, 2020)

The white population made up just over half the COVID-19 deaths year to date at 53%. This was followed by the Black and Hispanic populations at 23% and 17%, respectively. However, when looking at populations, the percentages are much different where the white, Black, and Hispanic populations made up 61%, 13%, and 18%, respectively, of the 2018 total population.

When looking at rates per 100,000 population, the death rate due to COVID-19 disproportionately affects the Black population. While the ratio between the Hispanic to white populations rate was 1.07, the ratio of the Black to white populations rate was 2.03 and Black to Hispanic, 1.90. When excluding the Black population, the overall rate is 31.1 and the ratio of the Black population to the combined rate of the four other race groups was 1.98.

About The Society of Actuaries

With roots dating back to 1889, the *Society of Actuaries* (SOA) is the world's largest actuarial professional organizations with more than 31,000 members. Through research and education, the SOA's mission is to advance actuarial knowledge and to enhance the ability of actuaries to provide expert advice and relevant solutions for financial, business and societal challenges. The SOA's vision is for actuaries to be the leading professionals in the measurement and management of risk.

The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement and other topics. The SOA's research is intended to aid the work of policymakers and regulators and follow certain core principles:

Objectivity: The SOA's research informs and provides analysis that can be relied upon by other individuals or organizations involved in public policy discussions. The SOA does not take advocacy positions or lobby specific policy proposals.

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