Trends in Cause-Specific Mortality by Race and Hispanic Origin, 1999–2019

by Javier Meseguer*

Differences in mortality rates by race and ethnicity (RE) affect the distribution of outcomes of Social Security program participants. This article summarizes and compares recent trends in cause-specific mortality by sex and age among four major RE groups in the U.S. population. Causes of death are examined both at the level of broad categories, such as neoplasms, and of specific subcategories, such as lung cancers. From 1999 to 2019, all-cause age-adjusted mortality rates declined significantly, particularly during the first half of the period. Although those rates declined for all four RE groups, improvement among the non-Hispanic White population lagged that of the other groups, which narrowed preexisting mortality differentials, especially that between the Black and non-Hispanic White populations. However, gaps remained. Additionally, "deaths of despair," such as those caused by drug and alcohol abuse and suicide, increased for most groups in the second half of the period.

Introduction

Assessing outcomes for Social Security retirement and disability program participants involves accounting for beneficiary mortality patterns, and studies of mortality have examined death rate variations by socioeconomic status (SES), earnings, and educational attainment far more than by race and ethnicity (RE). For instance, it is well established that mortality declines as a function of higher SES and that gains in longevity over time disproportionately accrue to those with higher earnings and educational attainment (Bor, Cohen, and Galea 2017). As a result, with all else equal, an "across the board" Social Security policy change such as an increase in the normal retirement age represents a disproportionately large benefit reduction for retired beneficiaries with lower lifetime earnings, whose life expectancies tend to be shorter than those of workers with higher earnings histories. In a similar fashion, understanding mortality differentials over time by race, ethnicity, and sex can shed light on the distributional effects of current and future retirement and disability program policies. This article summarizes and compares recent trends (1999–2019) in cause-specific mortality in the United States by RE group, sex, and age.

For this study, population and death counts by cause of death were obtained from the Centers for Disease Control and Prevention Wide-Ranging Online Data for Epidemiological Research (CDC WONDER) database, which provides underlying cause-of-death data using codes defined in the World Health Organization's International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10).[1] I selected the 1999–2019 time frame deliberately to avoid mortality data beyond 2019. Doing so sidesteps the COVID-19 pandemic's distortion of historic trends.[2] Another reason to avoid the most recent year available in the data is that Census Bureau population estimates can change from year to year (particularly

Selected Abbreviations

AIAN	American Indian or Alaska Native
API	Asian or Pacific Islander
CDC	Centers for Disease Control and Prevention
COPD	chronic obstructive pulmonary disease
HIV	human immunodeficiency virus

* *Javier Meseguer is with the Office of Research in the Office of Research, Evaluation, and Statistics, Office of Retirement and Disability Policy, Social Security Administration.*

Selected Abbreviations—*Continued*

ICD	International Statistical Classification of Diseases and Related Health Problems
NCHS	National Center for Health Statistics
RE	race and ethnicity
WNH	White, non-Hispanic
WONDER	Wide-Ranging Online Data for Epidemiological Research

for older individuals), so that the estimated mortality rates for 2020 and later may be revised in future updates. Likewise, extending the data set to years before 1999 would require reconciling different ICD classification schemes, which lies beyond my expertise and the scope of this article.[3]

A crude death rate is simply the ratio of the number of deaths to the population count for a given group at a specific point in time. Comparing crude death rates across groups or time periods can be deceiving because the age distributions of population groups can change in divergent ways over time. Age-adjusting the death rates by holding the age distribution constant overcomes the effects of those changes and allows a meaningful comparison of mortality rates between males and females, between people of different races or ethnicities, or across different time periods for members of a single group. All mortality rates discussed in this article are age-adjusted and are expressed as deaths per 100,000 population. For consistency with the CDC WONDER database's default option, I use the direct method of computing age-adjusted death rates, based on the CDC definition of the 2000 U.S. standard population.[4]

There are inherent limitations to the quality of cause-specific mortality data, particularly when disaggregated by race and Hispanic origin. The population data in the denominator of a crude mortality rate and the death count data in the numerator derive from different sources. Specifically: All population counts used in this article are bridged-race estimates of the July 1st resident population from the Census Bureau, in which the RE data are self-reported.[5] By contrast, the death counts come from death certificates filed in the states and compiled into a national database by the CDC's National Center for Health Statistics (NCHS). Any information on race or ethnicity in a death certificate is either based on direct observation by the funeral director or reported by the surviving next of kin or other informant. As a result, there can be discrepancies between the decedent's self-identified RE group and the judgment of an outside observer.

Comparing the NCHS database with the Census Bureau's National Longitudinal Mortality Study, Arias and others (2008) found that the quality of death certificate data is excellent for the White and Black populations, reasonably good for the Hispanic and Asian or Pacific Islander (API) populations, and very poor for the American Indian or Alaska Native (AIAN) population. For example, for the 1990–1998 period, the percentage of respondents in a self-identified RE group who were correctly identified on the death certificate was only 55.2 percent among the AIAN community, but it was 88.1 percent for the Hispanic population, 89.7 percent for the API population, 98.1 percent for Black individuals, and 99.6 percent among the White population. Adjustment for death certificate misclassification had minimal effect on the mortality estimates associated with the API and Hispanic communities, but led to a reversal of the mortality differentials between the White and AIAN populations. Moreover, the authors found that the geographic distribution of the populations affected the misclassification rate. For AIAN, API, and Hispanic individuals, residence in areas with a high coethnic concentration improved the quality of the RE classification on the death certificate. Nativity was also an important factor, with the foreign-born Hispanic population considerably more likely to be correctly classified than the U.S.-born group. The quality of the death certificate data was better for people of Mexican, Puerto Rican, and Cuban origin than for those of Central American, South American, or other Hispanic heritage. Thus, although death rate estimates for the entire Hispanic population are reliable, accurately estimating mortality rates for specific Hispanic subgroups could be problematic.

Also complicating the RE classifications in the underlying data is the fact that as the U.S. population has become more diverse, Americans' perceptions on race have evolved. In 2000 and 2010, census respondents identifying as "some other race"—an option that has been part of the questionnaire for more than 100 years in one form or another and was always meant to be a minor residual category—became instead the third largest race group (Ashok 2016). Those identifying as some other race were mostly Hispanic individuals, as well as members of Afro-Caribbean, Middle Eastern, and North African populations who did not identify with any of the Office of Management and Budget's official race categories. The increasing share of ethnoracially mixed families over

time suggests further challenges to the collection of RE data that can accurately illustrate trends, as increasing numbers of Americans with multiple backgrounds will decide how to define their own identity. The public's evolving perception of RE identification calls for more detailed and disaggregated data. The Census Bureau has undertaken a number of research projects aimed at improving RE question design and data quality, such as the 2010 Census Alternative Questionnaire Experiment and the 2015 National Content Test (Census Bureau 2022), but the challenge is ongoing.

A notable limitation of the cause-specific mortality data is the fact that one or more comorbidities may accompany a reported cause of death, raising potential uncertainty about the primary underlying cause. Typically, a funeral home director records the demographic information in a death certificate; but physicians, medical examiners, or coroners report cause of death using the current ICD standards. For its statistical tabulations, NCHS applies an automated coding system that can overrule the actual cause of death reported by a certifier, in an effort to standardize and improve the quality of the data.[6] Nevertheless, death certificate information can be incomplete or certifiers may be poorly trained, leading to ambiguities. For example, based on a sample from the University of Michigan's Health and Retirement Study of noninstitutionalized U.S. adults, Stokes and others (2020) found that the death certificates underestimated the burden of dementia on mortality by a factor of 2.7.

For this article, I analyze mortality among four RE categories: (1) White, non-Hispanic (WNH); (2) Hispanic (of any race); (3) Black, regardless of Hispanic origin; and (4) API, regardless of Hispanic origin.[7] The analysis explicitly excludes a separate AIAN category because it represents a relatively small sample in the CDC WONDER database (4.8 million people in 2019) and Arias and others (2008) documented a high misclassification rate in their death certificates. However, AIAN individuals of Hispanic origin are included in the Hispanic population group. Notice that the Black, Hispanic, and API categories are not mutually exclusive, as this would require arbitrarily suppressing one of two overlapping identity groups. Thus, for instance, an individual who identifies as both Black and Hispanic is included in both categories.[8] Nevertheless, the amount of overlap is small. For example, the full population count in 2019 was 328.3 million people, while the sum of the four RE categories was 329.9 million. The difference (1.6 million people) represents individuals overlapping the Hispanic, Black, and API population groups, minus AIAN individuals of non-Hispanic origin. It amounts to one-half of 1 percent of the full population count.

Finally, this analysis is descriptive, in that there is no attempt to fit the computed age-adjusted mortality series to any formal statistical model. By contrast, in Woolf and Schoomaker (2019), for example, the authors fit a series of joint-point regression models to ascertain statistically whether a mortality series rose or declined over a particular period (which itself involves a number of assumptions and reliance on a modification of the Bayesian information criterion). This article reports rising or declining mortality simply as the difference in magnitudes between the beginning and end of the period observed.

The article comprises this introduction and 15 additional sections, arranged as follows:

- A section that describes features of the four RE groups whose counts enter the denominator of crude death rates, highlighting distributional differences in their age structures and the effects of immigration. It also addresses variation in the geographic distribution of the various population groups.
- A section that provides an overview of cause-specific age-adjusted mortality, based on cause-of-death categories corresponding to 17 ICD-10 chapters.
- A section that describes variation in all-cause mortality by state, county, and RE group.
- Individual sections discussing mortality for 10 cause-of-death categories. Each section explores mortality patterns for the specific subcategories that constitute those categories:
  - —Diseases of the circulatory system.
  - —Neoplasms (cancers).
  - —Diseases of the respiratory system.
  - —External causes of mortality, such as transportation accidents, assaults, falls, poisonings (including drug and alcohol overdoses), and self-inflicted harm (suicide).
  - —Diseases of the nervous system, including Alzheimer's, Parkinson's, and other degenerative diseases.
  - —Endocrine, nutritional, and metabolic diseases, such as diabetes and obesity.
  - —Mental and behavioral disorders, including dementia and psychoactive substance use.
  - —Diseases of the digestive system.

—Diseases of the genitourinary system, such as renal failure.

—Infectious and parasitic diseases, including human immunodeficiency virus (HIV), hepatitis, and sepsis.

- A brief section presenting summary statistics for other less frequent cause-of-death categories.
- A concluding section, with a summary of findings.

U.S. Population by RE Group

The size and composition of the U.S. population by RE group is determined by the differences in birth and mortality rates among the various groups, as well as their levels of net migration. The foreign-born U.S. population reached 44.8 million in 2018, representing 13.7 percent of the total population. Both the age structure and geographic origins of the U.S. immigrant population have changed dramatically since 1960, when 84 percent of U.S. immigrants were born in Europe or Canada. Today, more than three-quarters of U.S. immigrants come from Latin America or Asia and tend to be younger than previous immigrant waves. Since about 2010, newly arrived API immigrants have outnumbered those of Hispanic origin, as immigration from Latin America began a sharp decline during the Great Recession. People of API origin are projected to be the largest immigrant group by the middle of the century (Budiman and others 2020; Budiman 2020).[9] Foreign-born individuals constitute about 10 percent of the Black population (Tamir 2022), 32 percent of the Hispanic population (Moslimani and Noe-Bustamante 2023), and 57 percent of the Asian population (Budiman and Ruiz 2021) in the United States. Further, a disproportionate share of U.S. births are to immigrant women, although the birth rate has declined for both the native- and foreign-born U.S. populations (Livingston 2019). More than three-quarters of immigrants are in the country legally and the percentage of immigrants who are naturalized U.S. citizens stood at 45 percent in 2017 (Budiman 2020).

Table 1 provides population counts for 1999 and 2019 by RE group, overall and in three broad age categories (0–24, 25–64, and 65 or older).[10] For the same years, Chart 1 shows the U.S. population by RE group and single year of age from 0 to 84. Panels A and B show the population counts and Panels C and D show the percentage distributions by RE group. The WNH share of the population has declined over time, particularly at younger ages. From 1999 to 2019, the WNH population increased by about 3.8 million (Table 1). By contrast, the Hispanic, Black, and API populations rose by 26.6 million, 10.4 million, and 10.5 million, respectively. In 1999, the WNH community constituted 70.8 percent of the U.S. population. The API community accounted for 4.1 percent of the population, while Black people (13.0 percent of the population) represented a slightly larger group than those of Hispanic origin (12.2 percent). By 2019, the WNH share of the population had declined to 60.9 percent, while the API, Black, and Hispanic shares of the population respectively expanded to 6.6 percent, 14.1 percent, and 18.4 percent, making the Hispanic community the second largest RE group.

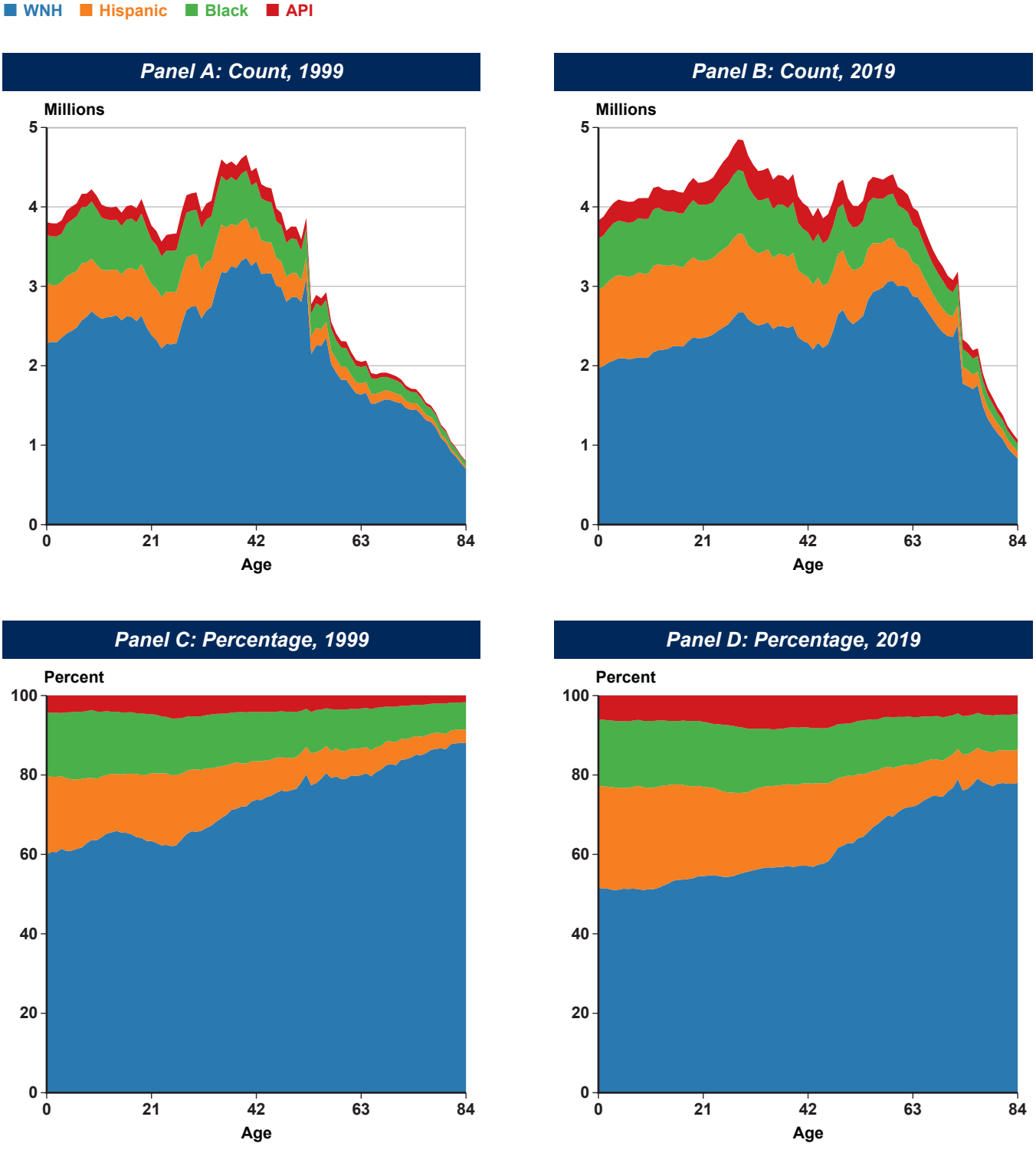
Chart 2 shows the population counts in 1999 and 2019 by age and sex for each RE group. The age structure varied substantially among the RE groups

Table 1.
U.S. population, by RE group and age group, 1999 and 2019

Age group	WNH	Hispanic	Black	API
		1999		
All	197,154,118	33,937,795	36,173,121	11,346,496
0–24	62,218,228	16,434,164	15,669,465	4,253,527
25–64	105,547,575	15,844,820	17,639,711	6,269,718
65 or older	29,388,315	1,658,811	2,863,945	823,251
		2019		
All	200,905,474	60,572,237	46,599,393	21,814,724
0–24	54,825,796	25,546,387	17,213,908	6,716,442
25–64	104,685,120	30,386,884	24,127,432	12,405,969
65 or older	41,394,558	4,638,966	5,258,053	2,692,313

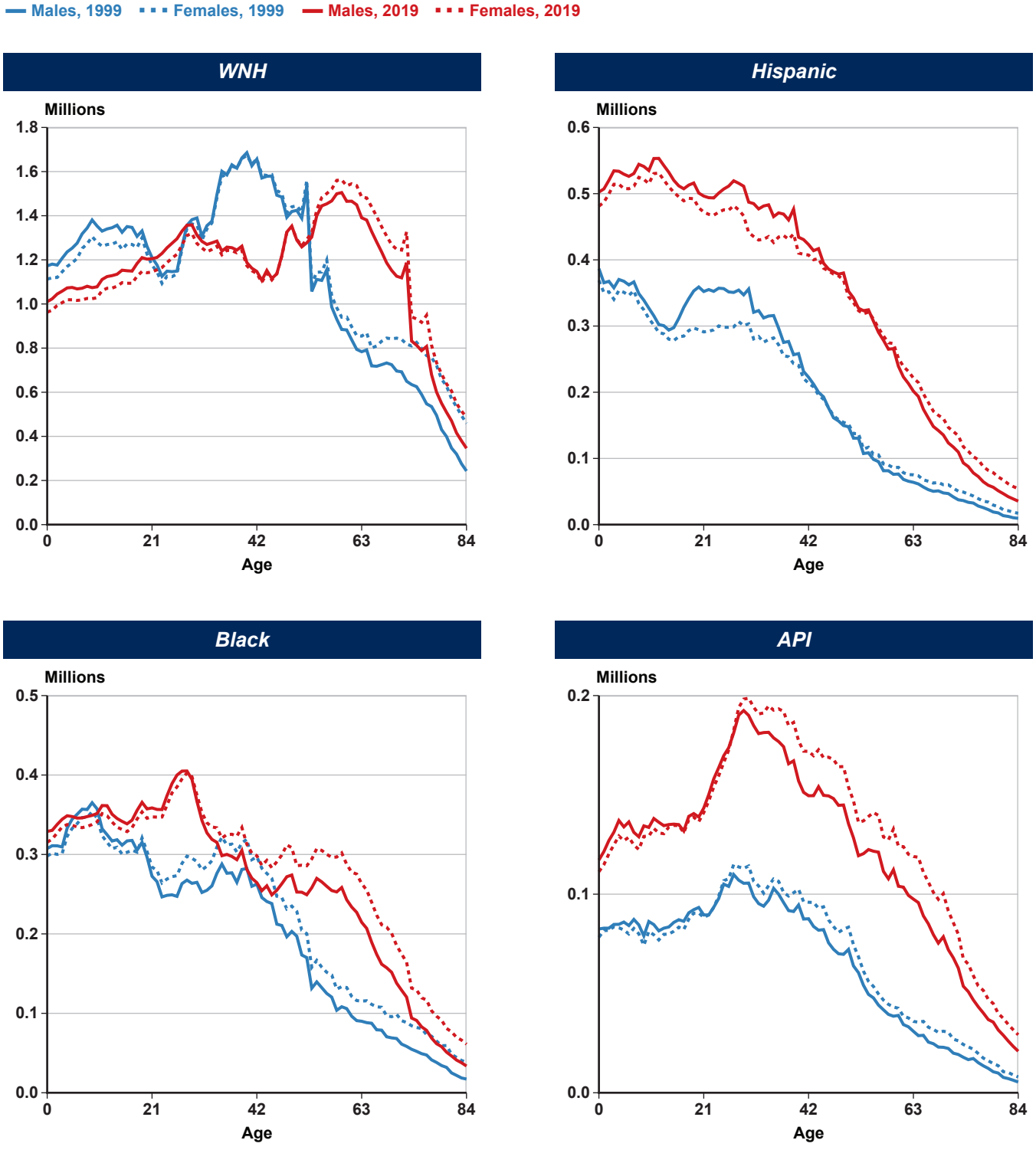
SOURCE: Author's calculations based on CDC WONDER.

Chart 1.
Count and percentage distribution of the U.S. population, by RE group and age, 1999 and 2019



SOURCE: Author's calculations based on CDC WONDER.

Chart 2.
Population count by RE group, sex, and age, 1999 and 2019



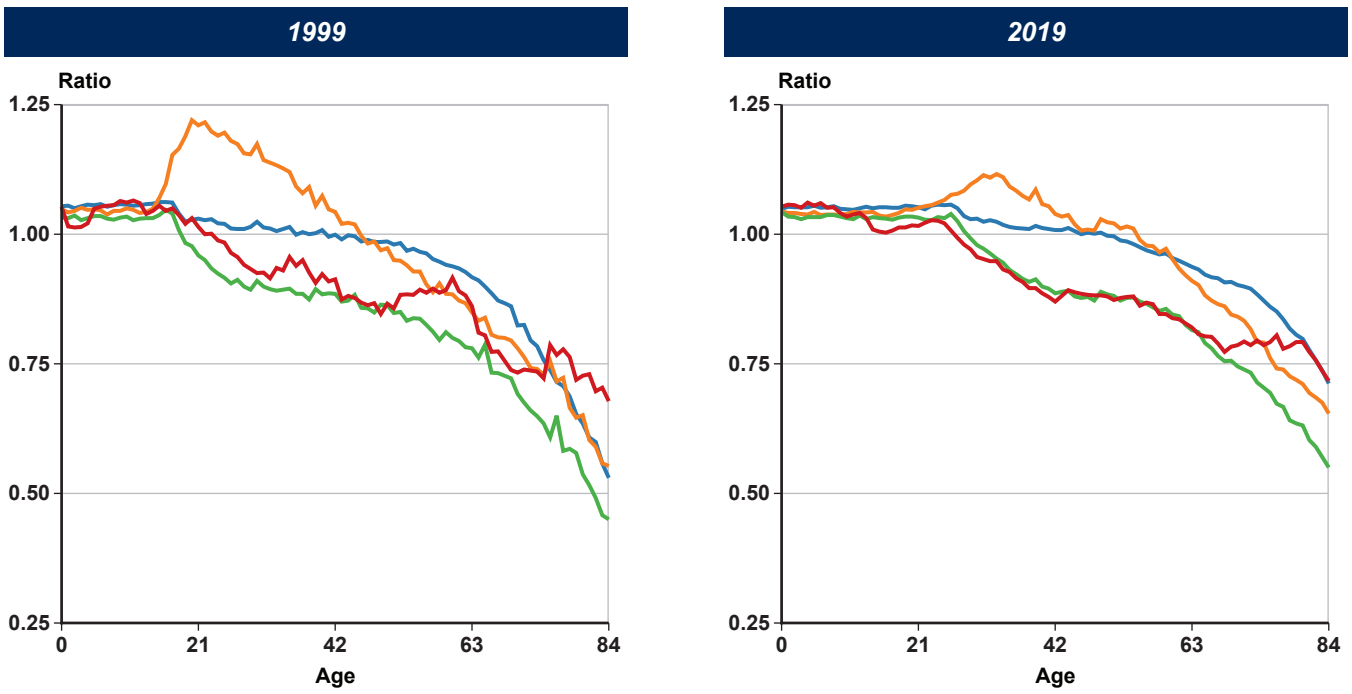
SOURCE: Author's calculations based on CDC WONDER.

and from 1999 to 2019, although for each group, the share of the population aged 0–39 declined and the share aged 50 or older increased during that span (not shown). Hispanic individuals were the youngest population group, followed by the Black and API communities: In 2019, 42.2 percent of the Hispanic population was younger than 25, compared with 36.9 percent of Black individuals, 30.8 percent of API people, and 27.3 percent of the WNH population. The population age profiles in Chart 2 illustrate the disproportionate influence of immigration in the API and Hispanic populations relative to the Black and WNH communities. From 1999 to 2019, the API and Hispanic populations increased substantially at every age. The Hispanic population increased by 9.1 million among those younger than 25, by 14.5 million among those in the midlife ages (25–64), and by almost 3 million among those aged 65 or older. For API individuals, the population aged 65 or older more than tripled (from about 800,000 to 2.7 million), while the population in the midlife ages almost doubled, increasing by 6.1 million. By 2019, no RE group had a higher share of its population in the midlife ages than the API community (56.9 percent). By contrast, the continuing predominance of the Baby Boom generation among the Black and WNH populations is easy to distinguish in Chart 2, as the cohort of individuals aged 35–53 in 1999 shifts to the right, becoming the group aged 55–73 in 2019.

Chart 2 further reveals interesting differences in gender composition across RE groups, particularly among the Hispanic community. Men constitute a disproportionately large share of the Hispanic population aged 20–39, likely reflecting immigration patterns. In most populations, the natural male-to-female ratio at birth is typically above 1 (for example, it was 1.05 for the entire U.S. population in 2019 [not shown]). As age increases, the ratio declines, eventually dropping below 1 as all-cause mortality rates are higher among males than females. For the 2019 U.S. population, women begin to outnumber men by age 38.

Chart 3 plots the male-to-female population ratio as a function of age in 1999 and in 2019 for each RE group. In 1999, the number of females began to exceed the number of males at age 19 in the Black population, at age 24 in the API community, at age 41 among WNH individuals, and at age 46 in the Hispanic population. By 2019, the male-to-female ratio dropped below 1 at older ages than in 1999 for all RE groups. Across the midlife ages (25–64), the male-to-female ratios among the Black and API populations were

Chart 3.
Male-to-female population ratio, by RE group and age, 1999 and 2019



SOURCE: Author's calculations based on CDC WONDER.

substantially lower than those of the Hispanic and WNH populations. In 2019, women first outnumbered men at age 55 among the Hispanic group, age 50 for WNH individuals, age 29 for the Black population, and age 27 in the API community. Chart 3 further confirms the unusually large number of Hispanic men relative to women in early adulthood. In 1999, the male-to-female ratio for the Hispanic population aged 17–30 exceeded 1.15 but it had declined substantially by 2019. Imbalanced sex ratios can affect various economic and social variables. For instance, Angrist (2002) found that shifting migration patterns and immigration restrictions in the early 20th century led to more uneven sex ratios among many ethnic groups, resulting in a positive effect in the likelihood of female marriage, but a decline in female labor force participation for those groups.

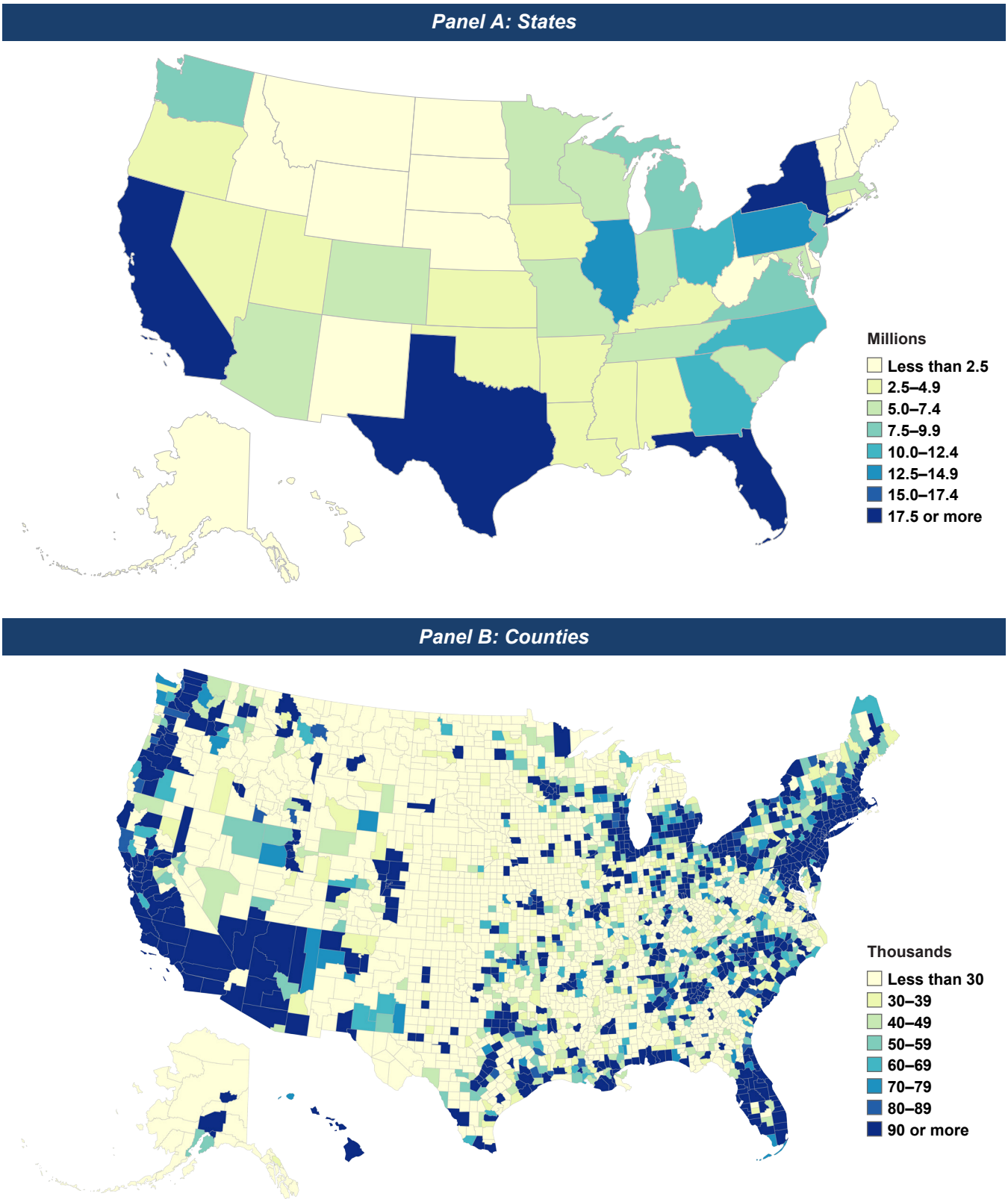
The Geography of Race and Hispanic Origin

Charts 4 and 5 show heterogeneity in the geographic distribution of both the overall population of the United States and the various RE groups that compose it. In Chart 4, Panels A and B respectively show U.S. states and counties by their 2019 population counts. California (39.5 million residents), Texas (almost 29 million), Florida (21.5 million), and New York (19.5 million) were the four most populous states. Five additional states (Pennsylvania, Illinois, Ohio, Georgia, and North Carolina) had populations of more than 10 million. Panel A shows that 16 states had fewer than 2.5 million residents in 2019; of these, Wyoming, Vermont, the District of Columbia, Alaska, North Dakota, South Dakota, and Delaware each had fewer than 1 million residents. With county-level detail, Panel B illustrates that the population tends to concentrate on the Pacific coast and Northeast corridor, along with parts of the Southern border, the Florida peninsula, and the Great Lakes. Of the 3,142 counties in the United States, more than one-third (1,048) had fewer than 15,000 residents in 2019. Los Angeles County (CA) was the most populous, with more than 10 million people. Of the 45 U.S. counties with a population of more than 1 million, 26 were in California, Texas, Florida, and New York; the others were Cook County (IL), Maricopa and Pima Counties (AZ), Clark County (NV), King County (WA), Wayne and Oakland Counties (MI), Middlesex County (MA), Philadelphia and Allegheny Counties (PA), Franklin and Cuyahoga Counties (OH), Hennepin County (MN), Salt Lake County (UT), Fairfax County (VA), Wake and Mecklenburg Counties (NC), Fulton County (GA), and Montgomery County (MD).

Chart 5 shows, for each RE group, its percentage of the total population in each state and county in 2019. Note that a few counties in Panels D, F, and H are shaded gray to indicate populations low enough to require data suppression.[11] More than 90 percent of the population in Maine, Vermont, West Virginia, and New Hampshire was WNH, and the WNH population share also exceeded 80 percent in Montana, Iowa, Kentucky, Wyoming, North Dakota, Idaho, South Dakota, Wisconsin, Minnesota, and Missouri (Panel A). By contrast, only one-quarter of the population in Hawaii was WNH, and less than one-half of residents in New Mexico (37.6 percent), California (37.9 percent), the District of Columbia (38.1 percent), Texas (42.1 percent), and Nevada (49.8 percent) were WNH. The WNH population fell between 50 percent and 60 percent in Maryland, Georgia, Florida, Arizona, New Jersey, New York, Mississippi, and Louisiana. More than one-third of U.S. counties had a population that was more than 90 percent WNH (Panel B), although those counties combined accounted for only about 10 percent of the U.S. population. By comparison, many of the most populated counties had significantly smaller shares of WNH residents, including the most populous county (Los Angeles, CA, with a WNH population share of 27.1 percent), and the third most populous (Harris, TX, with 4.7 million residents and a WNH share of 29.5 percent).

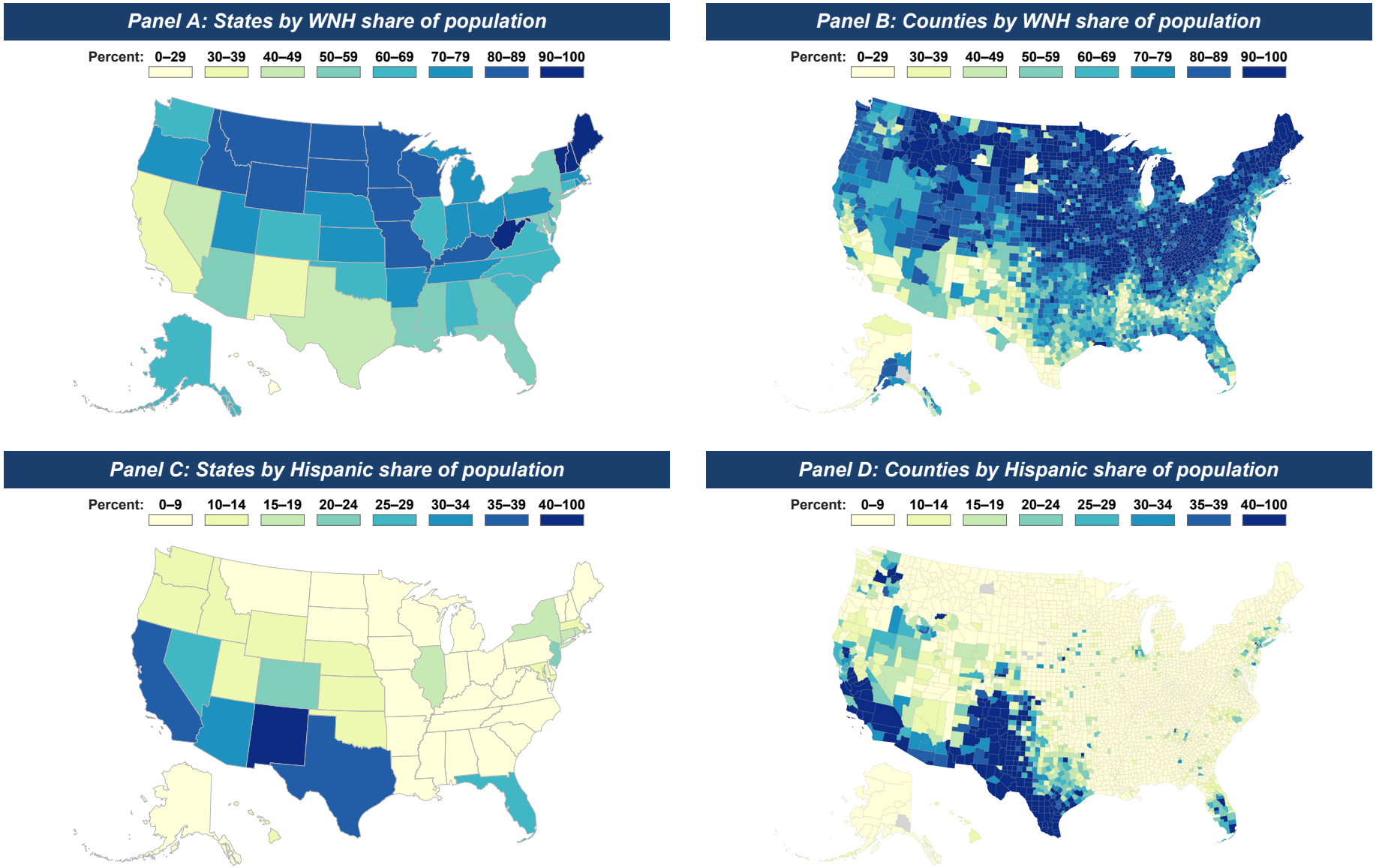
Panel C shows that the state with the highest proportion of Hispanic residents was New Mexico (49.3 percent of the population), followed by Texas (39.8 percent) and California (39.4 percent). Hispanic residents accounted for 31.7 percent of the population in Arizona, 29.2 percent in Nevada, and 26.4 percent in Florida. Between 20 percent and 25 percent of the population in New Jersey and Colorado were Hispanic, as were 19.3 percent of New York residents and 17.5 percent of Illinois residents. The lowest Hispanic population shares occurred in West Virginia (1.7 percent) and Maine (1.8 percent), and Hispanic residents also constituted less than 5 percent of the populations in Vermont, Mississippi, Kentucky, New Hampshire, Ohio, Montana, North Dakota, South Dakota, Missouri, and Alabama. Panel D shows that the Hispanic population generally concentrates along the Southern border, the West coast, and south Florida. In 104 U.S. counties, Hispanic people constituted at least half of the population, and only nine of them are outside of Texas, California, New Mexico, Arizona, or Florida: Adams, Franklin, and Yakima Counties (WA);

Chart 4.
States and counties by population size, 2019



SOURCE: Author's calculations based on CDC WONDER.

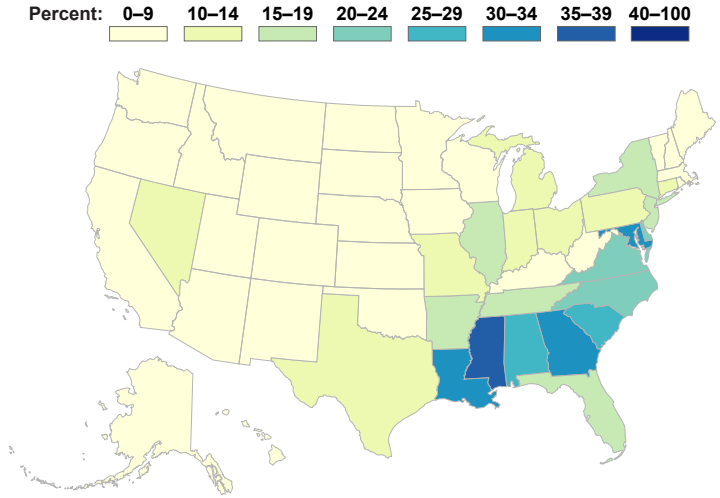
Chart 5.
States and counties by RE group population shares, 2019



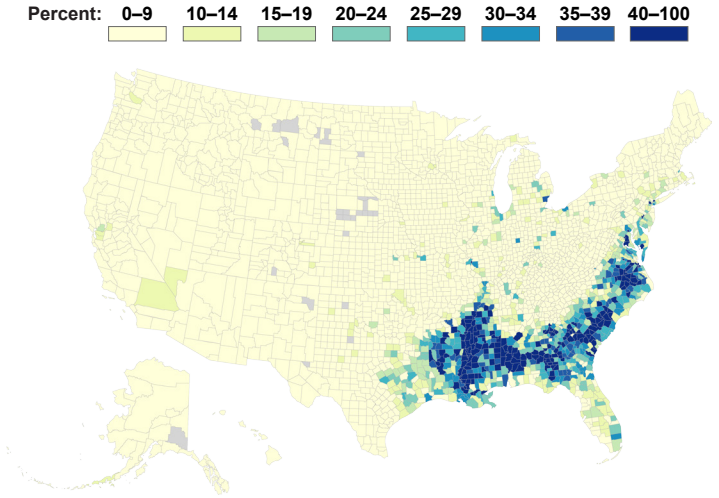
(Continued)

Chart 5.
States and counties by RE group population shares, 2019—*Continued*

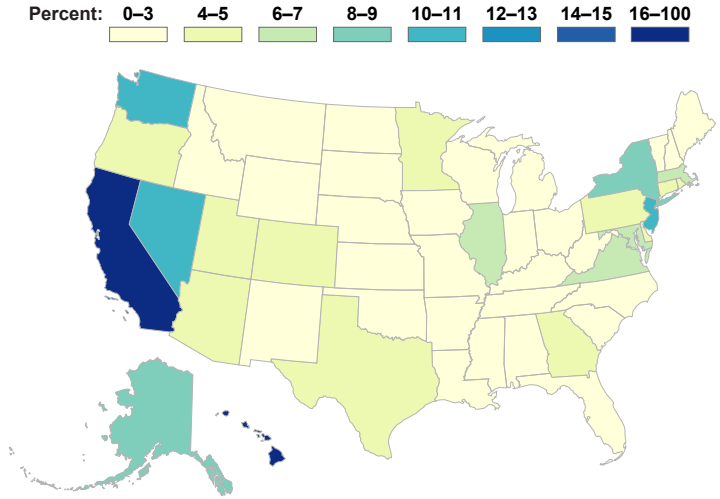
Panel E: States by Black share of population



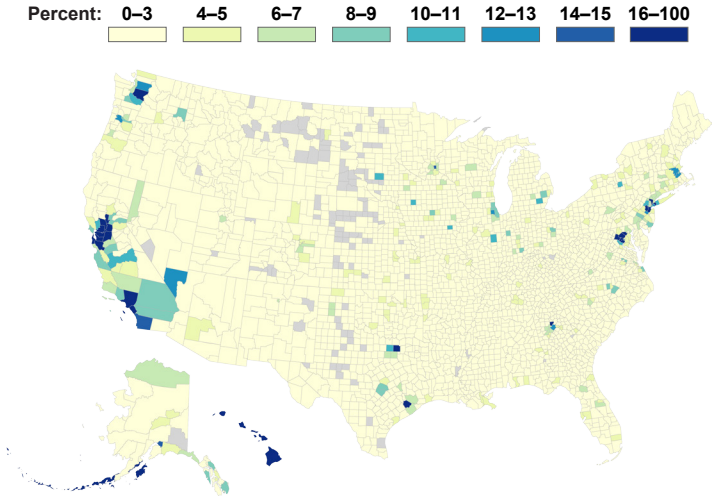
Panel F: Counties by Black share of population



Panel G: States by API share of population



Panel H: Counties by API share of population



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Values for gray-shaded counties are missing, statistically unreliable, or suppressed to avoid disclosing information about particular individuals.

Seward, Ford, and Finney Counties (KS); Costilla and Conejos Counties (CO); and Bronx County (NY).

The states with the highest concentrations of Black residents included the District of Columbia (47.5 percent), Mississippi (38.4 percent), Louisiana (33.5 percent), Georgia (33.4 percent), and Maryland (32.2 percent; Panel E). Black individuals also represented more than 20 percent of the population in South Carolina, Alabama, Delaware, North Carolina, and Virginia. Conversely, less than 2 percent of the population in Montana, Idaho, Wyoming, Vermont, and Utah was Black, and the Black population also accounted for less than 5 percent of the residents of Maine, New Hampshire, South Dakota, Oregon, Hawaii, New Mexico, North Dakota, West Virginia, Iowa, and Alaska. The counties with the highest shares of Black residents were in southern states (Panel F). In 2019, Black residents accounted for more than half of the population in 104 counties. The most populous of them were Prince George's County (MD) and Shelby County (TN), each with almost 1 million residents overall; and DeKalb County (GA) and Baltimore City (MD),[12] each with more than 500,000 residents overall. Counties with more than 1 million residents where one-third to one-half of the population is Black included Bronx and Kings Counties (NY), Fulton County (GA), Philadelphia County (PA), Wayne County (MI), and Mecklenburg County (NC).

The states with the highest percentages of API residents were Hawaii (66.2 percent) and California (16.9 percent; Panel G).[13] Washington (11.3 percent) and Nevada and New Jersey (10.4 percent each) had the next highest percentages of API residents. Other states with an API population share of more than 7 percent were New York, Alaska, Massachusetts, Virginia, and Maryland. By contrast, 20 states had shares of API residents below 3 percent; and in West Virginia, Montana, Mississippi, Wyoming, Maine, Alabama, South Dakota, Kentucky, and North Dakota, the share was below 2 percent. With some exceptions, the API population concentrates on the West coast and portions of the Northeast corridor. The five counties for which more than half of the population is API are all in Hawaii (Panel H). In counties with a total population of at least 100,000 in 2019, the API share of residents was 20–49 percent in Santa Clara, San Francisco, Alameda, San Mateo, Orange, and Contra Costa Counties (CA); Queens County (NY); Middlesex County (NJ); King County (WA); Fort Bend County (TX); Fairfax and Loudoun Counties (VA); and Howard County (MD).

An Overview of Mortality Cause Categories

This section describes broad cause-of-death categories, based on the ICD-10's classification chapters. Mortality is classified into one of the 17 categories listed in Box 1, shown with the corresponding ICD-10 codes.

The charts shown in this section and in the sections that follow detail U.S. mortality patterns over the period 1999–2019 variously by cause, RE group, sex, and age group. See the Notes on the Mortality Charts below for information on interpreting both the charts and the discussions that accompany them.

Notes on the Mortality Charts

The charts that follow depict mortality experiences by cause in the period 1999–2019 and compare the patterns across various groups.

RE groups
- WNH
- Black (may be Hispanic)
- Hispanic (any race)
- Asian (may be Hispanic)

Age groups
- Younger ages (0–24)
- Midlife ages (25–64)
- Aged (65 or older)
- All ages combined

Sex
- Males/men
- Females/women

An *RE/sex group* is one of the eight possible combinations of RE group and sex.

An *RE/age group* is one of the 16 possible combinations of RE group and age group.

A *population group* is one of the 32 possible combinations of RE group, age group, and sex.

Because the population sizes of the groups and subgroups vary widely, so do their respective death counts. Charts showing death counts often use different vertical axis scales for each RE group to provide proportional comparisons. Likewise, charts showing mortality rates by cause may use different vertical axis scales for age groups with widely varying rates.

All mortality rates are age-adjusted and are shown per 100,000 population.

The text that accompanies the charts sometimes cites figures that are not shown, or are difficult to discern, in the charts.

Box 1.
Major cause-of-death categories

Formal title	Brief title	ICD code(s)
Diseases of the circulatory system	Circulatory system diseases	I00–I99
Neoplasms	Cancers	C00–D48
Diseases of the respiratory system	Respiratory system diseases	J00–J98
External causes of mortality	External causes	V01–Y89
Diseases of the nervous system	Nervous system diseases	G00–G98
Endocrine, nutritional, and metabolic diseases	Endocrine, nutritional, and metabolic diseases	E00–E88
Mental and behavioral disorders	Mental and behavioral disorders	F01–F99
Diseases of the digestive system	Digestive system diseases	K00–K92
Diseases of the genitourinary system	Genitourinary system diseases	N00–N98
Certain infectious and parasitic diseases	Infectious and parasitic diseases	A00–B99
Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified	Abnormal clinical findings	R00–R99
Diseases of the musculoskeletal system and connective tissue	Musculoskeletal system diseases	M00–M99
Diseases of the blood and blood-forming organs and certain disorders involving the immune system	Blood diseases	D50–D89
Certain conditions originating in the perinatal period	Perinatal conditions	P00–P96
Congenital malformations, deformations, and chromosomal abnormalities	Congenital anomalies	Q00–Q99
Diseases of the skin and subcutaneous tissue	Skin diseases	L00–L98
Complications of pregnancy, childbirth, and the puerperium	Pregnancy/childbirth complications	O00–O99

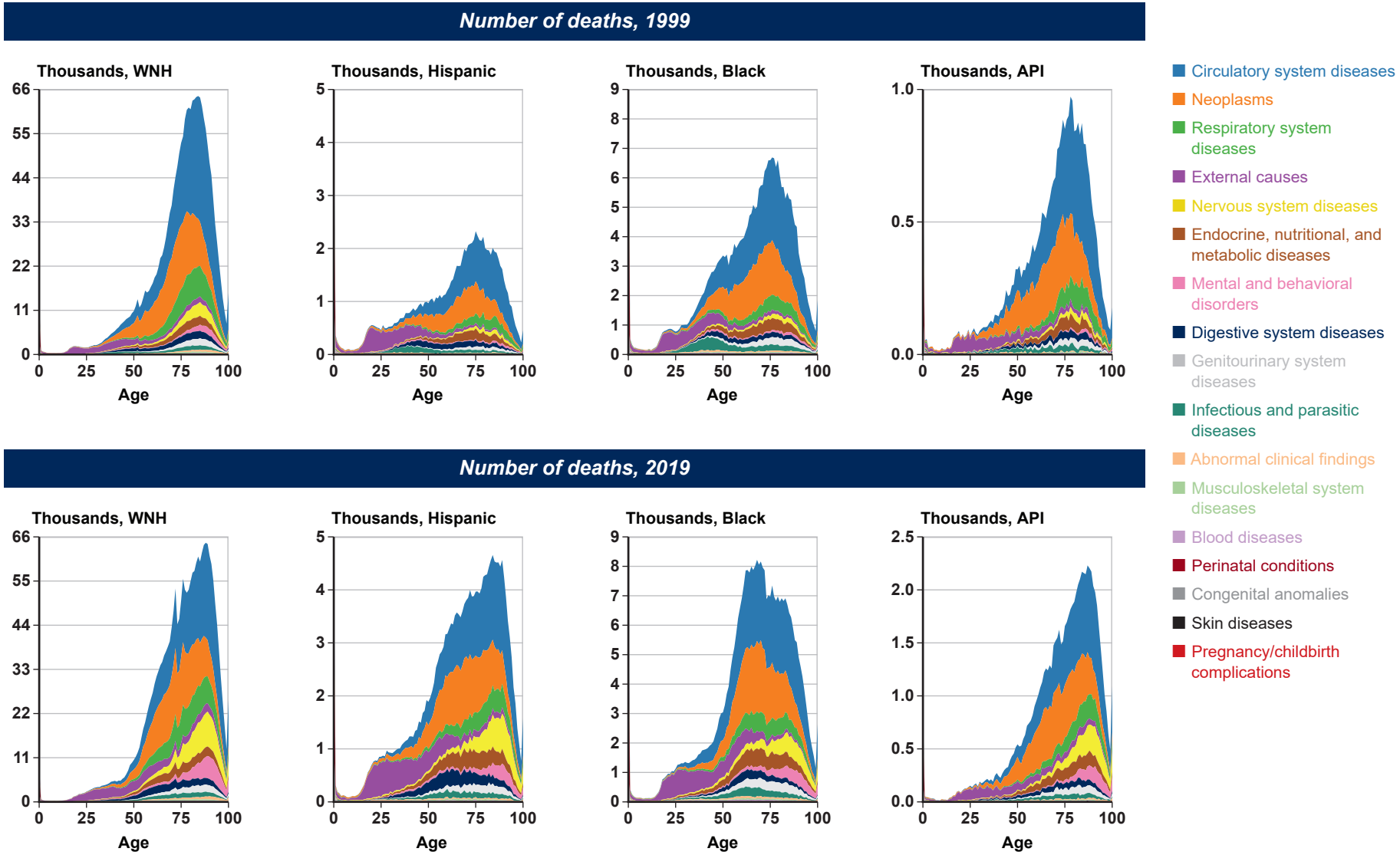
SOURCE: ICD-10.

Chart 6 shows the number and percentage distribution of deaths by category for 1999 and 2019, with detail by RE group and age. Variation in the age distributions of the RE groups and in age-specific mortality rates account for differences in the relative shape of the death count profiles. For instance, deaths resulting from external causes appear much more prominent among the Hispanic population than for WNH individuals. However, the Hispanic community experiences a significantly lower age-adjusted mortality rate from external causes than does the WNH population. Thus, the difference in shape between the graphs is mostly determined by differing age distributions, in that the Hispanic population is substantially younger. In the area plots showing the percentage distribution of deaths by cause for each RE group by single year of age, the different age distributions between the groups are factored out.

Diseases of the circulatory system were the leading cause of death in each RE group across most ages, followed by neoplasms (cancers). At younger ages (0–24) and the midlife years (25–64), however, external causes of mortality, which include traffic-related and other accidents, assaults, suicides, and drug overdoses, were one of the primary causes of death. The share of deaths caused by respiratory diseases was generally greater among the WNH population than for other groups. In 1999, it was the third leading cause of death for all RE groups at ages 65 or older. Nevertheless, when combining all ages, external causes still accounted for a higher proportion of deaths than respiratory disorders among the Black, Hispanic, and API communities.

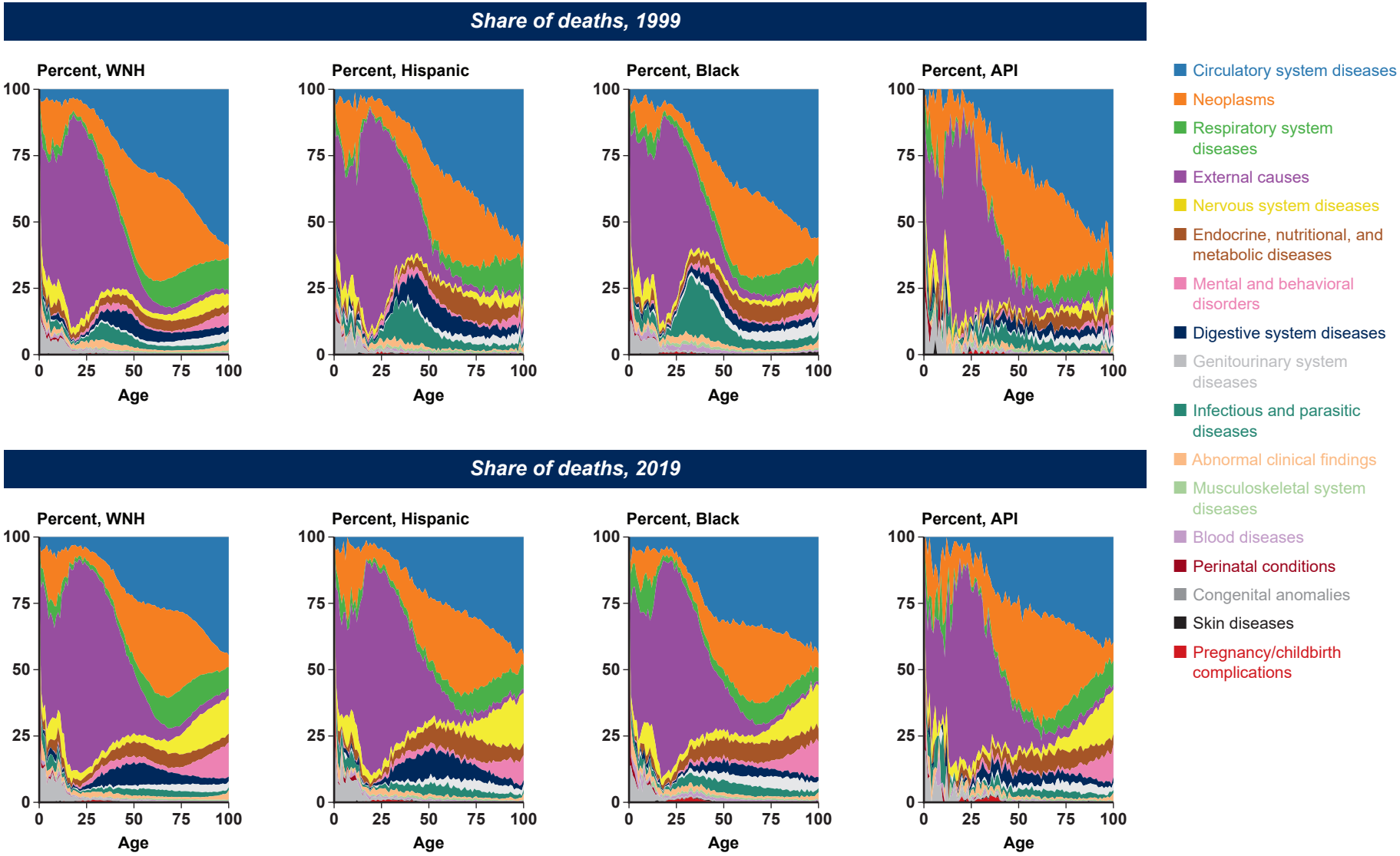
Driven in large part by the acquired immune deficiency syndrome (AIDS) epidemic, the percentage of deaths caused by infectious and parasitic diseases was significantly higher in 1999 than in 2019, particularly among the Black and Hispanic populations. For instance, in 1999, infectious and parasitic diseases accounted for more than 10 percent of deaths among Black people aged 25–64, compared with 3 percent among the WNH population in the midlife years. The percentage of deaths caused by diseases of the digestive system was higher for Hispanic people than any other RE group, while deaths related to endocrine,

Chart 6.
Number and percentage distribution of deaths by cause-of-death category, by RE group and age, 1999 and 2019



(Continued)

Chart 6.
Number and percentage distribution of deaths by cause-of-death category, by RE group and age, 1999 and 2019—*Continued*



SOURCE: Author's calculations based on CDC WONDER.

nutritional, and metabolic diseases (such as diabetes) accounted for a larger proportion of mortality among the Black and Hispanic populations than for the other RE groups. There were also substantial changes over time in the categorical distribution of causes of death. From 1999 to 2019, the percentage of deaths attributed to circulatory system diseases declined for all four RE groups. For instance, in 1999, 40.8 percent of deaths in the WNH population involved circulatory diseases, but the share had dropped to 30.7 percent by 2019. During this period, the percentage of deaths caused at older ages by mental and behavioral disorders (such as dementia) and diseases of the nervous system (such as Alzheimer's disease, Parkinson's disease, and other degenerative disorders) rose dramatically. In 1999, the two categories combined (mental disorders and diseases of the nervous system) constituted 5.7 percent of deaths among the WNH population. By 2019, that share had risen almost to 14 percent.

Chart 7 shows age-adjusted mortality rates by age group, RE group, and sex for 1999–2019. As noted earlier, all mortality rates discussed in this article are age-adjusted deaths per 100,000 population. Chart 7 covers all-cause mortality and mortality for each of 17 cause-of-death categories. The panel for each cause-of-death category (as well as the all-causes panel) includes one plot showing age-adjusted mortality rates for all ages combined and three additional plots, one each for age groups 0–24, 25–64, and 65 or older. Notice that age-adjusted mortality rates are irrelevant for certain causes and age groups but are included nonetheless for the sake of completeness. For example, mortality rate plots at ages 0–24 for many causes appear quite "noisy" because the numbers of deaths from those causes (such as diseases of the skin and subcutaneous tissue or mental and behavioral disorders) are negligible. Conversely, almost 99 percent of deaths caused by conditions originating in the perinatal period occur before age 1 (Panel O), rendering the plots for ages 25–64 and 65 or older virtually meaningless. In addition, mortality caused by complications of pregnancy, childbirth, and the puerperium is negligible for women aged 65 or older and nonexistent for males (Panel R).[14]

All-Cause Mortality

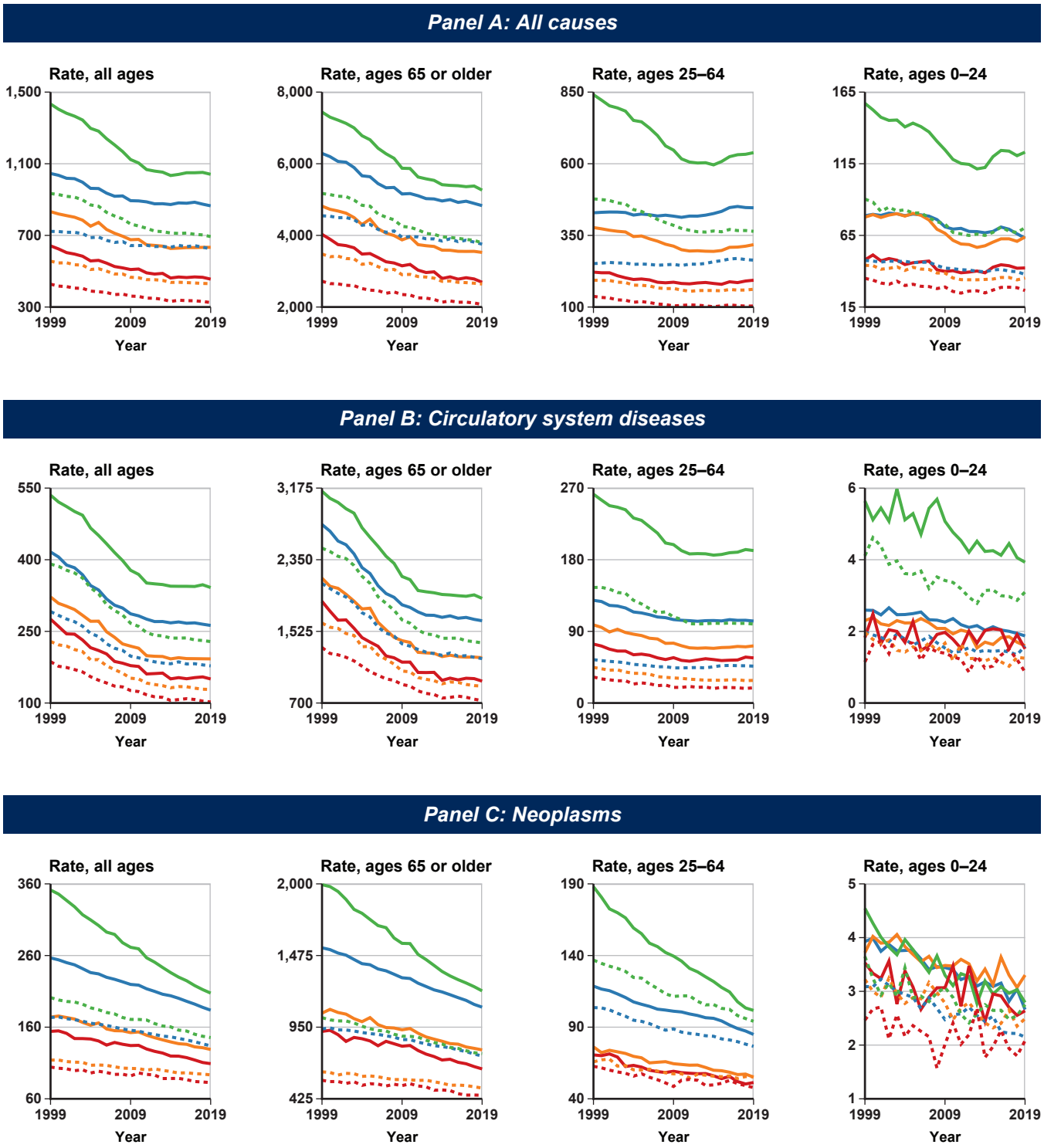
Panel A presents all-cause mortality rates. For all RE groups, males had higher rates than females. For either sex, Black individuals had the highest mortality rates, followed by the WNH population. Hispanic people had lower all-cause mortality rates than WNH people, a phenomenon often referred to as the Hispanic mortality paradox because their lower mortality belies a socioeconomic disadvantage relative to the WNH population.[15] The API community experienced the lowest all-cause mortality rate. For all ages combined, mortality rates improved (that is, declined) more slowly for WNH males and females than for all other RE/sex groups. As a result, the mortality gap between the Black and the WNH populations narrowed substantially over the period. For instance, in 1999, mortality rates were 1,433.7 and 1,045.6 for Black and WNH males, respectively. By 2019, the respective rates had dropped to 1,041.0 and 864.9. Put differently, in 1999, 388 more Black males than WNH males died per 100,000, but the gap declined to 176 more deaths per 100,000 by 2019. Over the entire 1999–2019 period, mortality rates within a given RE group improved at a higher rate for males than for females, narrowing the gender gap.

In 2019, Black females had a higher all-cause mortality rate than both API and Hispanic males, while WNH females had a higher mortality rate than API males. Much of the all-cause mortality rate improvement in each RE/sex group occurred during the first decade of the 1999–2019 period and was more pronounced among those aged 65 or older than at other ages. In fact, all-cause mortality rates in the midlife ages were higher in 2019 than in 1999 for both WNH males (446.3 versus 428.8) and WNH females (263.6 versus 251.5). By about 2014, all-cause mortality rates in the 25–64 age group began to increase for almost every RE/sex group. Specifically, the mortality rate among those aged 25–64 was higher in 2019 than in 2010 for every RE/sex group except Black and API women.

Long-term increases in U.S. life expectancy at birth plateaued in 2010 and expectancy declined in 2015, 2016, and 2017 (Woolf and Schoomaker 2019). This reversal was the culmination of a trend beginning in the 1990s, when mortality at ages 25–64 began to rise, especially for certain causes. Americans in the midlife ages experienced a surge in deaths driven by the near-term effects of drug overdoses, alcohol abuse, and suicides, often referred to as "deaths of despair" (Case and Deaton 2020). Initially, the rising rate in deaths of despair was offset by concurrent declines in other leading causes of death, such as traffic accidents, ischemic heart disease, cancer, and HIV infection. However, by 2010, all-cause mortality at ages 25–64 began to rise, and by 2014, it was increasing across all RE groups (Woolf and Schoomaker 2019).

Chart 7.
Age-adjusted mortality rates, by cause-of-death category, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

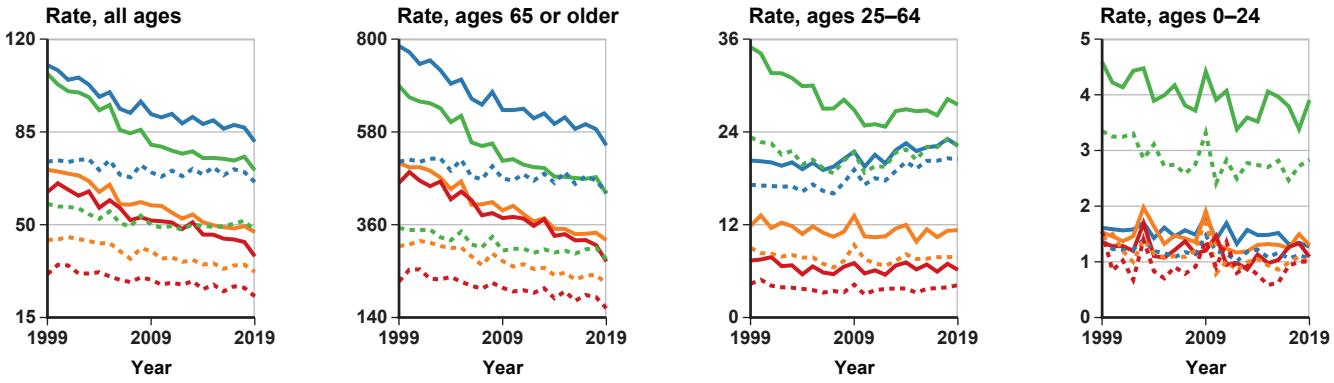


(Continued)

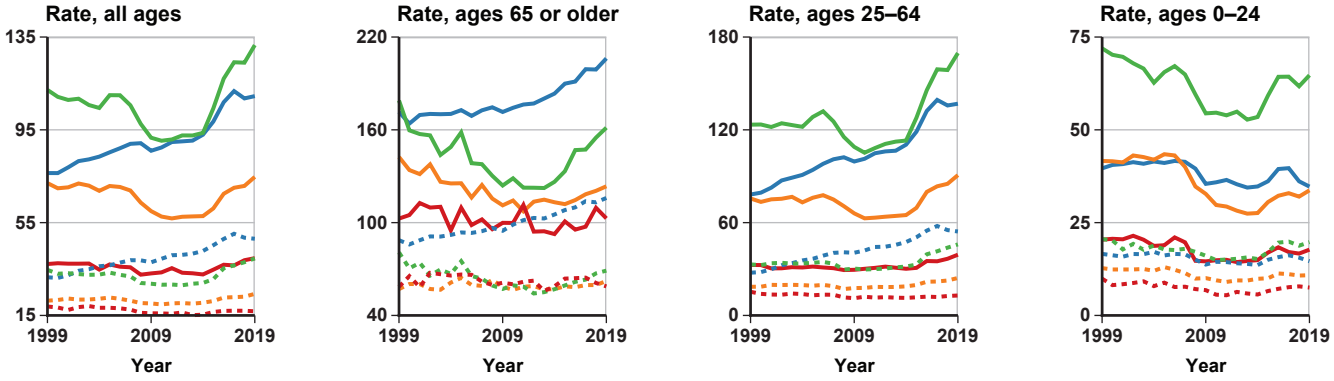
Chart 7.
Age-adjusted mortality rates, by cause-of-death category, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

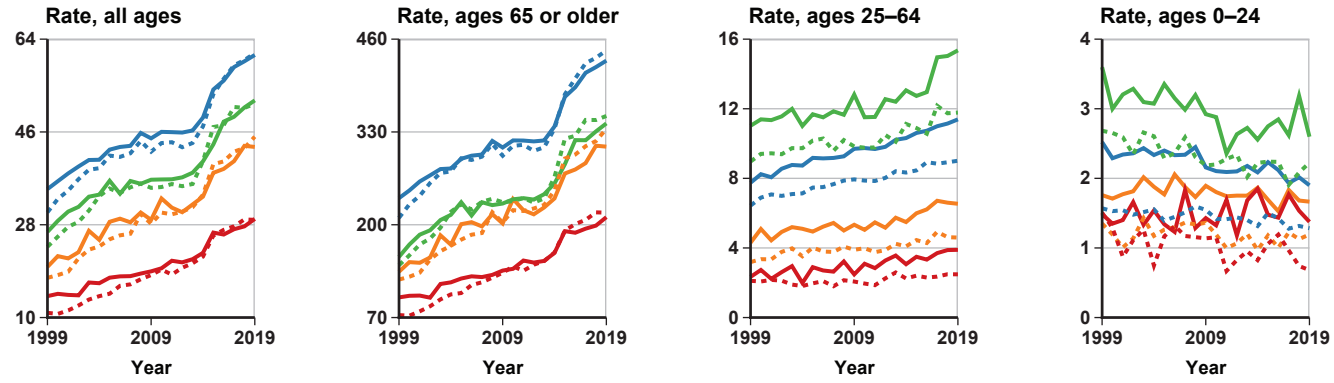
Panel D: Respiratory system diseases



Panel E: External causes



Panel F: Nervous system diseases

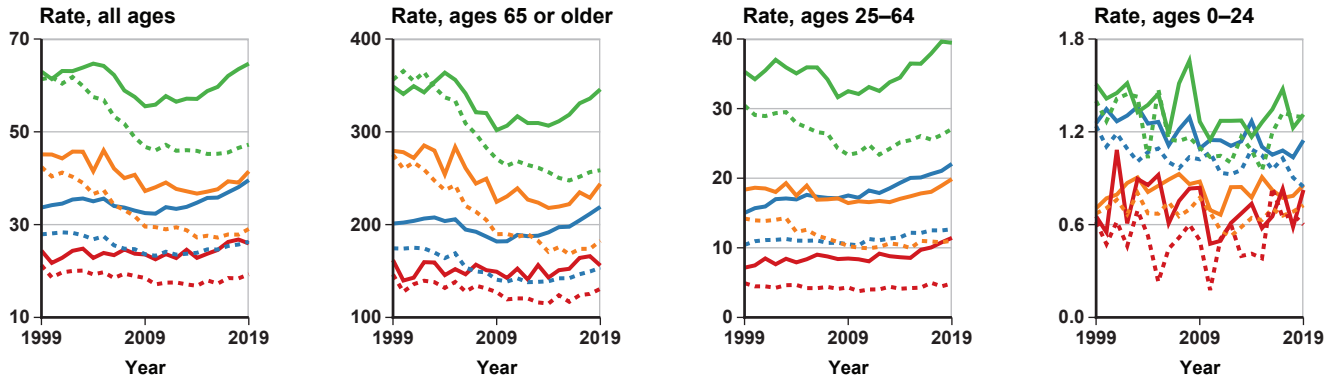


(Continued)

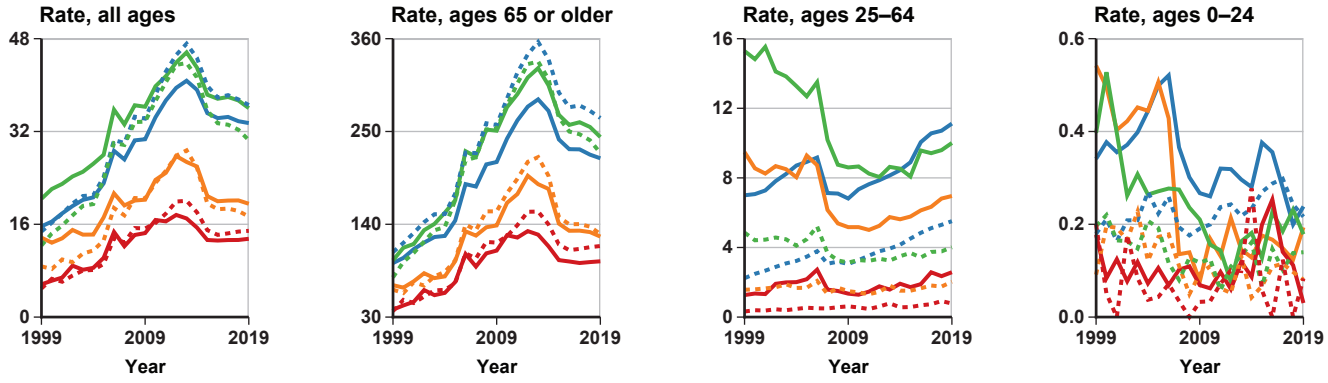
Chart 7.
Age-adjusted mortality rates, by cause-of-death category, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

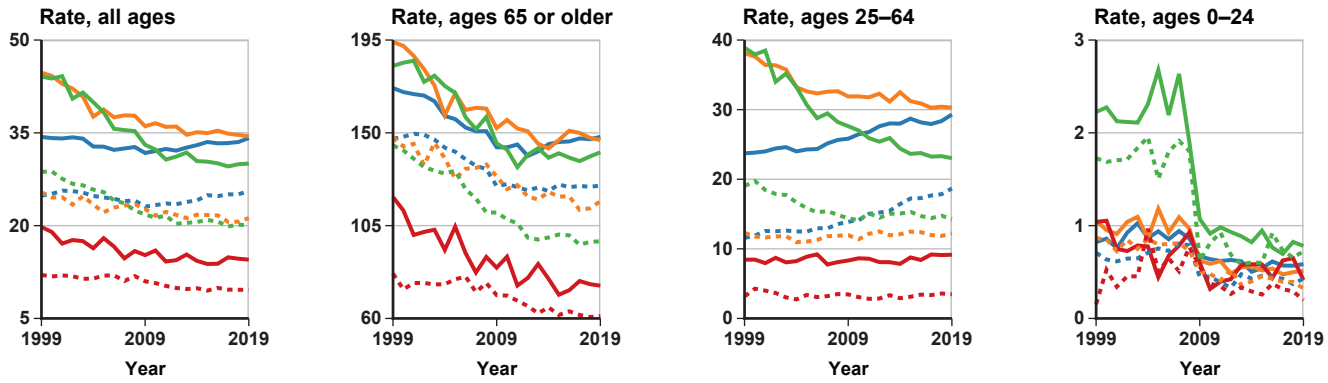
Panel G: Endocrine, nutritional, and metabolic diseases



Panel H: Mental and behavioral disorders



Panel I: Digestive system diseases

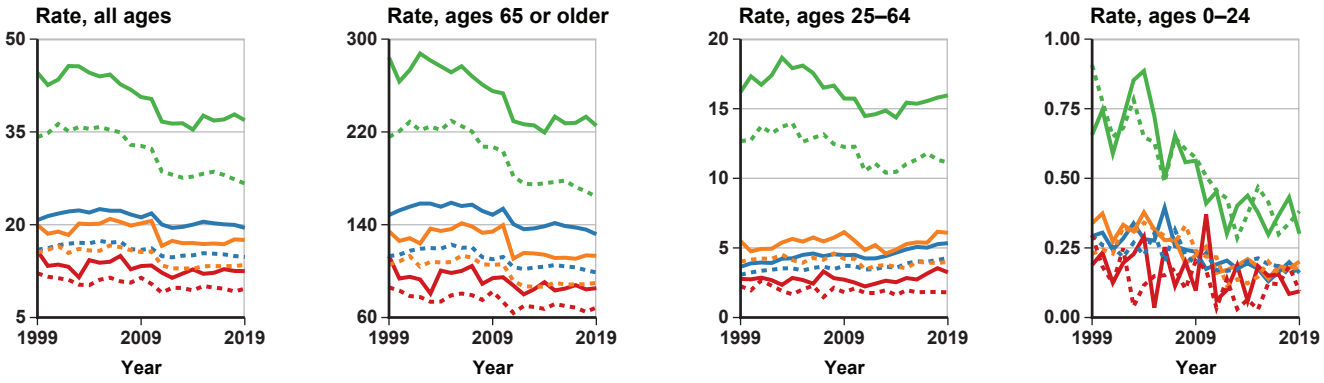


(Continued)

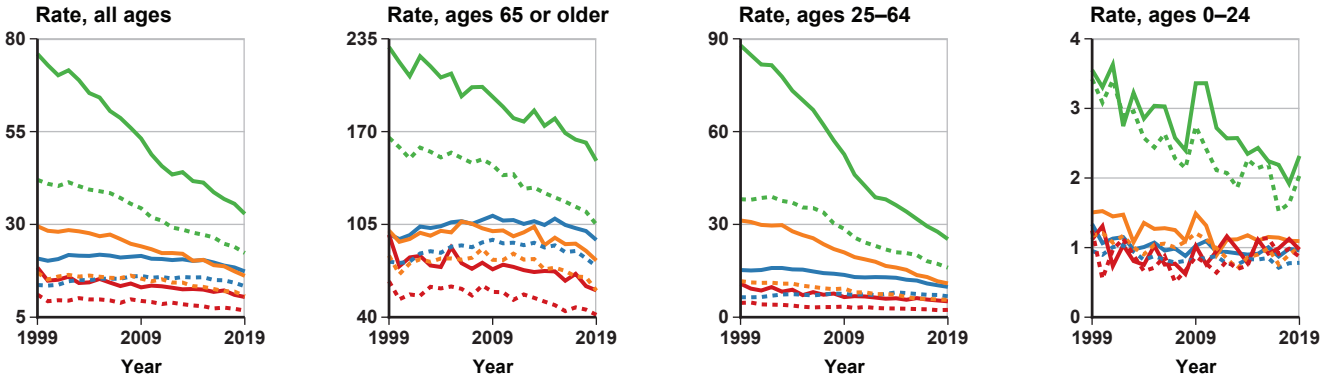
Chart 7.
Age-adjusted mortality rates, by cause-of-death category, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

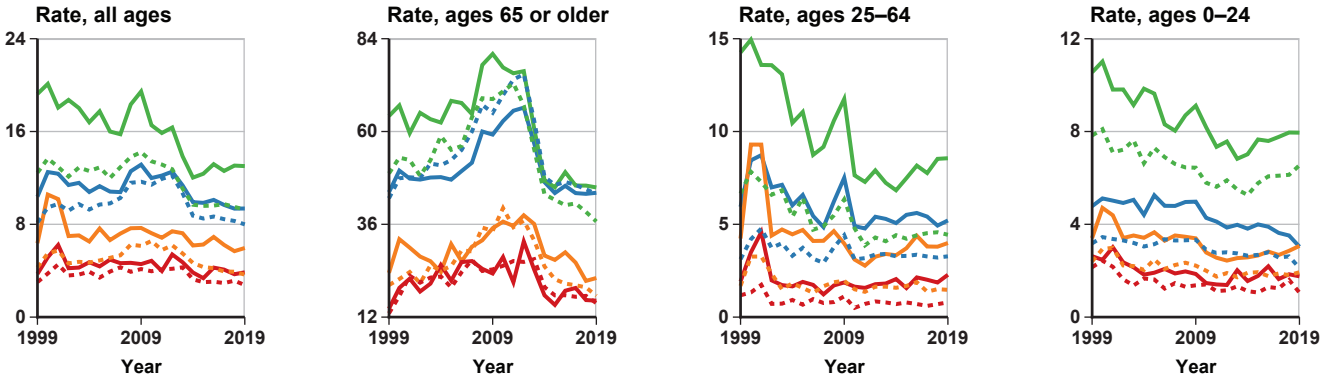
Panel J: Genitourinary system diseases



Panel K: Infectious and parasitic diseases



Panel L: Abnormal clinical findings

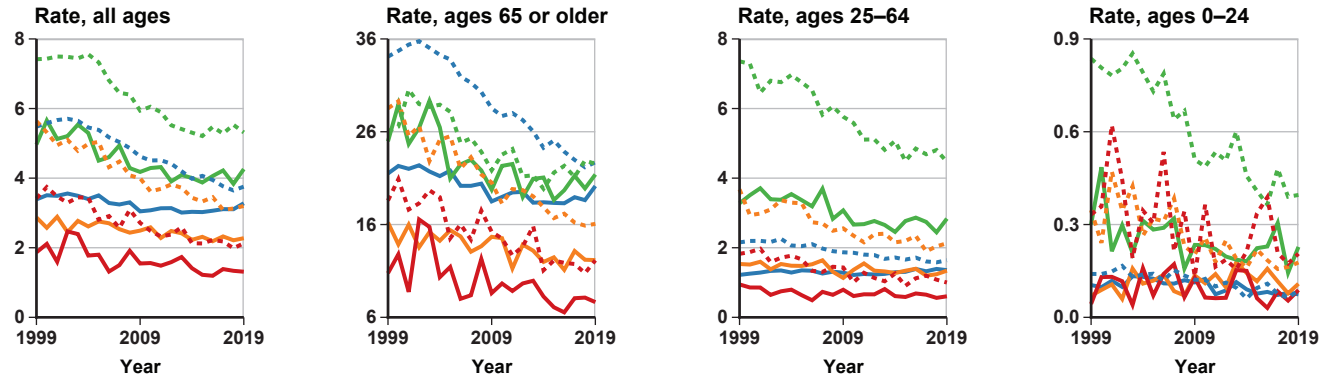


(Continued)

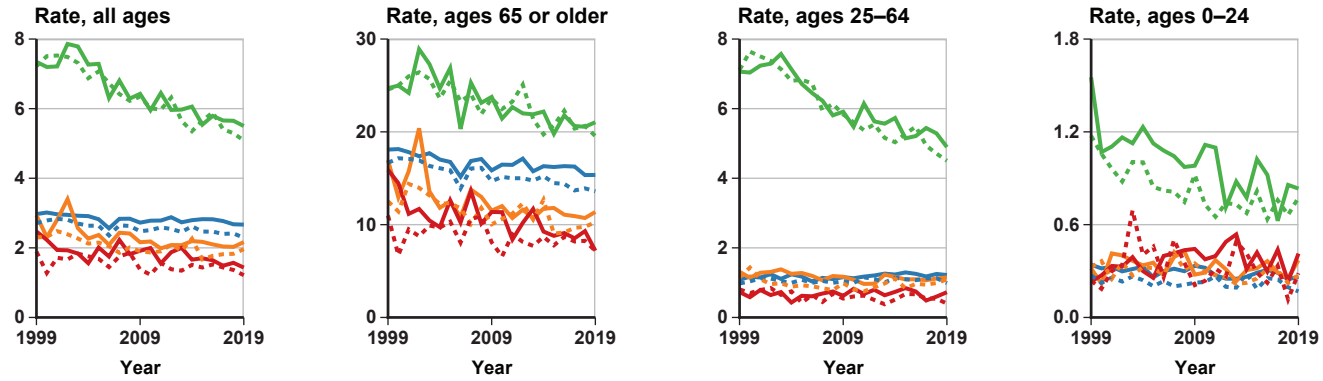
Chart 7.
Age-adjusted mortality rates, by cause-of-death category, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

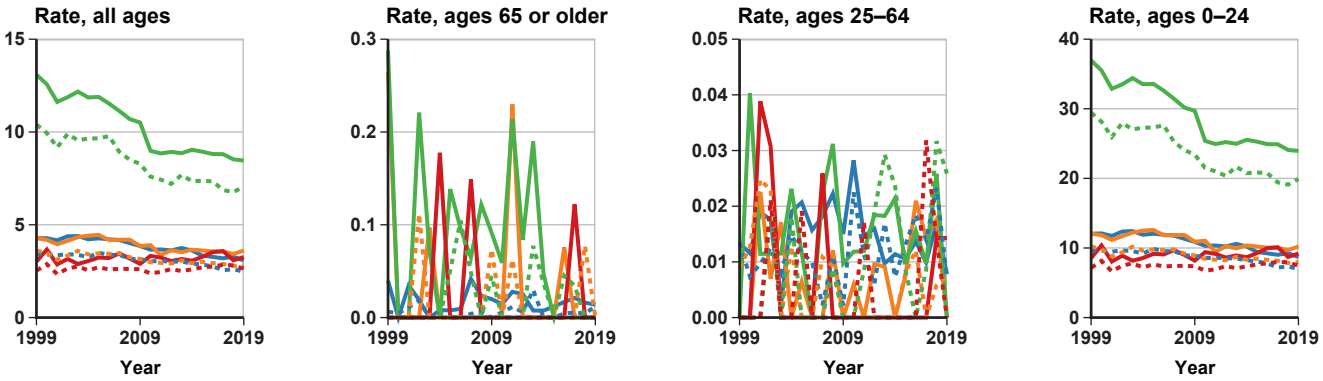
Panel M: Musculoskeletal system diseases



Panel N: Blood diseases



Panel O: Perinatal conditions

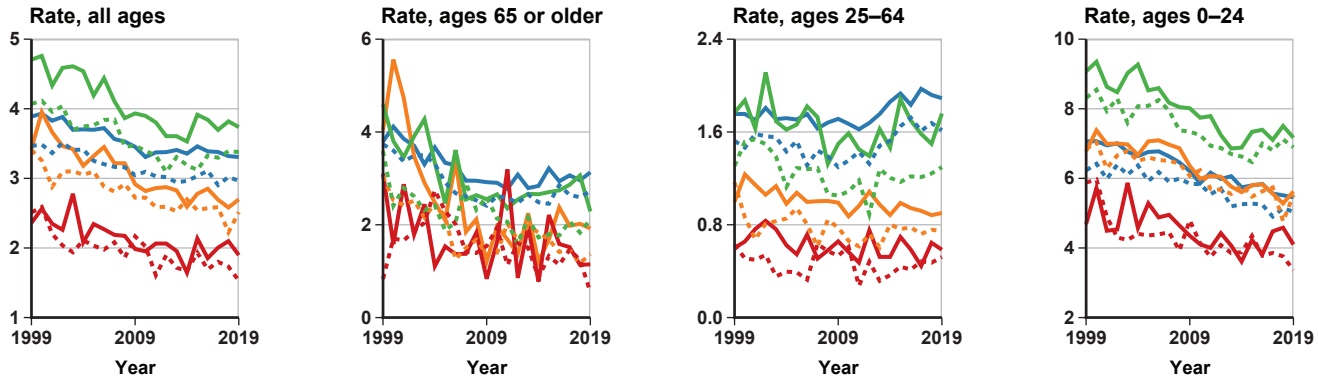


(Continued)

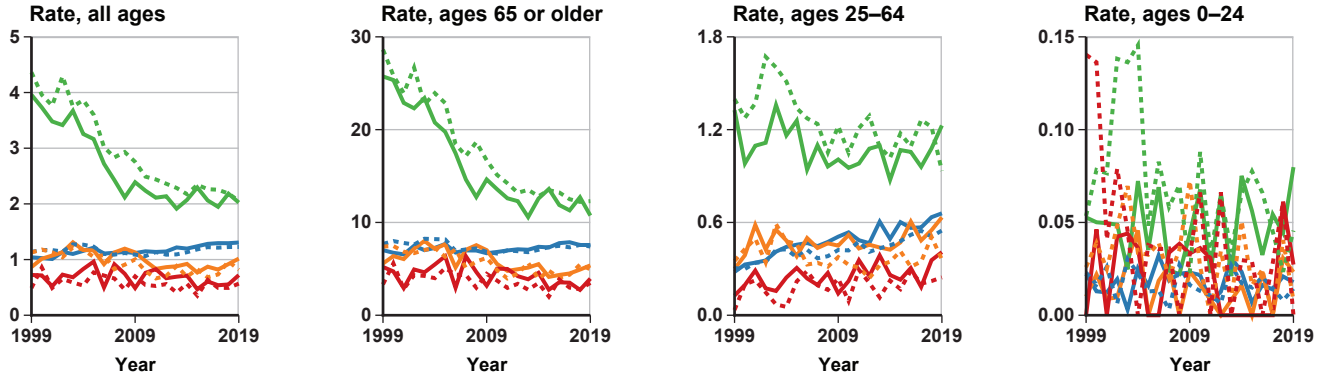
Chart 7.
Age-adjusted mortality rates, by cause-of-death category, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

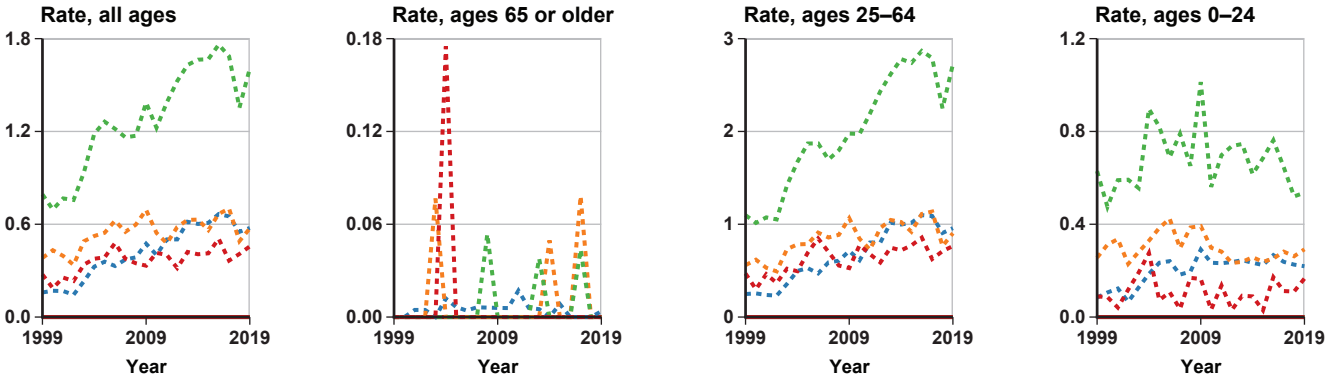
Panel P: Congenital anomalies



Panel Q: Skin diseases



Panel R: Pregnancy/childbirth complications



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Diseases of the Circulatory System

Circulatory system diseases were the leading all-ages cause of death among the four RE groups in 2019, accounting for 27–32 percent of deaths in each group and totaling 874,613 deaths overall.[16] However, the proportion of deaths caused by circulatory system diseases has steadily declined over time (Chart 6). For instance, in 1999, diseases of the circulatory system respectively caused 40.8 percent and 32.7 percent of deaths among WNH and Hispanic people. However, by 2019, the corresponding percentages were 30.7 percent for the WNH population and 27.6 percent for the Hispanic community. Typically, circulatory system diseases account for a small percentage of deaths at younger ages (less than 4 percent for those aged 0–24), but the share increases steadily with age. By the midlife years, diseases of the circulatory system in 2019 accounted for 20.6 percent and 29.1 percent of deaths among Hispanic and Black individuals, respectively. However, for those aged 65 or older, circulatory system diseases caused at least one-third of all deaths in 2019, irrespective of RE group.

Chart 7, Panel B shows that from 1999 to 2019, the all-ages circulatory system disease mortality rates for both males and females in every RE group declined by more than one-third, and most of the improvement occurred during the first decade of the period. Circulatory system disease mortality rates also dropped more rapidly for the aged than for those in the midlife years. By 2010, mortality rates had begun either to decline at a slower rate, to flatten, or to increase among those in the midlife years or younger ages. For example, from 2010 to 2019, the circulatory system disease mortality rate among WNH men aged 25–64 dropped only from 103.9 to 103.0, while the rate for WNH women in the same age group increased from 44.1 to 46.3. This pause in the improvement over time in the circulatory system disease mortality rate is one factor contributing to the increase in all-cause mortality in the midlife ages exhibited in the last decade (Woolf and Schoomaker 2019; Case and Deaton 2020). Black males had the highest all-ages circulatory disease mortality rate in 2019 (341.8), followed by WNH males (262.4) and Black females (228.6). By contrast, API and Hispanic females had the lowest all-ages circulatory system disease mortality rates, at 102.2 and 128.4, respectively. Note that at ages 65 or older, WNH women and Hispanic men had relatively similar mortality rates in 2019 (1,211.3 and 1,222.4, respectively). However, at ages 25–64, WNH women experienced lower circulatory system disease mortality rates than both Hispanic and API men.

Neoplasms

In 2019, cancers (neoplasms) were the second most common cause of death after circulatory system diseases, accounting for at least one-fifth of deaths for all ages combined, ranging across the RE groups from 20.7 percent of deaths in the Black population to 25.3 percent among API people.[17] At ages 0–24, the shares of deaths attributable to this category ranged from 2.9 percent for Black individuals to 7.2 percent in the API community. As illustrated in Chart 6, the share of deaths from neoplasms typically peaks between ages 50 and 75 and then progressively declines at older ages, as other groups of impairments account for relatively larger proportions of deaths. In 2019, cancer caused 615,191 deaths. As a percentage of all deaths, cancer ranks higher in the API population than for the other RE groups; yet for either sex, cancer-related mortality rates are lower for the API community than for any other RE group (Chart 7, Panel C).

Unlike the death rates for circulatory system diseases, those for cancer generally declined steadily throughout 1999–2019. The cancer mortality rates of Black males and females improved more rapidly than those of any other RE/sex group, substantially narrowing the mortality gap with their WNH counterparts. For example, in 1999, over all ages combined, Black males and females respectively experienced 94.8 and 27.8 more deaths per 100,000 than their WNH counterparts. By 2019, the gaps had narrowed to 23.8 and 11.6, respectively. At ages 65 or older, Hispanic men had a higher cancer mortality rate than both Black and WNH women. During the midlife ages, however, Black women had the second highest cancer mortality rate (after Black men), followed in turn by WNH men and WNH women. The gender gap in cancer death rates also narrowed over time for every RE group. For instance, in 1999, the cancer mortality rate for Black men aged 65 or older (1,994.2) was almost twice that of Black women (1,019.6). By 2019, the gender ratio in mortality rates for that age group had declined from 2.0 to 1.6.

Diseases of the Respiratory System

In 2019, respiratory system diseases accounted for 6.6 percent of deaths in both the Black and Hispanic groups, 7.4 percent of deaths for API individuals, and 10.3 percent of deaths among WNH people. In total, 271,026 deaths were caused by respiratory system diseases. The share of all deaths attributed to this category was higher for the WNH population than the other RE groups (Chart 6). Chart 7, Panel D shows that WNH males had the highest all-ages respiratory disease death rates, followed by Black males and WNH females, making this one of the few ICD-10 chapter-level categories in which mortality was higher among WNH males and females than their Black counterparts. For instance, in 2019, the respiratory system disease death rates were 81.3 and 70.5 among WNH and Black males, respectively, and the rate for WNH females (66.1) was 1.4 times higher than that of Black females. This disparity was driven by mortality at ages 65 or older. At ages 0–24 and 25–64, Black people had higher death rates than members of the same sex in the other RE groups.

Over the 1999–2019 period, mortality caused by diseases of the respiratory system declined substantially, particularly among the non-WNH RE groups. Nevertheless, respiratory system disease mortality at ages 25–64 was higher in 2019 than in 2010 for every RE/sex group. The all-ages death rate improved at a faster pace among males than females, narrowing the gender gap. Hence, from 1999 to 2019, the male-to-female respiratory disease mortality ratio dropped from 1.5 to 1.2 among WNH individuals, from 1.9 to 1.5 among Black people, from 1.6 to 1.5 among the Hispanic community, and from 2.0 to 1.7 for the API population.

External Causes of Mortality

External causes of mortality comprise transportation accidents, assaults, suicides, and any other accidental causes of death, including drug and alcohol overdoses. External causes of mortality account for larger shares of deaths among men than women, and for Hispanic and Black individuals than for the WNH and API populations. In 2019, roughly 8 percent of deaths at all ages combined among the WNH and API populations were due to external causes, compared with 10.8 percent of deaths among Black people and 12.9 percent of deaths among Hispanic individuals. For Hispanic and Black males, the percentages of 2019 deaths caused by external factors were 17.7 percent and 15.5 percent, respectively, representing the third leading cause-of-death category after circulatory system diseases and neoplasms. At ages 0–24, external causes overwhelmingly accounted for the most deaths (Chart 6), representing in 2019 more than half of deaths among WNH people, about 45 percent of deaths among Black and Hispanic individuals, and about 40 percent of deaths in the API community. At ages 25–64, external causes of mortality in 2019 exceeded all other causes among Hispanic and WNH men (29.9 percent and 25.3 percent, respectively), were the second leading cause of death among Black men (25.4 percent), and were the third leading cause of death among API men and among women of all RE groups. On the other hand, the shares of deaths caused by external factors at ages 65 or older were low, ranging from 2.6 percent among the Black population to 3.7 percent for the WNH population. Overall, 251,350 deaths in 2019 were attributed to external causes.

All-ages external-cause mortality rates were higher in 2019 than in 1999 for all RE/sex groups except API females (Chart 7, Panel E). The all-ages death rates increased steadily among adult WNH males and females after 1999. For the other RE/sex groups, however, mortality rates generally declined throughout the first decade of the period, but they increased after about 2010. Among males, all-ages mortality rates from external causes were highest for those who were Black, followed in order by those who were WNH and Hispanic. In 1999, for instance, all-ages mortality rates for Black and WNH males were 112.2 and 76.4, respectively. By 2014, the mortality-rate gap between those two populations had almost disappeared (93.7 and 92.9, respectively), but it widened thereafter. Conversely, the gap in all-ages mortality between Hispanic and WNH males widened considerably from 1999 to 2019, rising from 4.3 to 34.8 additional deaths per 100,000 among WNH males. Among females, those who are WNH had the highest age-adjusted external-cause mortality rate after 2002.

At ages 0–24, Black individuals had the highest external-cause mortality rates among both males and females. At ages 65 or older, however, men and women who were WNH had higher mortality rates than those of other RE groups. In the midlife ages, Black people had the highest mortality rate among men, while

WNH individuals had the highest mortality among women. Furthermore, external-cause mortality typically increased at a much higher rate in the midlife years than at ages 65 or older. For instance, from 1999 to 2019, the external-cause mortality rate of WNH women aged 25–64 almost doubled, from 27.6 to 54.3 deaths; yet at ages 65 or older, the rate increased more gradually, from 88.6 to 115.9. Mortality caused by external factors differed widely by sex. Specifically, the male-to-female ratio in mortality rates was higher for external causes than for any other ICD-10 chapter-level category. All-ages male external-cause mortality rates exceeded those of females in 2019 by a factor of 2.3 for the WNH population, 2.4 for the API population, 3.1 among Hispanic people, and 3.3 for the Black community.

Diseases of the Nervous System

The share of deaths that are caused by nervous system diseases increased rapidly from 1999 to 2019 (Chart 6), driven by higher incidence of Alzheimer's and Parkinson's diseases and other degenerative disorders at older ages. In each RE group, nervous system diseases accounted for a higher share of deaths among women than men. In addition, this category's share of all deaths was higher in the WNH population than for the other RE groups. For instance, in 1999, diseases of the nervous system at all ages accounted for 3.8 percent of deaths among WNH individuals and 2.1 percent of deaths among Black people. By 2019, those shares had risen to 8.8 percent and 5.5 percent, respectively. At ages 65 or older, more than 12 percent of WNH and Hispanic women, 10.6 of API women, and 9.0 percent of Black women died of nervous system diseases. In 2019, 233,715 Americans of all ages died of nervous system diseases.

Chart 7, Panel F shows that from 1999 to 2019, nervous system disease mortality rates increased substantially for every RE/sex group. Further, within each RE group, mortality rates by sex converged. WNH males and females had the highest mortality rates, followed by Black males and females. The all-ages nervous system disease mortality rate rose from 34.9 to 60.9 for WNH males during the period, and from 30.4 to 61.3 for WNH females. All-ages mortality rates rose faster for females than males, more than doubling in every female RE group over the 1999–2019 period. Nervous system disease mortality rates also increased during the observation period for people in the midlife ages, although at a far slower pace than at older ages, with the Black population experiencing the highest death rates in the 25–64 age group.

Endocrine, Nutritional, and Metabolic Diseases

In 2019, endocrine, nutritional, and metabolic diseases such as diabetes constituted roughly 1 in 20 deaths overall, ranging from 4.5 percent of deaths among WNH people to 6.5 percent of deaths among Hispanic and Black individuals. The share of deaths from these diseases has increased moderately over time among all RE groups but is disproportionately higher for the Black and Hispanic communities (Chart 6). In 2019, 140,107 deaths were attributed to these diseases. Chart 7, Panel G shows that Black males had the highest all-ages endocrine, nutritional, and metabolic disease mortality rate in 2019 (64.7), followed by Black females (47.2) and Hispanic males (41.5). Hispanic females had higher endocrine, nutritional, and metabolic disease mortality rates than WNH males until 2007, after which the gap reversed and widened, reaching 39.6 for WNH males and 29.1 for Hispanic females in 2019. API females had the lowest all-ages endocrine, nutritional, and metabolic disease mortality rate, at 19.3. In addition, although Hispanic males and females experienced higher all-ages endocrine, nutritional, and metabolic disease mortality rates than their WNH counterparts (a rare departure from the Hispanic paradox), that gap narrowed considerably over the observation period.

All-ages endocrine, nutritional, and metabolic disease mortality rates declined among all RE groups from 1999 to 2010, but then they increased (except among Black females, for whom the 2011 and 2019 mortality rates were the same). As a result, the all-ages death rate was higher in 2019 than in 1999 for WNH, Black, and API males. Chart 7, Panel G shows the 1999–2019 trends that resulted in the male-to-female endocrine, nutritional, and metabolic disease mortality ratio increasing from 1.2 to 1.5 among WNH people, from 1.0 to 1.4 for the Black population, from 1.1 to 1.4 among the Hispanic community, and from 1.2 to 1.3 in the API population. This divergence occurred among both aged adults and those in the midlife years. At ages 65 or older, Hispanic men and women experienced higher endocrine, nutritional, and metabolic disease mortality rates than WNH men and women, while at ages 25–64, rates were higher among WNH individuals than in the Hispanic population.

Mental and Behavioral Disorders

Like the pattern for diseases of the nervous system, the share of deaths caused by mental and behavioral disorders rose over the observation period (Chart 6), fueled by both a higher incidence of "unspecified dementia and other organic disorders" among people aged 65 or older and a rise in mental and behavioral disorders resulting from psychoactive substance use at ages 25–64 beginning around 2010. At all ages combined, the percentage of deaths caused by mental and behavioral disorders is higher among females than males, and higher in the WNH population than for the other RE groups. For instance, in 1999, 1.8 percent of WNH individuals died of mental and behavioral disorders. By 2019, that share had risen to 5.1 percent. Overall, 133,959 people died of mental and behavioral disorders in 2019. That year, 10.7 percent of WNH women aged 85 or older died from causes in this category.

Chart 7, Panel H shows that for every RE group, mental and behavioral disorder death rates rose sharply until 2013, then declined. The all-ages death rate from mental and behavioral disorders was highest for Black males until 2011, when their mortality rate was surpassed by that of WNH women. In 2019, the all-ages mental and behavioral disorder mortality rate was 36.6 for WNH females, 36.0 for Black males, 33.4 for WNH males, and 30.5 for Black females. Hispanic people experienced substantially lower mortality rates from mental and behavioral disorders (19.5 for males and 17.3 for females), while API males had the lowest mortality rate, at 13.5. At ages 65 or older, mortality rates roughly tripled from 1999 to 2019 for Black and API women and more than doubled for all other RE/sex groups except Hispanic men.

Diseases of the Digestive System

In 2019, the shares of deaths caused by digestive system diseases ranged from 3.0 percent in the Black population to 5.7 percent for the Hispanic community. The incidence of these deaths peaked in the midlife ages. For instance, in 2019, the percentage of deaths attributed to diseases of the digestive system among individuals aged 25–64 was 8.7 percent for Hispanic people, 6.8 percent for WNH individuals, 4.1 percent among the API population, and 3.8 percent for the Black community. Digestive system diseases caused 112,894 deaths in 2019. Chart 7, Panel I shows that Hispanic and Black males had the highest all-ages digestive system disease death rates from 1999 to 2005, and although the rates for both groups continued to decline, the mortality rate for Black males dropped more sharply until 2011, when it was first surpassed by the mortality rate for WNH males. Similarly, among females, those who are Black had the highest digestive system disease mortality rate in 1999. By 2019, however, Black males and females both had lower mortality rates than their counterparts in the WNH and Hispanic communities. On the other hand, the all-ages mortality rates from digestive system diseases for API males and females were half those of their Black counterparts.

Age-adjusted digestive system disease mortality rates in the midlife ages rose significantly for WNH men and women from 1999 to 2019 (from 23.7 to 29.3 among men and from 11.6 to 18.7 among women). By contrast, mortality rates at ages 25–64 declined throughout this period for the Black and Hispanic populations. This trend reflects a significant rise in alcoholic and other liver diseases among WNH men and women, part of the increase in deaths of despair. As is further discussed later, from 1999 to 2019, the share of digestive system disease deaths that is attributed to alcoholic and other liver diseases rose from 37.8 percent to 49.1 percent among the WNH population and from 64.1 percent to 69.5 percent in the Hispanic community.

Diseases of the Genitourinary System

In 2019, the shares of deaths at all ages that were caused by genitourinary system diseases ranged from 2.4 percent for WNH people to 3.5 percent for Black individuals. The genitourinary disease share of deaths increased slightly from 1999 to 2019 in all RE groups and tended to be higher among females than males and among Black and Hispanic individuals than API and WNH people. In 2019, 72,871 people died of causes in this category, and roughly 70 percent of these deaths involved renal failure. Chart 7, Panel J shows that Black males had the highest all-ages genitourinary disease mortality rates throughout the observation period, followed by Black females. In 1999, the mortality rates for Black males and females (44.6 and 34.2, respectively) more than doubled those of their WNH counterparts (20.7 and 16.0, respectively). Hispanic males and females had lower all-ages genitourinary disease mortality rates than their WNH counterparts, and API females experienced the lowest genitourinary

disease mortality rate (12.1). By 2019, the all-ages death rates from this category of causes had declined in every RE group—modestly so in the WNH community, and with much greater improvement for Black and API people. However, the mortality rate at ages 25–64 increased from 3.6 to 5.3 for WNH men and from 3.1 to 4.3 for WNH women in the period 1999–2019.

Infectious and Parasitic Diseases

In 2019, the percentage of all deaths that were caused by infectious and parasitic diseases ranged from 2.0 percent for WNH people to 3.3 percent among Black people (Chart 6). For men in the midlife ages, particularly those who are Black and Hispanic, the percentages tended to be slightly higher. In 2019, 64,706 deaths were caused by infectious and parasitic diseases. The share of deaths attributable to infectious and parasitic diseases, however, has declined significantly since 1999, when they accounted for 9.2 percent of deaths of Hispanic males and 11.2 percent of deaths of Black males. More than 65 percent of those deaths were attributed to HIV. Chart 7, Panel K shows that in 1999, the all-ages death rate from infectious and parasitic diseases for Black males (75.9) was more than 3.5 times that of WNH males (20.8), and the rate for Black females (42.0) was more than twice the rate for WNH males. All-ages infectious and parasitic disease mortality rates were higher for females who are Hispanic than for those who are WNH until 2008 and the rates were higher for Hispanic males than for their WNH counterparts until 2016. By 2019, the infectious and parasitic disease mortality rate of Black males at all ages had declined by more than half, while Black females and Hispanic and API males experienced a mortality-rate improvement of more than 40 percent.

Black males and females had the highest infectious and parasitic disease mortality rate in every age group but also experienced faster mortality-rate improvement. Among those aged 65 or older, for whom bacterial infection of the bloodstream (sepsis) was the leading cause of death within this category, mortality rates declined from 229.2 in 1999 to 149.6 in 2019 for Black men and from 165.8 to 104.9 among Black women. Hispanic men and women aged 65 or older had lower infectious and parasitic disease mortality rates than their WNH counterparts. At ages 25–64, mortality rate improvement was to a large extent driven by the widespread use of highly active antiretroviral therapy, an effective HIV treatment that emerged in the mid-1990s. In 1999, Hispanic men aged 25–64 had a substantially higher mortality rate from infectious and parasitic diseases than WNH men (31.3 versus 15.3). However, by 2019, the gap had largely vanished (10.9 versus 9.8). Likewise, by 2013, Hispanic women aged 25–64 had lower infectious and parasitic disease mortality rates than WNH women.

Other Causes of Death

In 2019, 14,553 deaths were caused by diseases of the musculoskeletal system and connective tissue, representing about 0.5 percent of all deaths. For a given RE group, musculoskeletal disorders accounted for a higher share of deaths among females than males and skewed toward older ages. Systemic connective tissue disorders accounted for 25.3 percent of the deaths in this category, followed by diseases of the bone and cartilage (23.3 percent), arthropathies or joint disease (22.0 percent), soft tissue disorders (18.1 percent), and all other musculoskeletal/connective tissue disorders (11.3 percent). Chart 7, Panel M shows that females in all RE groups experienced higher musculoskeletal system/connective tissue–related mortality rates than males. Black females had the highest all-ages mortality rate throughout the study period, followed by WNH females until about 2016, when their mortality rate was surpassed by that of Black males. API males consistently had the lowest musculoskeletal system/connective tissue–related mortality rate. At ages 65 or older, however, WNH women experienced the highest mortality rates of any RE/sex group in every year except 2018. In general, females have a higher prevalence of musculoskeletal disorders than males, caused in part by hormonal and anatomical differences between the sexes (Wolf and others 2015).

Another cause-of-death category combines diseases of the blood and blood-forming organs with certain disorders involving the immune mechanism; this category accounted for 10,815 deaths in 2019. About 37 percent of these deaths involved aplastic and other types of anemias, while another 25 percent were related to coagulation defects, purpura, and other hemorrhagic conditions. This category accounted for 0.3 percent of deaths among WNH people and 0.7 percent of deaths among Black people. Chart 7, Panel N shows that in 1999, the all-ages mortality rates for Black males and females were about 2.5 times the rates for their WNH counterparts. Although the

mortality rate for this cause has declined significantly for the Black population since 1999, it remained in 2019 more than twice that of any other RE group. The racial mortality gap in 1999 was wider still at ages 25–64: Compared with those of their WNH counterparts, the mortality rates were 6.5 times higher among Black men and 7.1 times higher for Black women. Beyond socioeconomic and other structural factors that might partially explain the observed disparities, individuals of African ancestry are known to have much higher prevalence of certain genetic conditions such as sickle cell and other anemias (Neel 1997).

In 2019, deaths caused by conditions originating in the perinatal period numbered 10,412, and 99 percent of them occurred before age 1. Conditions in this category include disorders related to the length of gestation and fetal growth, complications occurring in utero or during labor or delivery, and other medical conditions related to the perinatal period. At all ages, perinatal condition–related deaths accounted for more than 0.2 percent of deaths among WNH people, 0.6 percent of deaths among API individuals, and 1.0 percent of deaths among Black and Hispanic people. This cause of death represented 45.1 percent of deaths occurring before age 1 in the WNH group, 49.4 percent of those in the Hispanic community, and more than half of those for the Black and API populations. Chart 7, Panel O highlights enormous disparity by RE group in perinatal condition mortality rates. In 1999, the mortality rate for this category of causes was about three times higher for Black males and females than for their counterparts in the other RE groups. Although mortality rates for Black males and females later improved, disparities by factors of 2.4 to 2.8 remained in 2019. Consistent with findings in Ely and Driscoll (2020), the death rate for Black infants was twice that of WNH infants. In 2018, the infant death rates per 1,000 live births among the WNH and Black populations were 4.6 and 10.8, respectively.

In 2019, 9,713 deaths were caused by congenital malformations, deformations, and chromosomal abnormalities. Across RE groups, these deaths constituted from 0.3 percent of deaths among WNH individuals to 0.8 percent of deaths in the Hispanic community. Notice, however, that about 44 percent of these deaths occurred before age 1. Congenital causes accounted for many deaths occurring shortly after birth (almost one-quarter of those that occur before age 1) and represented about 10 percent of deaths among individuals aged 0–24 (Chart 6). Chart 7, Panel P shows that all-ages congenital/chromosomal abnormality–related mortality rates generally declined from 1999 to 2019 among all RE/sex groups. For those aged 0–24, Black males and females had the highest mortality rates, while API males and females had the lowest mortality rates over the observation period. However, the all-ages mortality rates for Black females and WNH males were similar.

Diseases of the skin and subcutaneous tissue accounted for 5,229 deaths in 2019 (0.2 percent of all deaths). One-fifth of these deaths involved decubitus ulcers (bed sores) and infections accounted for another three-fifths. Chart 7, Panel Q shows that Black females had the highest all-ages skin/subcutaneous tissue disease mortality rates, followed by Black males, although the mortality rates for both declined substantially over the observation period. For instance, in 1999, the skin/subcutaneous tissue disease mortality rate for Black women aged 65 or older (28.6) was almost four times that of aged WNH women (7.7). By 2019, the mortality rates for those same groups were 12.3 and 7.4, respectively.

Complications of pregnancy, childbirth, and the puerperium accounted for 1,103 deaths in 2019. Across RE groups, these causes represented from less than 0.1 percent of deaths among WNH females to 0.2 percent of deaths among Black females. Chart 7, Panel R shows increases in maternal mortality rates over the observation period, as well as substantial racial disparity. Of course, a more meaningful measure of mortality would focus on pregnant women rather than all women within a given age group. Hoyert (2021) reported the maternity- and postpartum-related mortality rate in 2019 for non-Hispanic Black women as 44 deaths per 100,000 live births, 2.5 times the rate for WNH women (17.9) and 3.5 times higher than the rate for Hispanic women (12.6). The United States has the highest maternal and infant mortality among comparable developed countries (GBD 2015 Maternal Mortality Collaborators 2016), and Black mothers and their infants experience death rates several times higher than those of their counterparts in other RE groups.

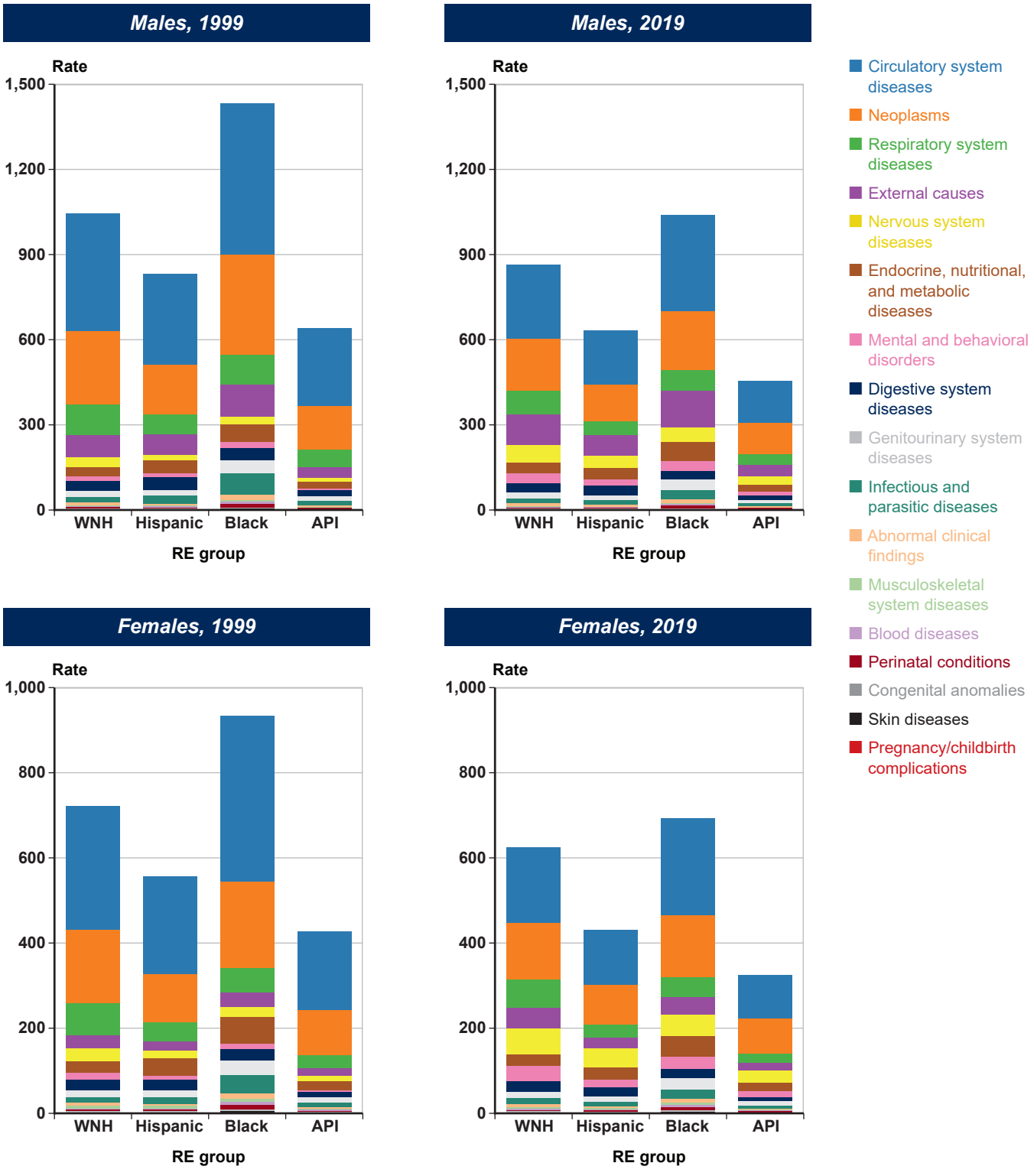
Deaths that are not attributed to any of the causes discussed above are categorized as those associated with "symptoms, signs, and abnormal clinical and

laboratory findings, not elsewhere classified." The count of deaths in this category peaked in 2012 at 42,050 before declining to 32,408 in 2019. The shares of all deaths attributed to this cause-of-death category ranged from 0.9 percent in the API population to 1.3 percent among Black individuals in 2019. Many (40.9 percent) of these deaths were attributed to a subcategory identified as "ill-defined and unknown causes of mortality" (ICD-10 codes R95–R99). Because unusually high death counts were coded R99 ("other ill-defined and unspecified causes of mortality") in California in 2000–2001, in New Jersey in 2009, and in Georgia in 2008–2009, these data should be interpreted with caution. Chart 7, Panel L shows that regardless of age, Black males generally had the highest abnormal clinical findings mortality rates, followed by Black females. API males and females generally had the lowest abnormal clinical findings mortality rates.

In summary, cause-of-death category-specific mortality trends reveal an enormous racial disparity. Black males had the highest all-ages mortality rates of any RE/sex group for every nonmaternity-related cause-of-death category throughout the 1999–2019 period, with only these exceptions: For respiratory system diseases, rates were higher among WNH males; for diseases of the digestive system, rates were higher among Hispanic males (except in 2001, 2003, and 2004) and WNH males (from 2011 to 2019); for diseases of the nervous system, rates were higher for WNH males and females; for musculoskeletal system and skin diseases, rates were higher for Black females; and for mental and behavioral disorders, rates were higher for WNH females (from 2011 to 2019). All-ages mortality rates among females were higher for those who are Black than for those in any other RE group in most causes of death, including circulatory system diseases; cancer; endocrine, nutritional, and metabolic diseases; infectious and parasitic diseases; genitourinary system diseases; conditions originating in the perinatal period; congenital malformations, deformations, and chromosomal abnormalities; complications of pregnancy, childbirth, and the puerperium; diseases of the blood and blood-forming organs; diseases of the musculoskeletal system and connective tissue; diseases of the skin and subcutaneous tissue; and symptoms, signs, and abnormal clinical and laboratory findings not elsewhere classified. In 2019, the Hispanic mortality paradox (lower death rates among Hispanic individuals than for the WNH population) was substantiated for all cause-of-death categories except endocrine, nutritional, and metabolic diseases; conditions originating in the perinatal period; and diseases of the digestive system in particular, for which Hispanic males had the highest all-ages mortality rates.

Chart 8 shows all-ages mortality rates by cause-of-death category, RE group, and sex in 1999 and 2019. In 1999, the mortality rate from the combination of circulatory system diseases and neoplasms was higher for Black individuals than the all-cause mortality rate in both the API and Hispanic communities, regardless of sex. For Black males, the combination of four impairment groups (circulatory system diseases, neoplasms, respiratory system diseases, and external causes of mortality) resulted in an age-adjusted mortality rate (1,105.7) well above the all-cause mortality rate among WNH males (1,045.6). For Black females, combining the same four disorder categories with endocrine, nutritional, and metabolic diseases yielded a higher mortality rate (745.8) than the rate for all causes among WNH females (722.2). By 2019, all-cause mortality rates had declined significantly in all RE/sex groups, particularly among the non-WNH populations, but a sizable gap remained.[18] Age-adjusted mortality rates declined from 1999 to 2019 for most cause-of-death categories and RE/sex groups. Notable exceptions were external causes, for which death rates increased among all groups other than API females; and nervous system diseases and mental and behavioral disorders, for which death rates increased in all RE/sex groups.

Chart 8.
Age-adjusted mortality rates, by cause-of-death category, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Geographic Variation in All-Cause Mortality

Charts 4 and 5 showed the geographic variation in population density in the United States, as well as the heterogeneity in the distribution of different RE groups by state and county. Not surprisingly, U.S. mortality also varies geographically, whether it is across or within RE groups.

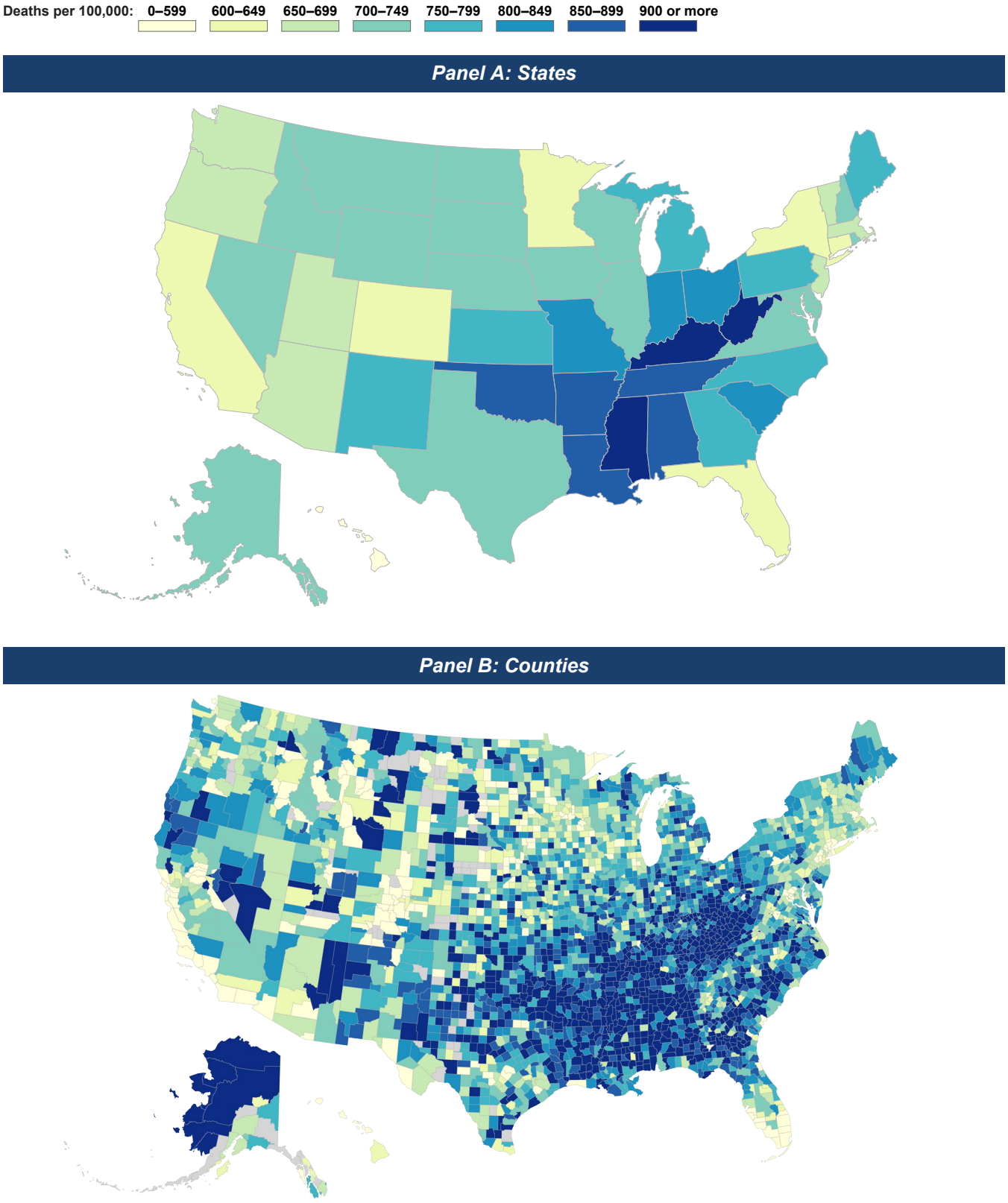
Chart 9 groups states and counties by all-cause age-adjusted mortality rates in 2019. Panel A shows that the states with the lowest all-cause mortality rates were Hawaii (573.3), California (601.8), New York (616.2), Colorado (647.8), Connecticut (648.7), Minnesota (649.2), and Florida (649.4). Additional states with an age-adjusted death rate below 700 include Massachusetts, New Jersey, Arizona, Washington, Vermont, Utah, and Oregon. At the other extreme, West Virginia had the highest mortality rate (945.4), followed by Mississippi (945.2), Kentucky (911.2), Alabama (897.8), Tennessee (882.7), Oklahoma (880.4), Arkansas (876.1), Louisiana (857.0), Ohio (827.1), Indiana (824.6), South Carolina (804.0), and Missouri (801.1). The highest mortality rates were observed in states located in parts of the South, the Ohio Valley and Appalachia, and some areas of the Midwest. Panel B shows that the overwhelming majority of the 827 counties with an age-adjusted all-cause mortality rate above 900 in 2019 were in the South. Most of these counties have low populations, with the notable exception of Baltimore City (MD), which has more than 500,000 residents and an age-adjusted mortality rate of 1,008.0. The other counties with a mortality rate over 1,000 and more than 100,000 residents were Potter County (TX), Robeson County (NC), Etowah County (AL), Madison County (MS), Florence County (SC), and Bibb County (GA). At the other end of the spectrum, there were 42 counties with death rates below 500 in 2019. Those with more than 100,000 residents were Arlington, Fairfax, and Loudoun Counties (VA); Collier County (FL); Marin, San Mateo, and Santa Clara Counties (CA); New York County (NY); and Montgomery County (MD).[19]

Chart 10 groups the states by age-adjusted mortality rate in 2019 for each of the four RE groups.[20] In most states, API residents had the lowest mortality rates, while Black residents had the highest. There are, however, some notable exceptions. For example, Hispanic individuals had the lowest mortality rates in West Virginia, Alabama, Maine, South Dakota, Kentucky, Mississippi, Arkansas, Georgia, Minnesota, Tennessee, Iowa, Oregon, and Louisiana. In Hawaii, the Hispanic population had a higher mortality rate than any other RE group, while Black residents had the lowest death rate. WNH individuals had higher mortality rates than Black residents in Idaho, Rhode Island, South Dakota, New Hampshire, Maine, Montana. Vermont, North Dakota, Wyoming, Massachusetts, Hawaii, New Mexico, and Utah. Finally, in Hawaii, the District of Columbia, Colorado, and New Mexico, the Hispanic population had a higher mortality rate than its WNH counterpart.

In 2019, the states with the highest age-adjusted mortality rates among the WNH population included West Virginia (955.6), Kentucky (922.1). Mississippi (920.6), and Alabama (890.7), while the states with the lowest mortality rates for the WNH group were the District of Columbia (364.7), Hawaii (575.5), New York (639.9), Alaska and Colorado (641.8), and Minnesota (642.5). For the Hispanic population, the mortality rate in 2019 was highest in Hawaii (953.2) and New Mexico (733.1) and lowest in West Virginia (239.8) and Alabama (303.0). The states with the highest mortality rates among Black residents were Wisconsin and Mississippi (1,012.0 and 1,009.9, respectively), and those with the lowest death rates were Idaho (428.4), South Dakota (496.9), New Hampshire (513.0), Rhode Island (518.0), and Hawaii (518.4). The states with the highest mortality rates among API individuals were Wyoming (581.6), Hawaii (564.2), Mississippi (503.0), Utah (493.6) and Arkansas (493.4), while the states with the lowest mortality rates among API people were New Hampshire (269.0), Connecticut (281.4), Delaware (285.3), New Jersey (318.9), and Massachusetts (319.8).

In terms of mortality differentials by RE group, the states with the widest Black-WNH gap in mortality rates included the District of Columbia (where Black mortality was 2.7 times higher), Wisconsin (1.4 times higher), and Illinois, Michigan, and Missouri (1.3 times higher). Other states where the Black-WNH mortality ratio exceeded 1.2 were Kansas, Nebraska, and Colorado. Mortality rates among WNH individuals were four times higher than those of the Hispanic population in West Virginia, and three times higher in Alabama. In addition, the ratio of WNH mortality rates to Hispanic mortality rates was 2 or greater in Kentucky, Mississippi, Arkansas, Maine, Tennessee, Georgia, South Dakota, Missouri, Maryland, and South Carolina. Mortality rates among the API community were lower than those of the WNH population in every state and the District of Columbia. The death rate for WNH people was at least twice that of API individuals in New Hampshire, Delaware, West Virginia, Indiana, Maine, Connecticut, Michigan, South Carolina, New Mexico, Alabama, New Jersey, Ohio, Kentucky, Tennessee, Missouri, Illinois, Texas, Massachusetts, Maryland, North Carolina, Virginia, Florida, and Georgia.

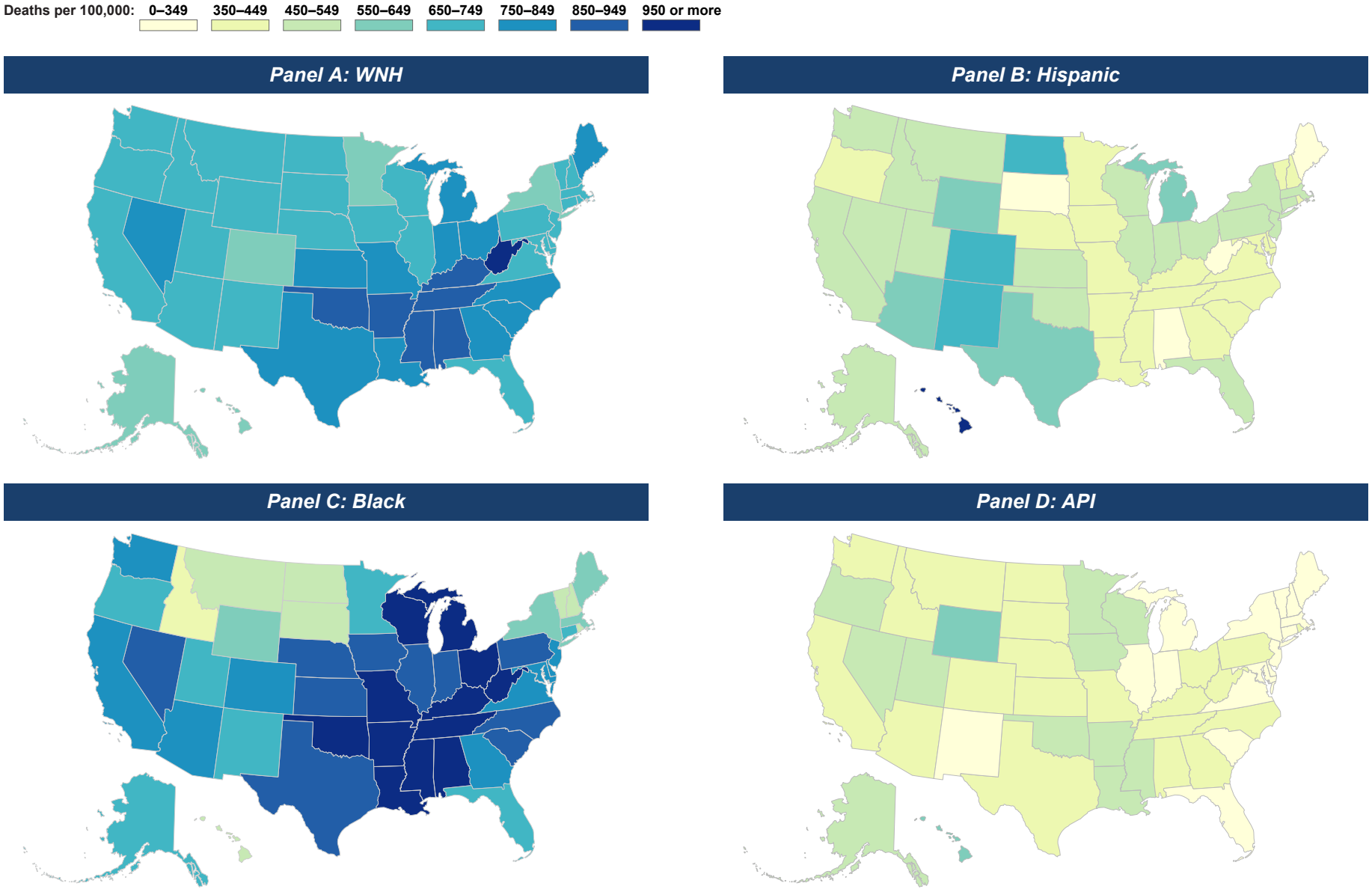
Chart 9.
States and counties by age-adjusted all-cause mortality rate, 2019



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Values for gray-shaded counties are missing, statistically unreliable, or suppressed to avoid disclosing information about particular individuals.

Chart 10.
States by age-adjusted all-cause mortality rate and RE group, 2019



SOURCE: Author's calculations based on CDC WONDER.

Diseases of the Circulatory System

In 2019, circulatory system diseases caused more deaths at ages 65 or older, and at all ages combined, than any other category. Among people aged 25–64, circulatory system diseases were the leading cause of death in the Black population, the second leading cause of death (after cancer) among the API and WNH communities, and the third leading cause of death for Hispanic individuals (after external causes and cancer). This section considers the 11 circulatory disease subcategories listed in Box 2.

Chart 11 shows the number and percentage distribution of circulatory system disease deaths by subcategory for 1999 and 2019, with detail by RE group and age. Ischemic heart disease was the leading cause of circulatory system disease–related death at ages 25–64, ages 65 or older, and all ages combined in 1999 and 2019. Ischemic heart disease reduces blood flow to the heart, preventing the heart muscle from receiving enough oxygen. It typically accounts for a higher share of circulatory system disease deaths in men than in women although that share declined

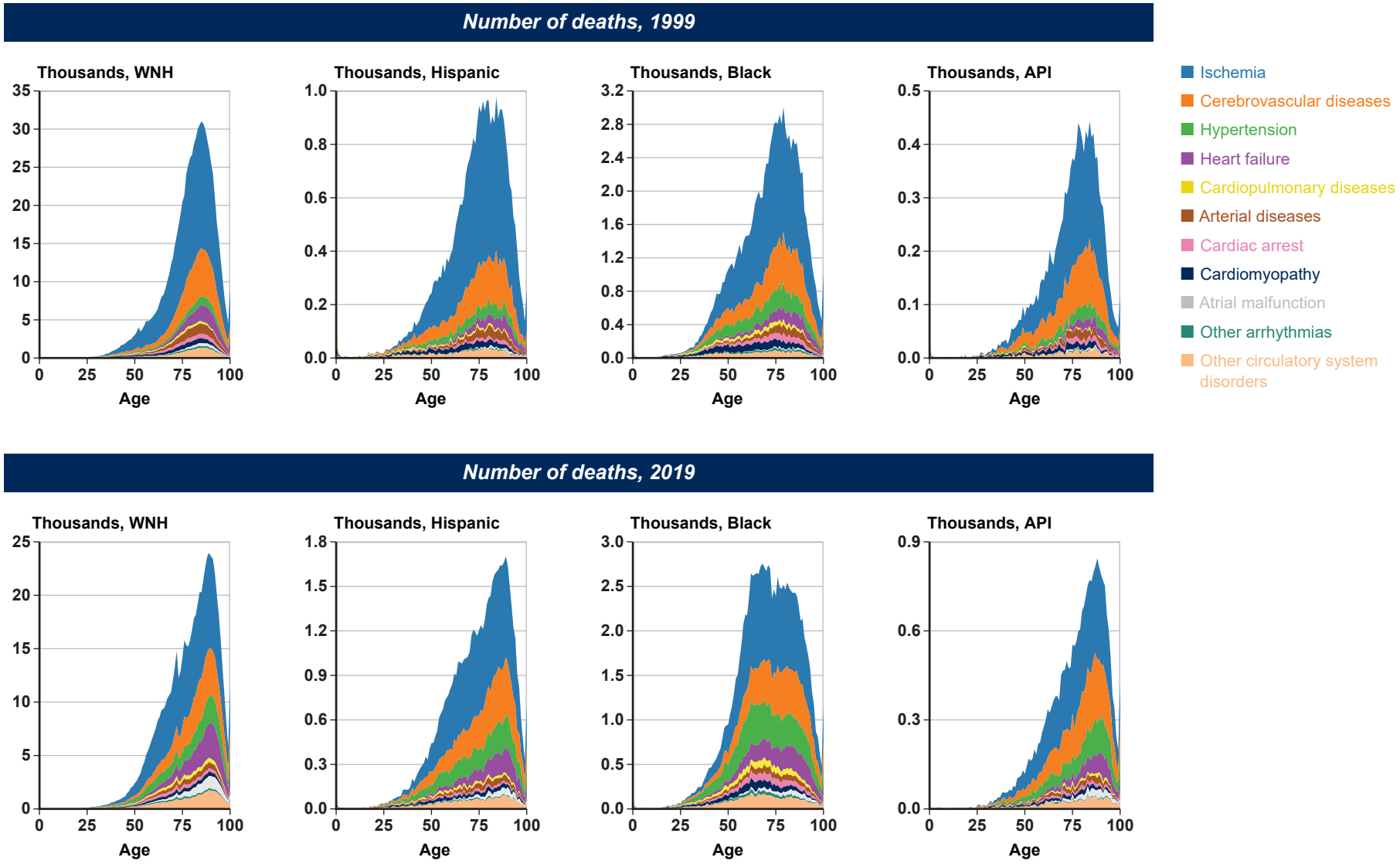
Box 2.
Circulatory system disease cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Ischemic heart diseases	Ischemia	I20–I25
Cerebrovascular diseases	Cerebrovascular diseases	I60–I69
Hypertensive diseases	Hypertension	I10–I16
Heart failure	Heart failure	I50
Pulmonary heart disease and diseases of pulmonary circulation	Cardiopulmonary diseases	I26–I28
Diseases of arteries, arterioles, and capillaries	Arterial diseases	I70–I78
Cardiac arrest	Cardiac arrest	I46
Cardiomyopathy	Cardiomyopathy	I42
Atrial fibrillation and flutter	Atrial malfunction	I48
Other cardiac arrhythmias	Other arrhythmias	I49
All other circulatory system disorders	Other circulatory system disorders	. . .
Acute rheumatic fever	. . .	I00–I02
Chronic rheumatic heart diseases	. . .	I05–I09
Acute pericarditis	. . .	I30
Other diseases of pericardium	. . .	I31
Pericarditis in diseases classified elsewhere	. . .	I32
Acute and subacute endocarditis	. . .	I33
Nonrheumatic mitral valve disorders	. . .	I34
Nonrheumatic aortic valve disorders	. . .	I35
Nonrheumatic tricuspid valve disorders	. . .	I36
Nonrheumatic pulmonary valve disorders	. . .	I37
Endocarditis, valve unspecified	. . .	I38
Endocarditis and heart valve disorder in diseases classified elsewhere	. . .	I39
Acute myocarditis	. . .	I40
Myocarditis in diseases classified elsewhere	. . .	I41
Cardiomyopathy in diseases classified elsewhere	. . .	I43
Atrioventricular and left bundle-branch block	. . .	I44
Other conduction disorders	. . .	I45
Paroxysmal tachycardia	. . .	I47
Complications and ill-defined descriptions of heart disease	. . .	I51
Other heart disorders in diseases classified elsewhere	. . .	I52
Diseases of veins, lymphatic vessels, and lymph nodes, not elsewhere classified	. . .	I80–I89
Other and unspecified disorders of the circulatory system	. . .	I95–I99

SOURCE: ICD-10.

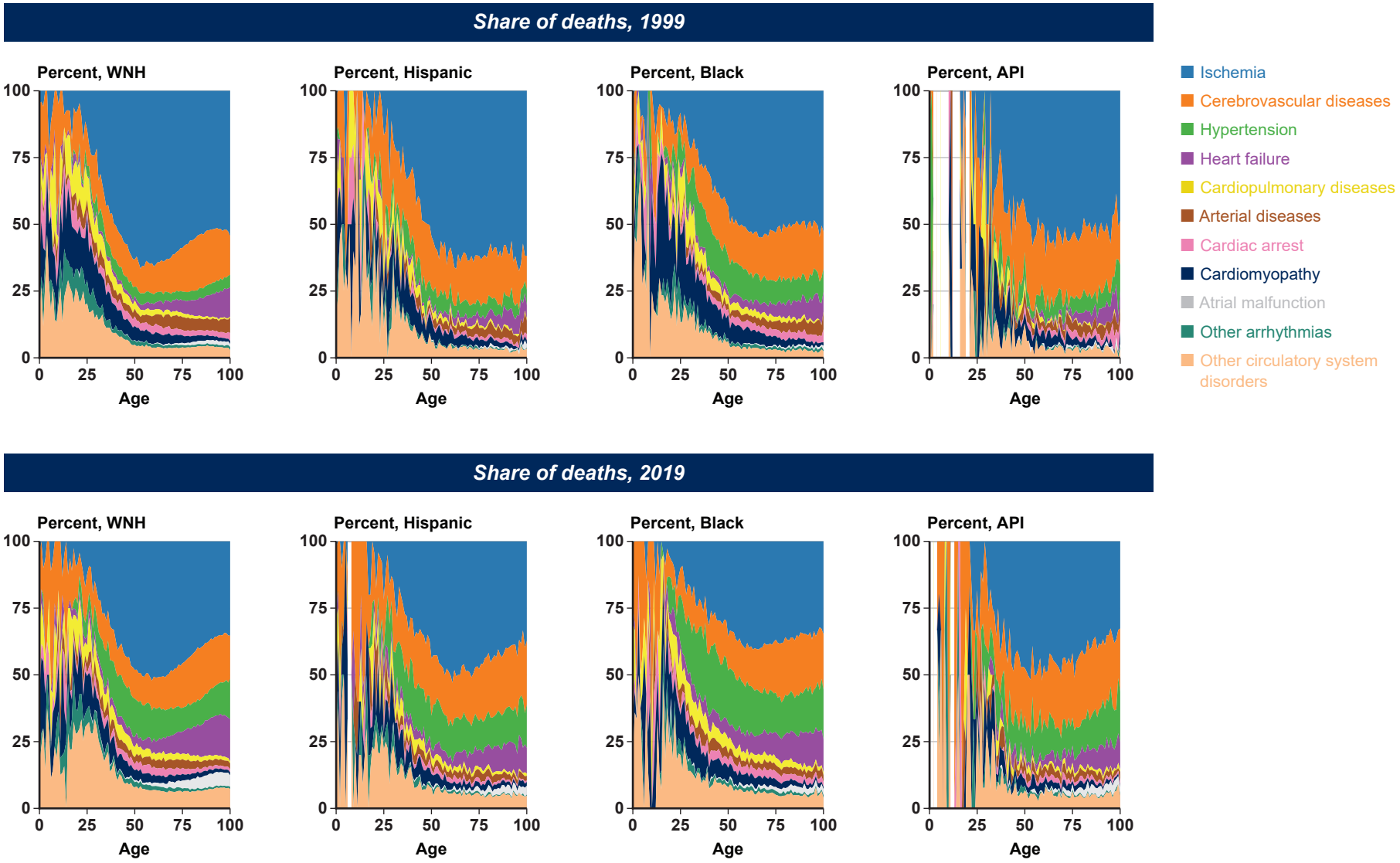
NOTE: . . . = not applicable.

Chart 11.
Circulatory system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019



(Continued)

Chart 11.
Circulatory system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*



SOURCE: Author's calculations based on CDC WONDER.

for both sexes over the observation period. Ischemia typically caused higher shares of circulatory system disease–related deaths for WNH and Hispanic people than for the other RE groups. In 1999, ischemic heart diseases respectively accounted for 56.2 percent and 49.4 percent of circulatory system disease deaths among the WNH and Black populations. By 2019, the percentages had declined to 41.9 percent among WNH individuals and 36.4 percent in the Black community.

Chart 12 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for circulatory system diseases overall.

Chart 12, Panel B shows that from 1999 to 2019, the all-ages ischemia death rate declined by more than half in every RE/sex group, with the mortality rates improving more rapidly in the first decade of the period than the second. In 2019, Black males had the highest all-ages ischemia mortality rate (134.2), followed by WNH and Hispanic males (125.0 and 91.4, respectively). Among females, the highest mortality rate was for those who are Black (75.4) and the lowest was for those who are API (35.5). The mortality gap between the Black and WNH populations narrowed considerably during the period, particularly at older ages. In fact, by 2017, the ischemia mortality rate of WNH men aged 65 or older surpassed that of Black men in that age group. In general, death rates improved more quickly for women than for men, resulting in a higher male-to-female mortality ratio over time.

Cerebrovascular disease refers to a variety of conditions affecting the supply of blood to the brain. It was the second leading cause of circulatory system–related deaths in 2019, accounting for 16.5 percent of those deaths among WNH people and 23.8 percent of those among the API community. The share of circulatory system–related deaths attributed to cerebrovascular disease changed little over the observation period and tended to be lower in the midlife years than at other ages. However, those shares were higher among women than men. For example, for WNH people in 2019, 13.4 percent of circulatory system–related deaths among men involved cerebrovascular disease, versus 19.9 percent among women.

Chart 12, Panel C shows that all-ages cerebrovascular disease mortality rates improved rapidly among all RE/sex groups from 1999 to 2012, then stalled. In 2019, the death rate was slightly higher than in 2012 for all groups except API males and WNH and API females. Black males and females had the highest mortality rates at all ages combined (55.4 and 46.9, respectively), as well as in every age group. WNH males and females and Hispanic males had similar all-ages mortality rates in 2019 (35.5, 35.1, and 35.3, respectively).

Hypertensive heart disease comprises heart conditions caused by high blood pressure. After a dramatic increase beginning in 1999, hypertensive heart disease accounted for the third largest share of circulatory system–related deaths in 2019, behind ischemia and cerebrovascular disease. The shares are also disproportionately high in the Black population. For example, from 1999 to 2019, the hypertension-related shares of circulatory system disease deaths rose from 3.7 percent to 10.7 percent among WNH individuals and from 9.8 percent to 16.6 percent in the Black population.

All-ages hypertensive disease mortality rates were higher in 2019 than in 1999 for all RE/sex groups except Black females (Chart 12, Panel D). The death rate for WNH males (12.7 in 1999) rose fastest, doubling to 25.7 by 2019. Black males and females had substantially higher mortality rates than other groups. In 1999, all-ages hypertension mortality rates for Black males and females (47.5 and 39.4, respectively), more than tripled those of their WNH counterparts, and the gap was even wider for the 25–64 age group. Hispanic males had higher all-ages mortality rates than WNH males until 2013. Hispanic females also experienced lower mortality rates than WNH females beginning in 2011. The gender mortality gap associated with hypertensive disease increased for every RE group (and almost every age group) over the 1999–2019 period, as mortality increased faster among males than females in each RE category.

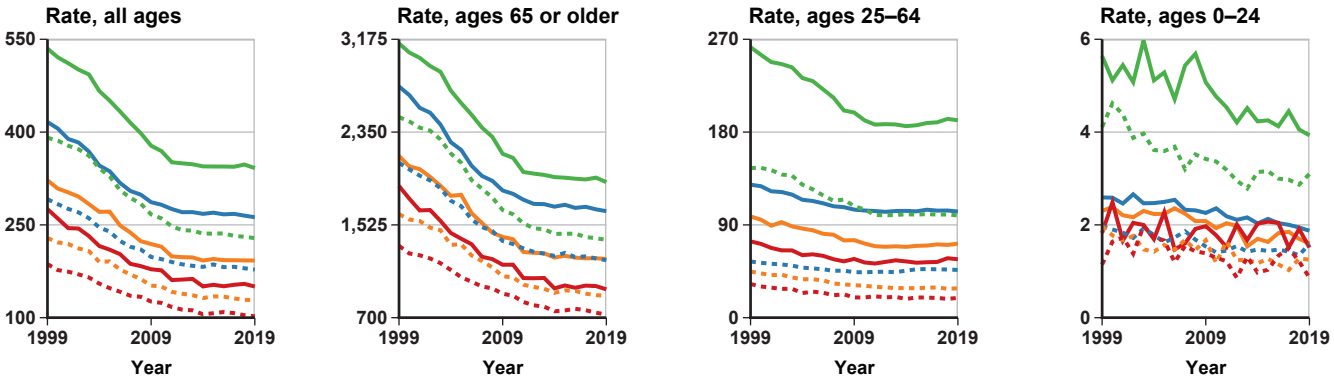
Heart failure is a chronic, progressive condition in which the heart is unable to pump enough blood to the organs. In 2019, heart failure was the fourth leading cause of circulatory system disease–related deaths in every RE group. Its share of all circulatory disorder–related deaths ranged from 8.7 percent for Black people to 10.4 percent for WNH people. The percentage of circulatory system–related deaths caused by heart failure increased over the observation period and was higher among the aged (65 or older) and the WNH and Black populations than the other age and RE groups.

For all RE/sex groups, all-ages heart failure death rates declined from 1999 to 2010 then increased thereafter (Chart 12, Panel E). By 2019, all-ages mortality rates were higher than they had been in 1999 for all RE groups other than API people. Black males had the highest heart failure mortality rate, followed by WNH males, Black females, and WNH females. Hispanic and API males and females experienced substantially lower rates. For example, in 2019, the

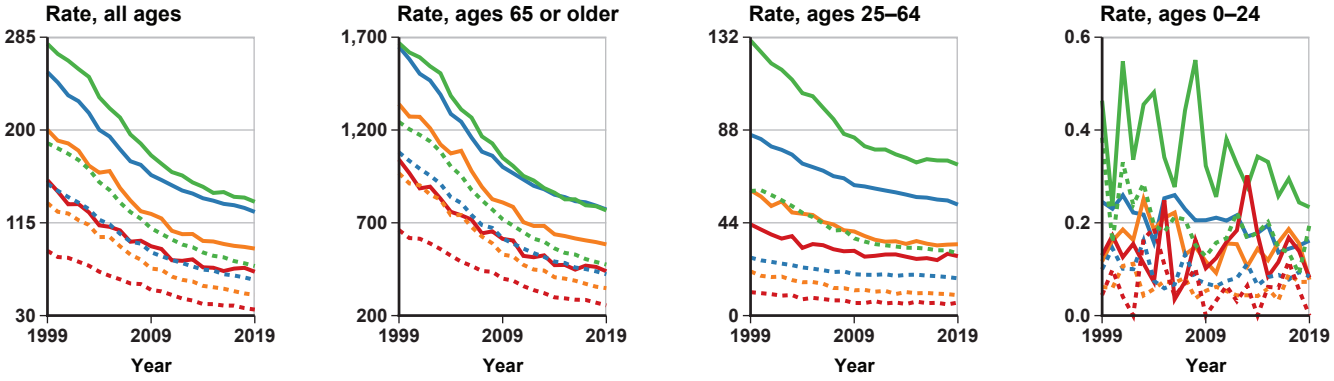
Chart 12.
Circulatory system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

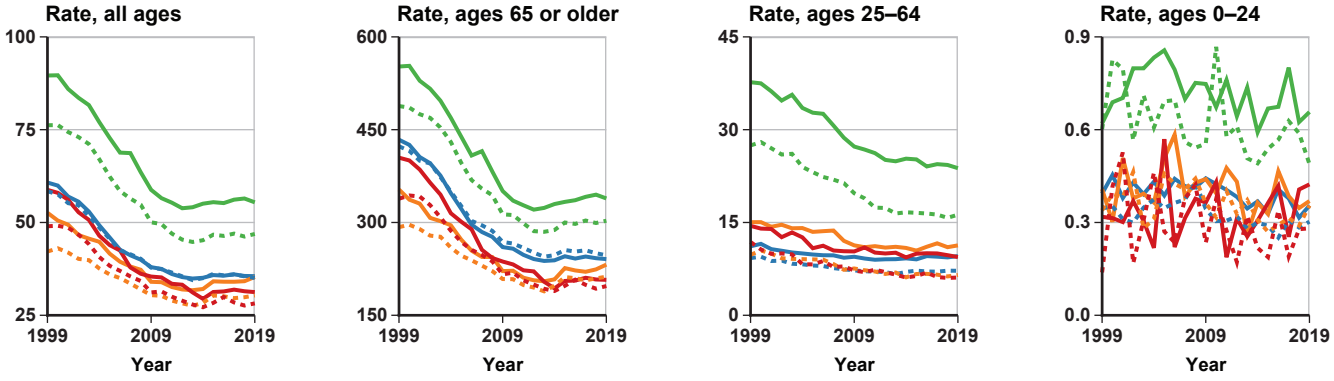
Panel A: All circulatory system diseases



Panel B: Ischemia



Panel C: Cerebrovascular diseases

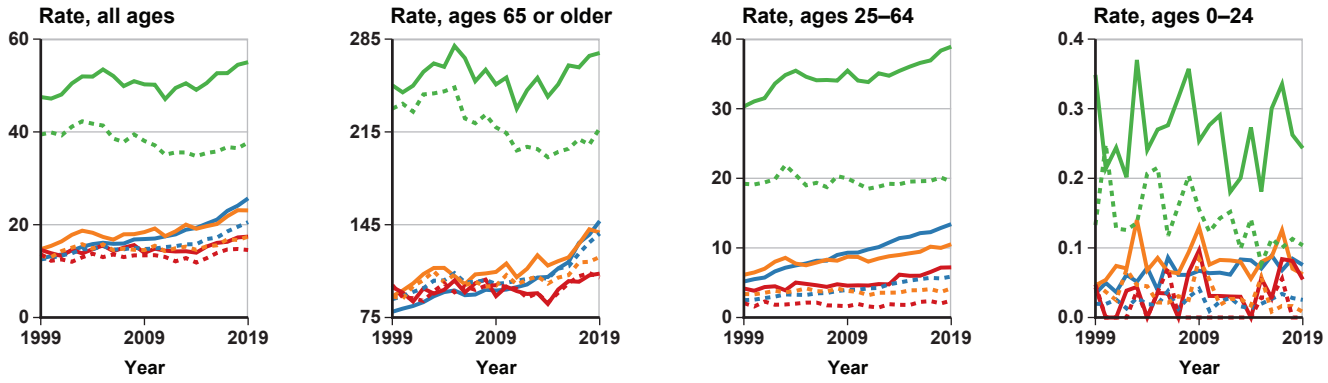


(Continued)

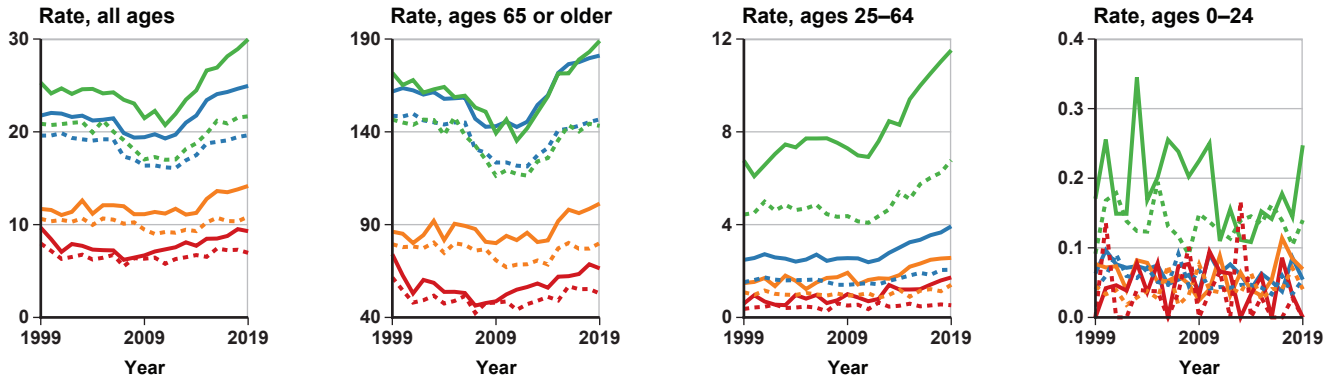
Chart 12.
Circulatory system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

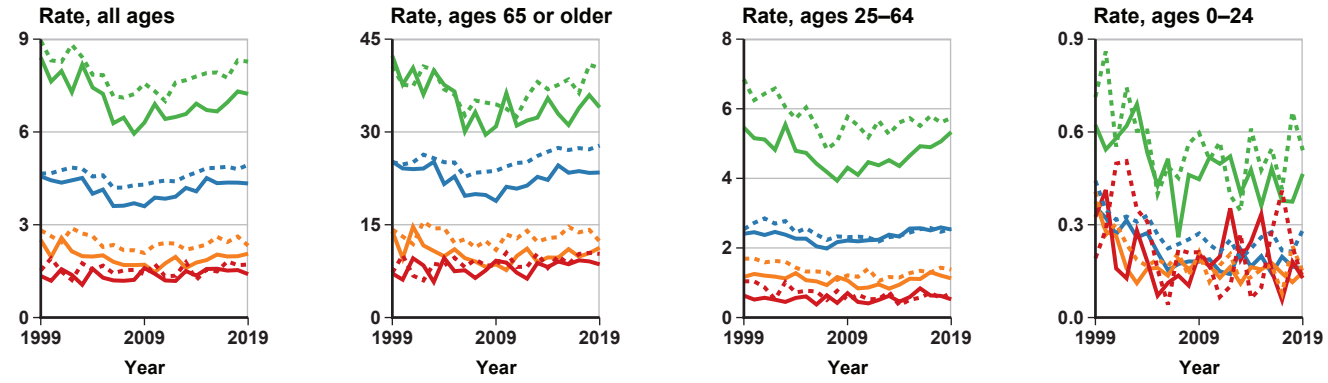
Panel D: Hypertension



Panel E: Heart failure



Panel F: Cardiopulmonary diseases

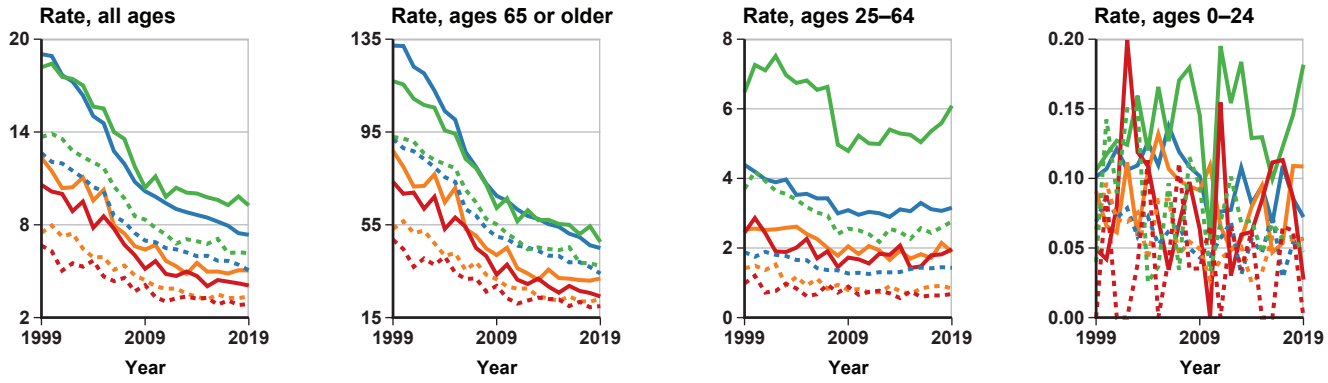


(Continued)

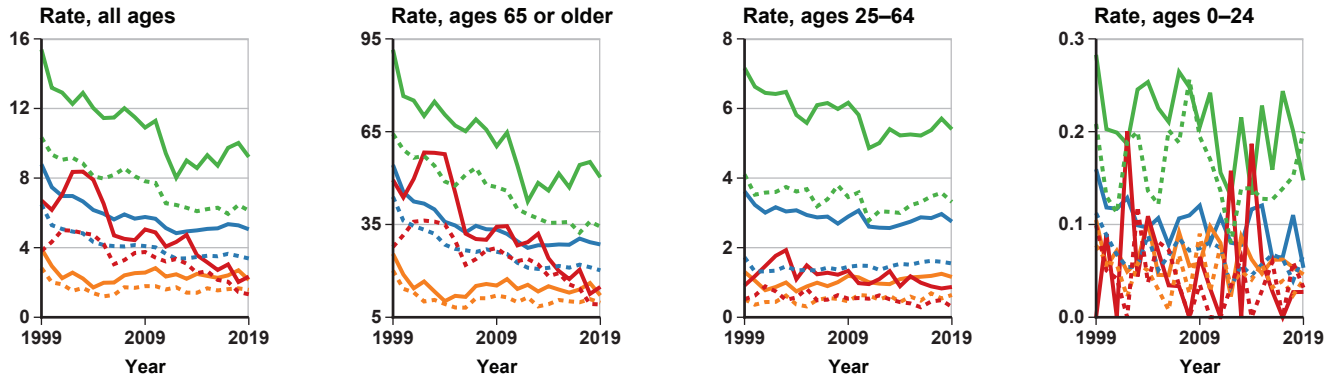
Chart 12.
Circulatory system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

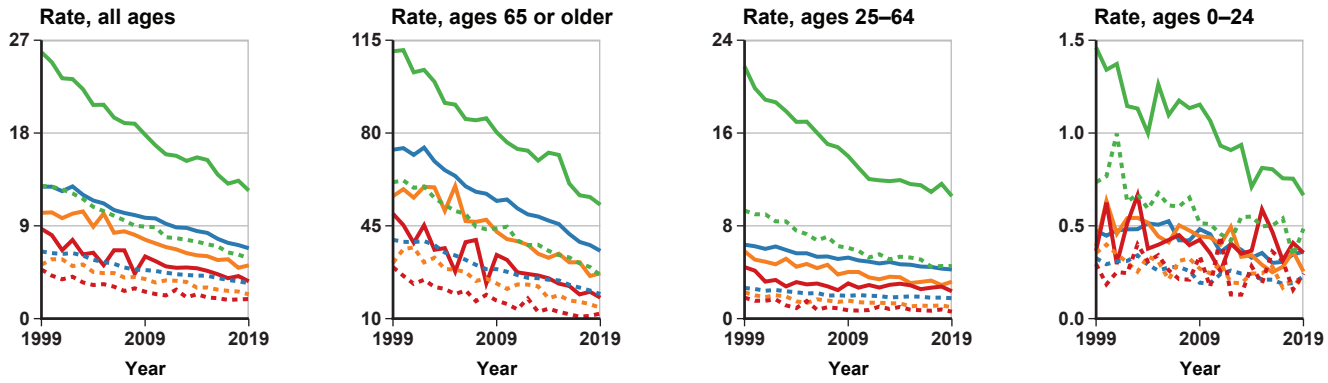
Panel G: Arterial diseases



Panel H: Cardiac arrest



Panel I: Cardiomyopathy

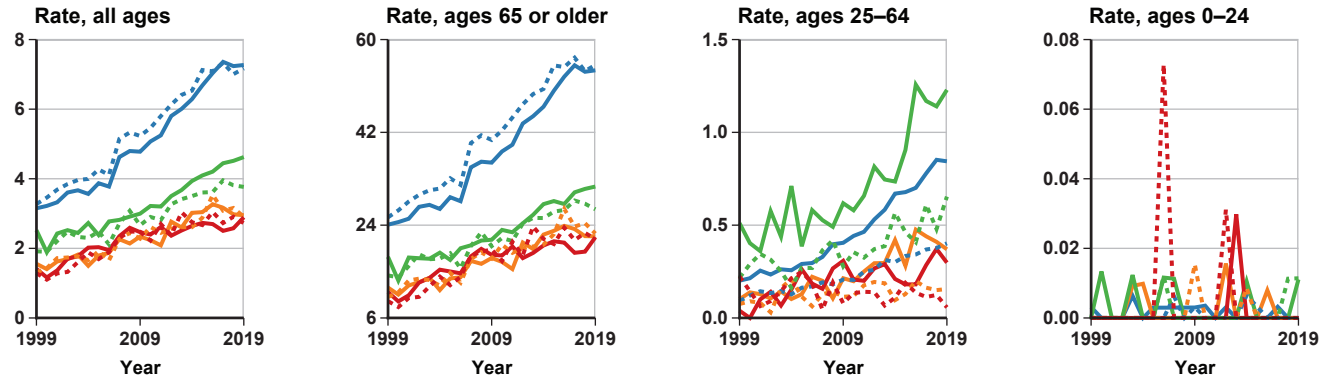


(Continued)

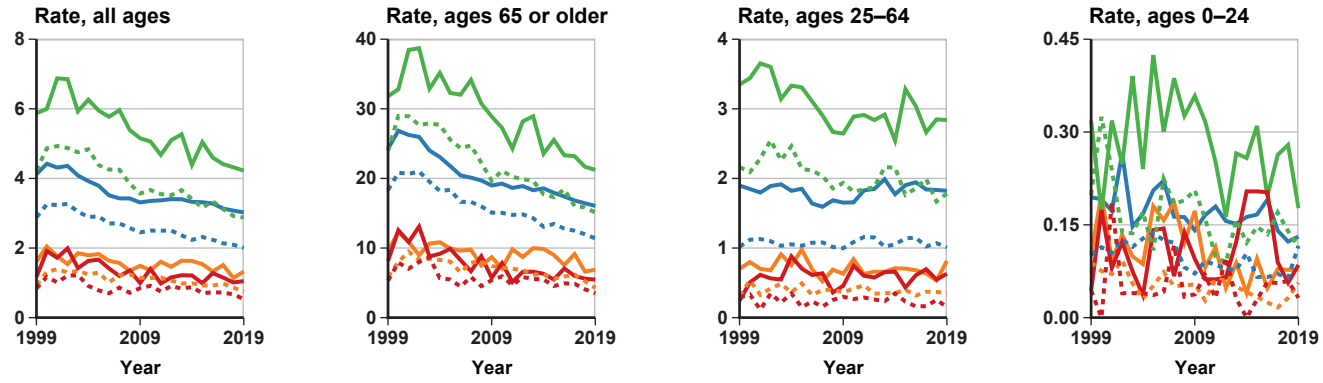
Chart 12.
Circulatory system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

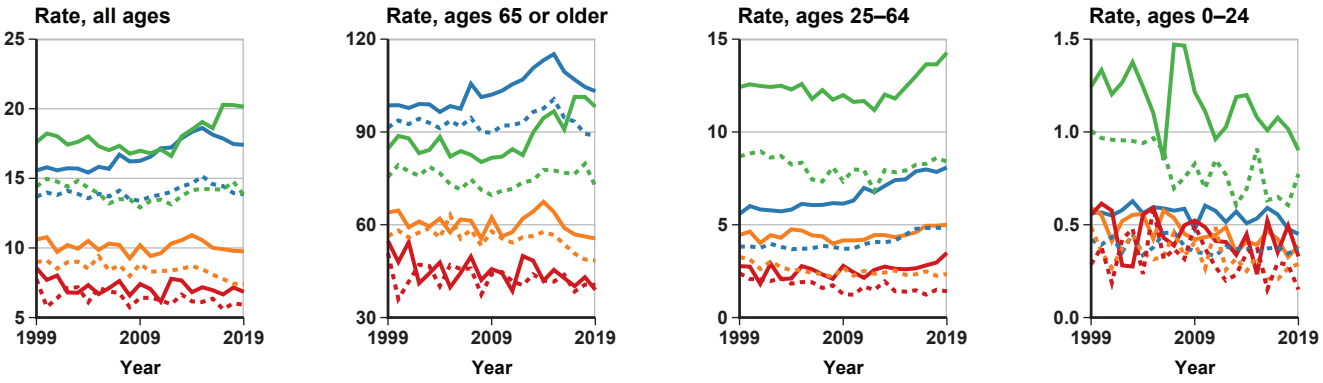
Panel J: Atrial malfunction



Panel K: Other arrhythmias



Panel L: Other circulatory system disorders



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

all-ages mortality rate from heart failure for each sex in the Black population was about twice as high as that of Hispanic individuals. From 1999 to 2019, heart failure mortality rates rose more for the midlife age group than for the aged, with Black men and women aged 25–64 exhibiting the highest mortality rates and API, Hispanic, and Black men experiencing the highest growth rates. At ages 65 or older, however, Black and WNH men had similar mortality rates in 2019 (189.0 and 181.1, respectively), as did Black and WNH women (143.2 and 146.7, respectively).

Pulmonary heart disease and diseases of pulmonary circulation involve severe dysfunction of the heart caused by lung disease. In 2019, the shares of circulatory system–related deaths caused by cardiopulmonary diseases ranged from 1.3 percent in the API population to 2.9 percent among Black people. The percentage of deaths is higher among females than males and increases substantially at younger ages, accounting for more than 10 percent of circulatory system–related deaths among those younger than 25.

For each RE group, the all-ages cardiopulmonary disease mortality rate was higher for females than males in 2019 (Chart 12, Panel F). From 1999 to 2010, mortality rates declined for all RE/sex groups; but for most groups, rates increased after 2010. Black females had the highest mortality rates, followed by Black males. In 2019, the mortality rates were more than 60 percent higher for Black males and females than for their WNH counterparts.

In 2019, diseases of the arteries, arterioles, and capillaries represented less than 3 percent of circulatory system–related deaths. The share of circulatory system–related deaths that was caused by arterial diseases declined over the observation period and tended to be slightly lower for those aged 65 or older than for the other age groups.

Chart 12, Panel G shows that from 1999 to 2019, all-ages arterial disease death rates declined by at least 49 percent in every RE/sex group. In 1999, WNH males had a higher all-ages mortality rate (19.0) than Black males (18.2). By 2019, Black males had the highest all-ages arterial disease mortality rate (9.2), followed by WNH males (7.4), Black females (6.2), WNH females (5.1), and Hispanic males (5.0). The steep decline in mortality attributed to arterial diseases was largely driven by mortality rate improvement at ages 65 or older.

Cardiac arrest is a sudden loss of heart function because of failure in the heart's electrical system. In 2019, the share of circulatory system–related deaths caused by cardiac arrest ranged from 1.3 percent for the Hispanic community to 2.7 percent among Black individuals.

From 1999 to 2019, cardiac arrest mortality rates improved substantially among all RE/sex groups (Chart 12, Panel H). In 2019, Black males had the highest all-ages mortality rate (9.2), followed by Black females (6.1) and WNH males (5.1). Through most of the period, Hispanic males and females experienced lower age-adjusted cardiac arrest mortality rates than those in the API community.

Cardiomyopathy refers to diseases of the heart that can cause the muscle to become enlarged, thick, or rigid. In 2019, across RE groups, cardiomyopathy accounted for 2–3 percent of circulatory system–related deaths at all ages combined. The cardiomyopathy share of circulatory system–related deaths is typically higher among men than women and in the Black community than for other RE groups. The percentage of circulatory system–related deaths associated with cardiomyopathy is higher at ages 25–64 than at older ages and is one of the leading causes of circulatory system–related deaths at younger ages. In 2019, cardiomyopathy accounted for about 16 percent of circulatory system disease deaths in the 0–24 age group for the WNH, Hispanic, and Black populations.

Cardiomyopathy mortality rates improved significantly over the 1999–2019 period among all population groups (Chart 12, Panel I). The all-ages death rate declined by nearly one-half for Hispanic males and WNH males and females, and by more than one-half for all other RE/sex groups. Nevertheless, cardiomyopathy mortality rates were substantially higher for Black males in all years than for any other RE/sex group. WNH males and Black females had either the second or third highest all-ages cardiomyopathy mortality rates over the observation period. In 1999, the all-ages cardiomyopathy mortality rate for Black males more than doubled that of WNH men (25.8 versus 12.8). By 2019, the gap had narrowed slightly, to a factor of 1.8 (12.4 versus 6.8). The mortality-rate gap between Black and WNH females also narrowed during this period. At ages 25–64, Black women had the second highest cardiomyopathy mortality rate after Black men. At ages 65 or older, the mortality rates of Black women and Hispanic men were similar; WNH women and API men also had similar mortality rates.

Atrial fibrillation and atrial flutter result from electrical discharge patterns that cause the heart's

two upper chambers (the atria) to beat irregularly and out of coordination with the two lower chambers (the ventricles). In 1999, this was one of the least common causes of circulatory system–related deaths, accounting for about 0.5 percent of such deaths among Hispanic, Black, and API people and a little less than 1.0 percent of such deaths among WNH people. The share of deaths attributed to atrial malfunction increased rapidly thereafter, reaching 3.5 percent of circulatory system–related deaths in the WNH population in 2019. The percentage of circulatory system–related deaths that is caused by atrial malfunction tends to be higher among women than men and at older ages than in midlife. It is also disproportionately higher for WNH individuals than for other RE groups.

All-ages atrial malfunction death rates increased by 80 percent or more for all RE/sex groups from 1999 to 2019, and more than doubled for all but Black and Hispanic males and Black females (Chart 12, Panel J). WNH females and males respectively had the highest and second highest all-ages atrial malfunction mortality rates from 1999 until 2017, when the rate for males surpassed that of females. Black males had the third highest all-ages atrial malfunction mortality rates and Black females had the fourth highest rates each year except 2000, 2005, and 2008, when the rankings were switched. In 2019, the all-ages death rates among WNH and Black males were 7.3 and 4.6, respectively. The corresponding rates for females were 7.2 and 3.8.

The subcategory of circulatory system disorders designated as "other cardiac arrhythmias" accounted for little more than 1 percent of circulatory system–related deaths in the WNH and Black populations and smaller shares in the other RE groups in 2019. The shares of circulatory system–related deaths attributable to other arrhythmias were highest at ages 0–24 (for example, 7.4 percent in the WNH population) and declined as age increased.

All-ages other-arrhythmia mortality rates generally declined among all RE/sex groups in the 1999–2019 period (Chart 12, Panel K). Black males had the highest all-ages other-arrhythmia mortality rates throughout the period. Black females had the second highest rate until 2017, when it was surpassed by the rate for WNH males.

The final subcategory comprises all other circulatory system disorders. It includes a variety of diseases affecting the heart's valves and membranes, rheumatic heart disease, and diseases of the veins, lymphatic vessels, and lymph nodes. In 2019, the percentage of circulatory system–related deaths attributed to this subcategory at all ages ranged from 5.2 percent in the API community to 7.0 percent among WNH individuals (Chart 11). This subcategory accounts for a greater share of deaths at ages 25–64 than at ages 65 or older and it also represents the leading cause of circulatory system–related death among the young, constituting almost one-quarter of such deaths for the WNH, Hispanic, and Black populations at ages 0–24.

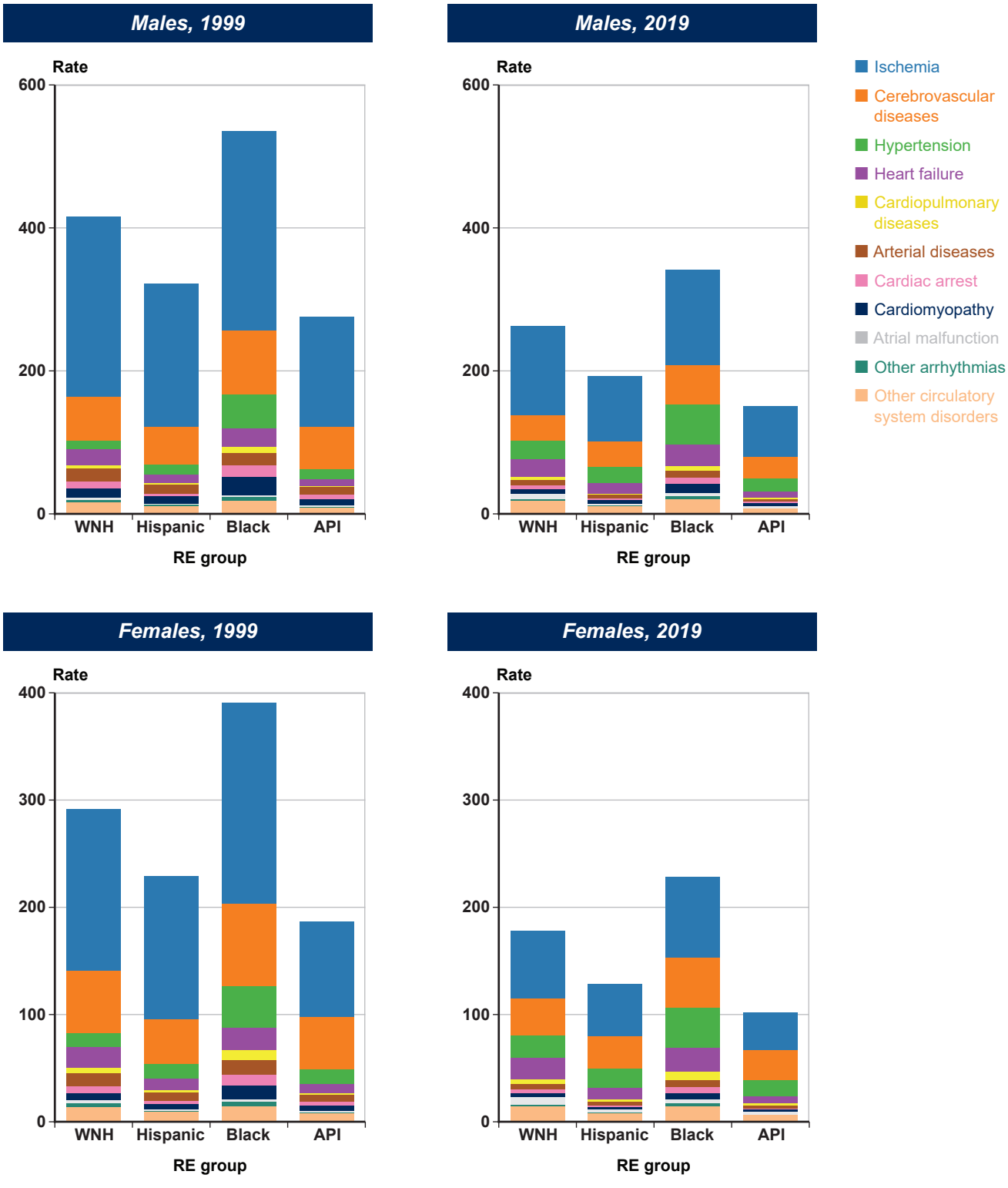
Black males had the highest all-ages mortality rate from other circulatory system disorders, followed by WNH males (Chart 12, Panel L). Black and WNH females had similar all-ages death rates in 2019 (13.8 and 13.9, respectively). At older ages, however, WNH people typically experienced higher mortality rates than did those in other RE groups. The all-ages other-circulatory-disorder death rates were higher in 2019 than in 1999 only among WNH males and females and Black males.

In summary, from 1999 to 2019, mortality caused by diseases of the circulatory system declined among all RE/sex groups, with much of the improvement taking place in the first decade of the period. The substantial decline in mortality caused by ischemic heart disease and cerebrovascular disease throughout the 2000s more than offset the increased mortality from other causes, such as hypertensive heart disease and heart failure, beginning in 2010. Chart 13 summarizes the contribution of each cause-of-death subcategory to the overall age-adjusted circulatory-system disease mortality rate in 1999 and 2019.

The racial disparities in circulatory system disease mortality can be understood in terms of the subcategory components the chart highlights. For instance, in 1999, the all-ages mortality rate from ischemic heart disease among Black males (278.9) exceeded the combined circulatory system disease death rate for API males (275.6). Further, the combined mortality caused by ischemic heart disease and hypertensive heart disease among Black males (326.4) was higher than the death rate from all circulatory system diseases among Hispanic men (322.1). For WNH men in 1999, combined mortality from three causes (ischemic, cerebrovascular, and hypertensive heart diseases) also exceeded that of Hispanic males from all circulatory system–related diseases (326.5 versus 322.1).

Over time, the mortality rates among all RE/sex groups declined and the mortality rate gaps between the groups narrowed. For instance, in 1999, 118.7 more Black males per 100,000 population died of circulatory system diseases than did WNH males. By 2019, the number declined to 79.4 additional deaths per

Chart 13.
Circulatory system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

100,000. However, if the racial gap is defined as the ratio between two age-adjusted mortality rates, then it increased in most cases. This is because API males and females had the highest rates of mortality decline over the 1999–2019 period, followed by Hispanic males and females. Circulatory system–related mortality for WNH and Black males declined at similar rates. Only Black females experienced a modest reduction in the mortality gap with WNH females, as the mortality ratio decreased from 1.34 in 1999 to 1.29 in 2019. Black males had the highest age-adjusted mortality rates in nine of the eleven circulatory system disease subcategories (the exceptions, atrial fibrillation and pulmonary heart disease, are among the less prevalent causes). Black females often had either the second highest mortality rate or the third highest rate (after Black and WNH males).

Neoplasms

In 2019, neoplasms (cancers) were the second most common cause of death after circulatory system diseases, accounting for at least one-fifth of all deaths. This section examines the 15 neoplastic disease subcategories listed in Box 3.

Chart 14 shows the number and percentage distribution of cancer deaths by subcategory in 1999 and 2019, with detail by RE group and age. The composition of cancer deaths among males and females differs substantially (not shown). For females at all ages, breast cancer is a leading cause of cancer deaths. For males, however, breast cancer is a negligible subcategory. For instance, in 2019, breast cancer caused 467 deaths among men and 42,281 deaths among women. Moreover, although neoplasms of the genital organs represent a sizable subcategory of neoplastic mortality among males, prostate cancer typically develops slowly and has a much later age of onset than cervical, uterine, and ovarian cancers. As a result, among people aged 25–64, neoplasms of the genital organs account for a significantly larger share of cancer deaths in women than men, while the opposite is true at older ages. For example, cancer of the genital organs in 2019 accounted for 19.0 percent and 12.6 percent of all cancer deaths, respectively, among Black men and women aged 65 or older. At ages 25–64, however, this cause accounted for 7.9 percent of cancer deaths in Black men, but 14.7 percent among Black women.

At ages 0–24, the three subcategories that accounted for the highest shares of cancer deaths were neoplasms of lymphoid, hematopoietic, and related tissue (such as leukemia and lymphoma); neoplasms of the eye, brain, and other parts of the central nervous system; and the residual "all other cancers" subcategory. In 2019, neoplasms of lymphoid, hematopoietic, and related tissue caused almost one-third of cancer deaths among Hispanic individuals aged 0–24 and about one-quarter of cancer deaths at those ages in the other RE groups. The shares of cancer deaths at ages 0–24 that were caused by neoplasms of the eye, brain, and nervous system ranged from 19.2 percent in the Hispanic population to 24.9 percent among WNH individuals in 2019. Also in 2019, the shares of neoplasm deaths at ages 0–24 that were attributed to the "all other cancers" subcategory ranged from 28.9 percent among Hispanic people to 36.7 percent in the API community.

At ages 65 or older, neoplasms of the organs of the respiratory system (lung cancers) were the leading cause of cancer deaths in every RE group and both sexes. At ages 25–64, breast cancer was the leading cause of neoplasm death in 2019 for Black, Hispanic, and API women; but for WNH women, lung cancer caused a higher percentage of cancer deaths. Cancers of the genital organs were the second leading cause of neoplastic death at ages 25–64 for API and Hispanic women and the third leading cause of cancer death among Black and WNH women. Neoplasms of the liver were the second leading cause of cancer death among API and Hispanic men aged 25–64. Several cancer subcategories encompass one or more of the components of the digestive system, such as neoplasms of the liver and intrahepatic bile ducts, neoplasms of the pancreas, and neoplasms of the colon. Another of these subcategories comprises neoplasms of "other organs of the digestive system" (which include the esophagus, stomach, small intestine, rectum, and gallbladder), and this subcategory represented the leading cause of cancer death at ages 25–64 among Hispanic men, the second leading cause among WNH and Black men, and the third leading cause among API men.

The distribution by type in cancer-related deaths varied significantly by RE group. The shares of cancer deaths that were caused by neoplasms of respiratory and intrathoracic organs were greater among WNH and Black individuals than for other RE groups. The Black community experienced higher percentages of neoplastic deaths from cancers of the genital organs and breast cancer than other RE groups. Relative to other RE groups, the Hispanic community tended to have a higher proportion of cancer deaths that were caused by neoplasms of lymphoid, hematopoietic, and related tissue, and the API and Hispanic populations experienced higher percentages of cancer deaths from

neoplasms of the liver and intrahepatic bile ducts and cancers associated with other organs of the digestive system. Neoplasms of the eye, brain, and other parts of the central nervous system and neoplasms of the urinary tract accounted for higher proportions of cancer deaths for the WNH and Hispanic populations than for other RE groups.

Chart 15 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for neoplasms overall.

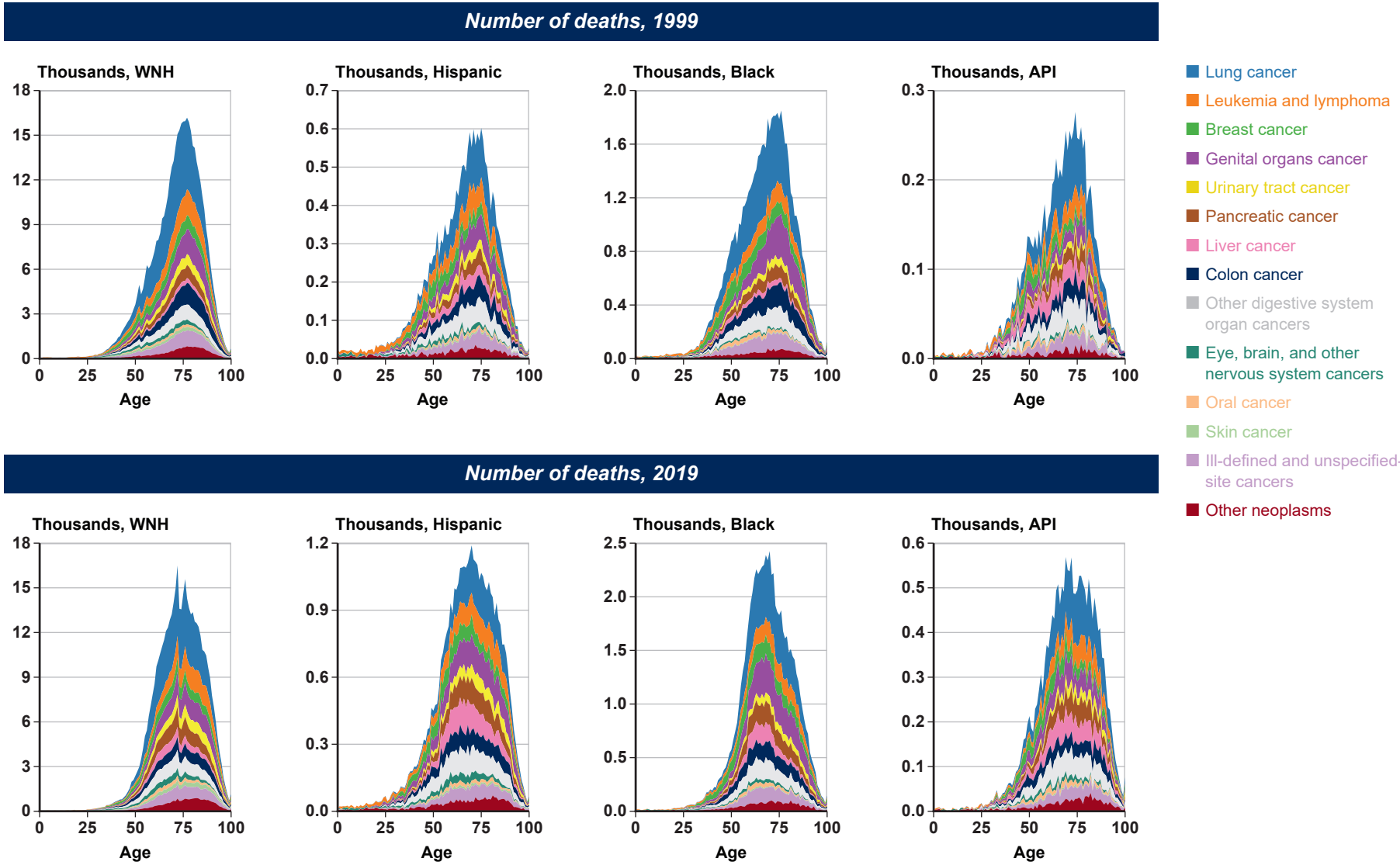
Neoplasms of respiratory and intrathoracic organs (lung cancers for brevity) were the leading cause of cancer death at all ages. Across RE groups in 2019, the shares of cancer death caused by lung cancers ranged from 13.6 percent among Hispanic people to 24.8 percent for WNH people. The share of neoplastic deaths attributable to lung cancers was lower in 2019 than it had been in 1999. That share typically increases with age until ages 65–75, then declines as other types of cancer contribute a greater percentage of deaths.

Box 3.
Neoplasm cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Neoplasms of the—		
Respiratory and intrathoracic organs	Lung cancer	C30–C39
Lymphoid, hematopoietic, and related tissue	Leukemia and lymphoma	C81–C96
Breast	Breast cancer	C50
Genital organs (male)	Prostate cancer	C60–C63
Genital organs (female)	Cervical, uterine, and ovarian cancer	C51–C58
Urinary tract	Urinary tract cancer	C64–C68
Pancreas	Pancreatic cancer	C25
Liver and intrahepatic bile ducts	Liver cancer	C22
Colon	Colon cancer	C18
Other organs of the digestive system	Other digestive system organ cancers	. . .
Esophagus	. . .	C15
Stomach	. . .	C16
Small intestine	. . .	C17
Rectosigmoid junction	. . .	C19
Rectum	. . .	C20
Anus and anal canal	. . .	C21
Gallbladder	. . .	C23
Other and unspecified parts of the biliary tract	. . .	C24
Other and ill-defined digestive organs	. . .	C26
Eye, brain, and other parts of the central nervous system	Eye, brain, and other nervous system cancers	C69–C72
Lip, oral cavity, and pharynx	Oral cancer	C00–C14
Skin	Skin cancer	C43–C44
Ill-defined, other secondary, and unspecified sites	Ill-defined and unspecified-site cancer	C76–C80
All other neoplasms	Other cancers	. . .
Neoplasms of—	. . .	. . .
Thyroid and other endocrine glands	. . .	C73–C75
Bone and articular cartilage	. . .	C40–C41
Mesothelial and soft tissue	. . .	C45–C49
Independent (primary) multiple sites	. . .	C97
Uncertain or unknown behavior	. . .	D37–D48
In situ neoplasms	. . .	D00–D09
Benign neoplasms	. . .	D10–D36

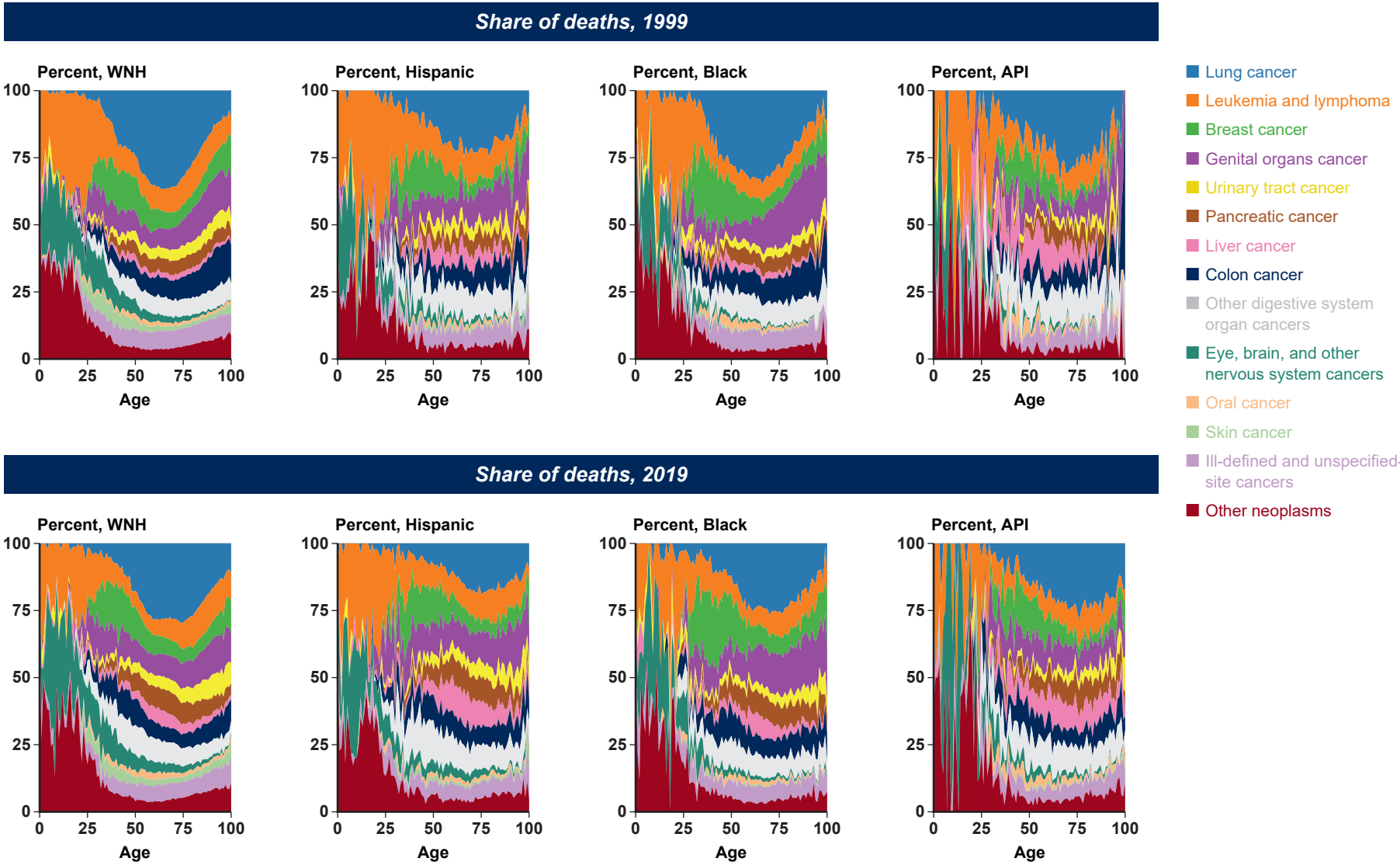
SOURCE: ICD-10.
NOTE: . . . = not applicable.

Chart 14.
Neoplasms: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019



(Continued)

Chart 14.
Neoplasms: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*

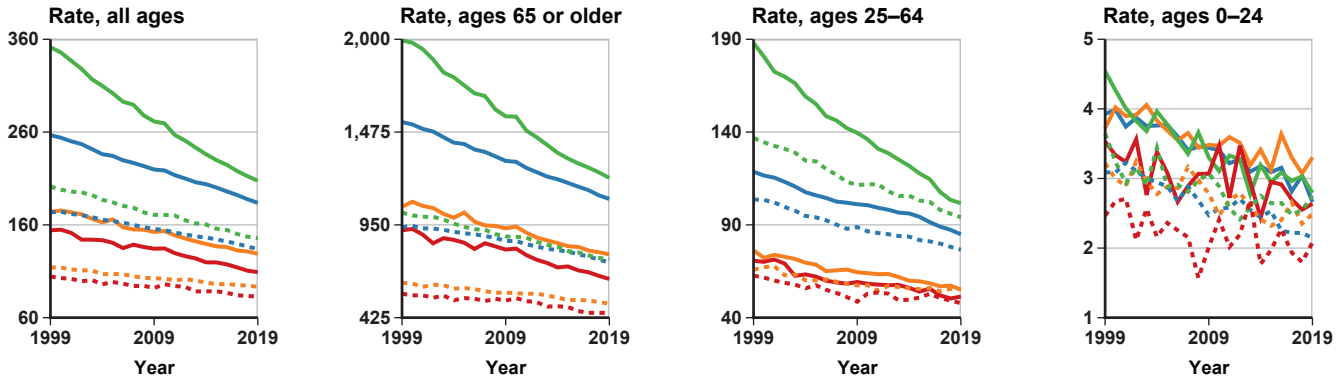


SOURCE: Author's calculations based on CDC WONDER.

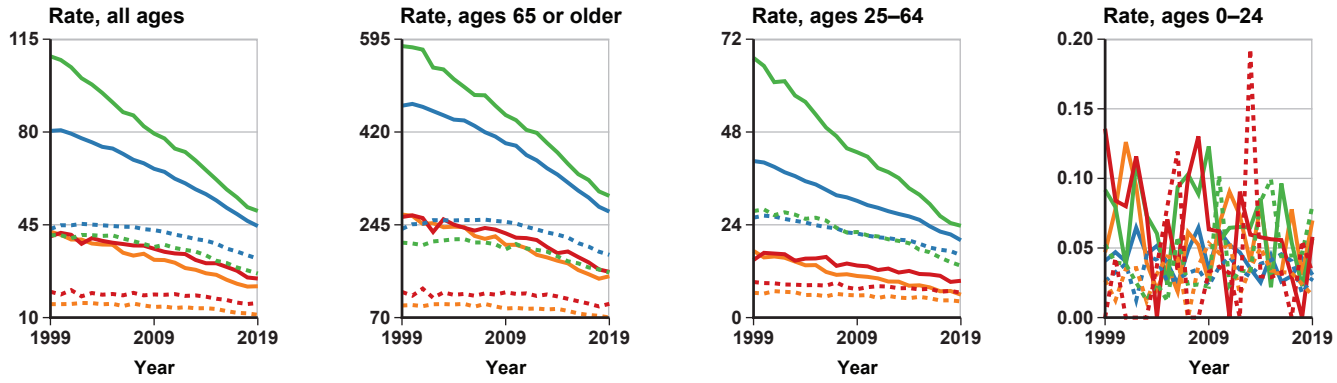
Chart 15.
Neoplasms: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel A: All neoplasms



Panel B: Lung cancer



Panel C: Leukemia and lymphoma

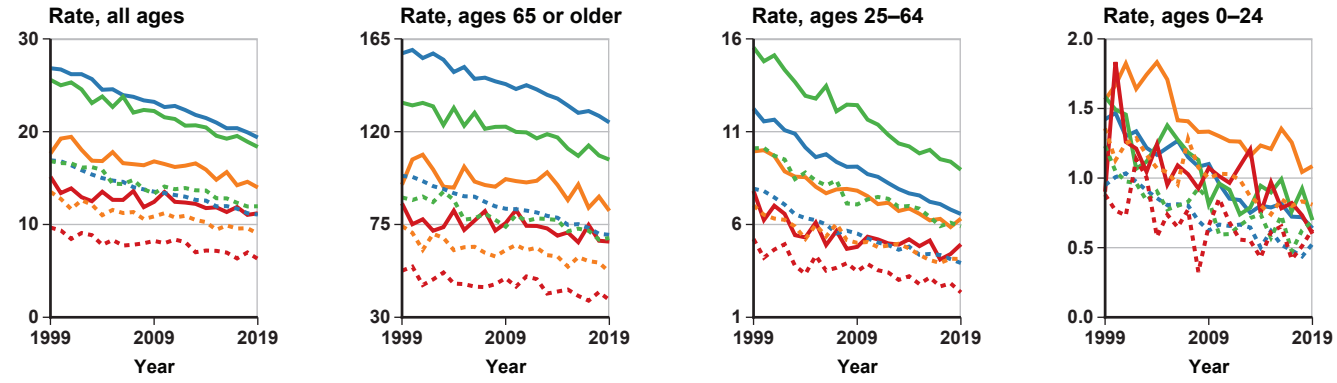


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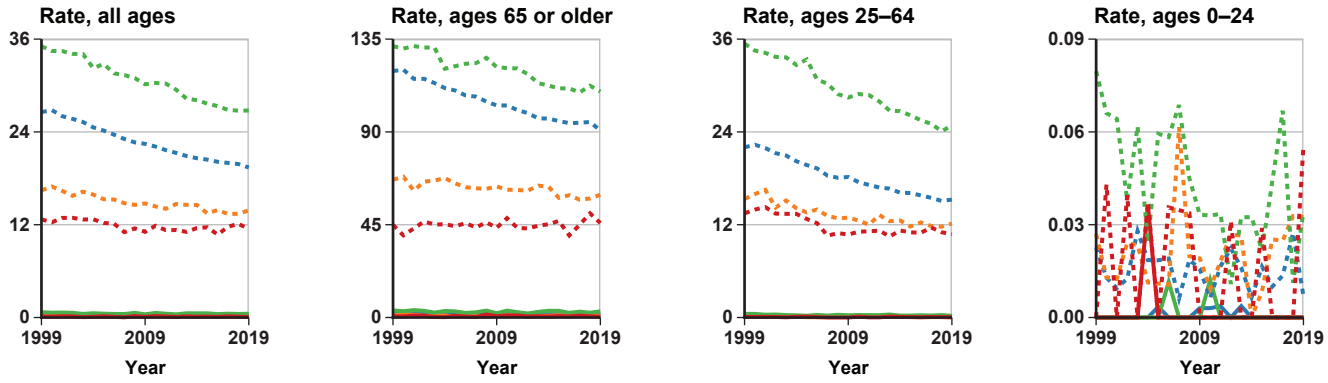
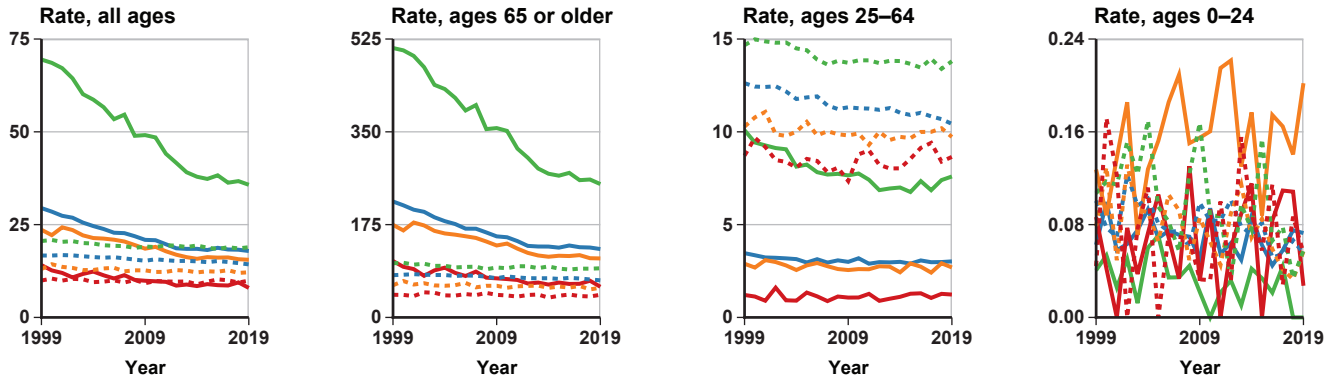
Chart 15.
Neoplasms: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel D: Breast cancer



Panel E: Genital organs cancer



Panel F: Urinary tract cancer

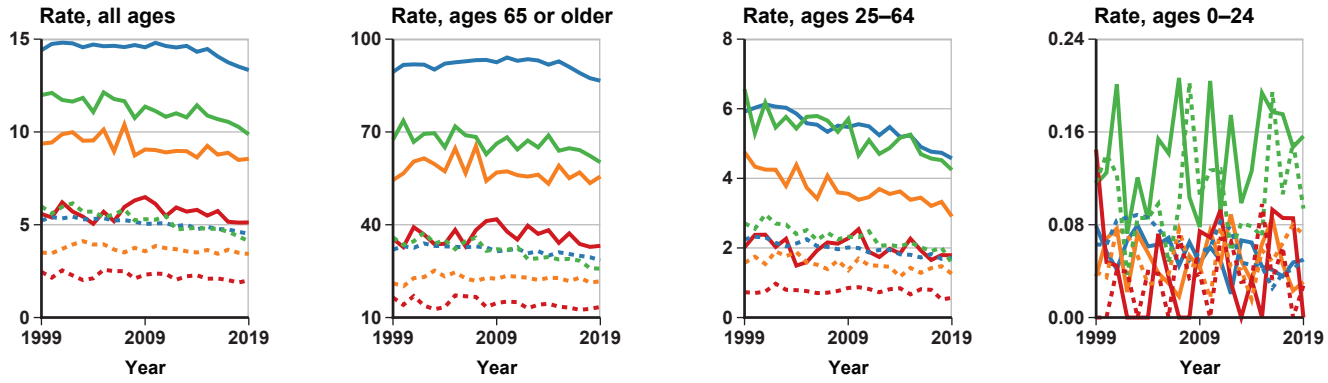


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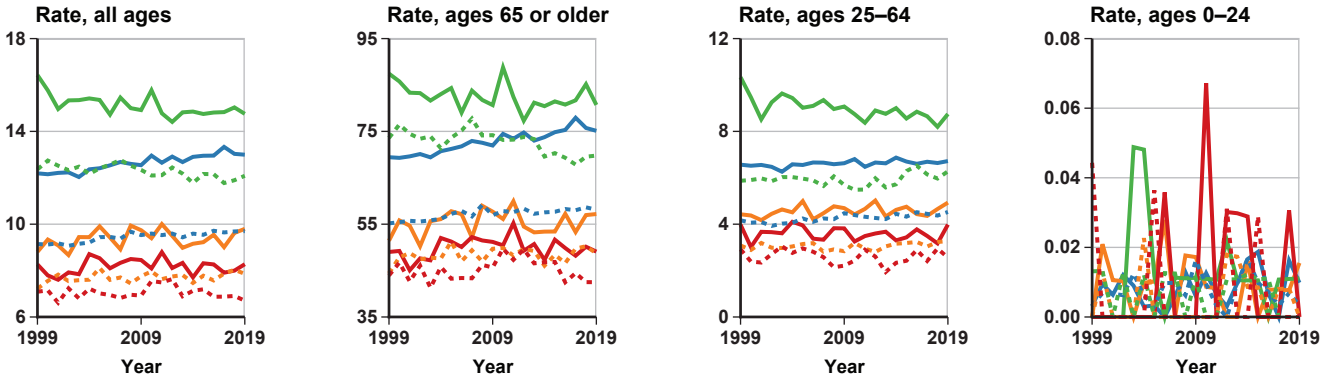
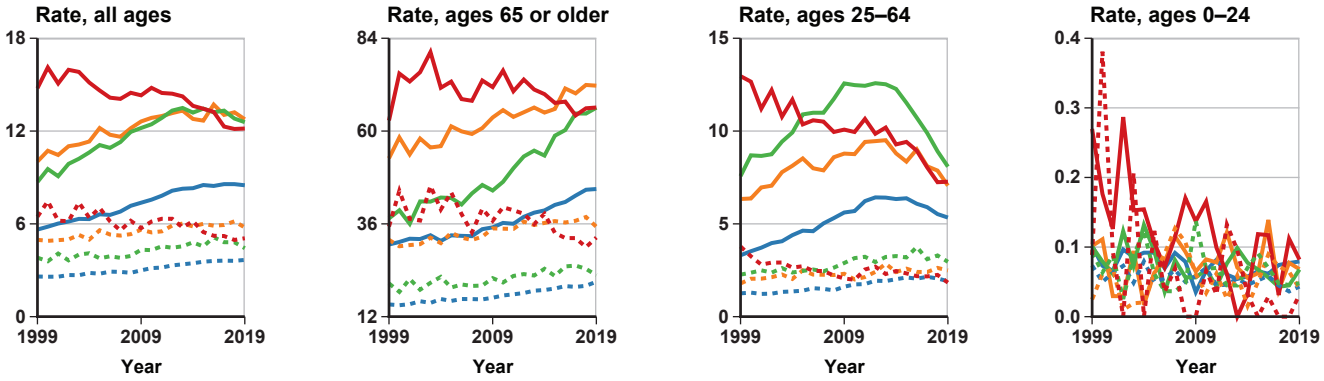
Chart 15.
Neoplasms: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

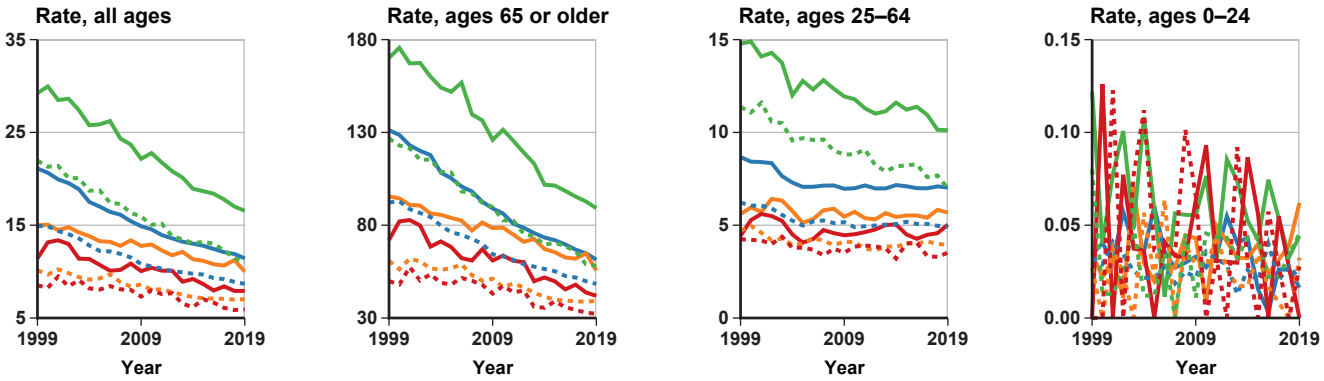
Panel G: Pancreatic cancer



Panel H: Liver cancer



Panel I: Colon cancer

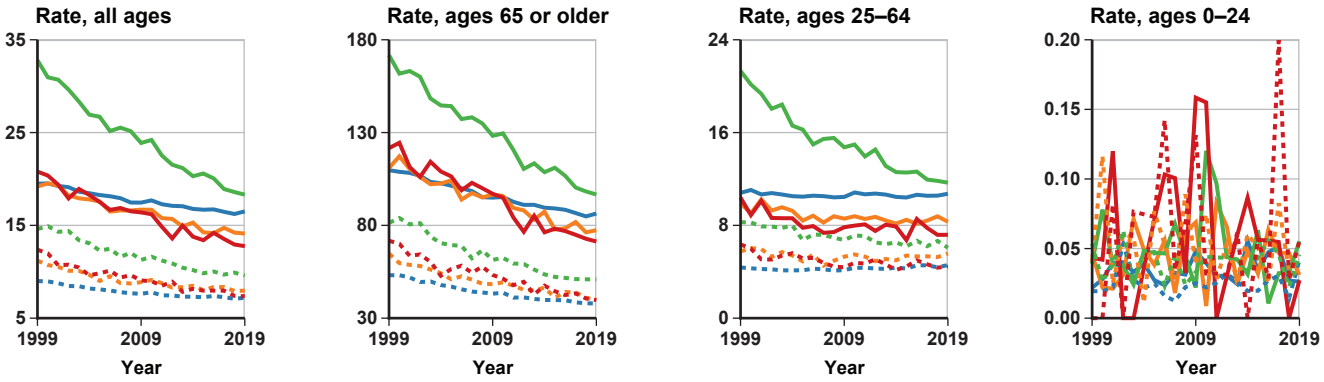


(Continued)

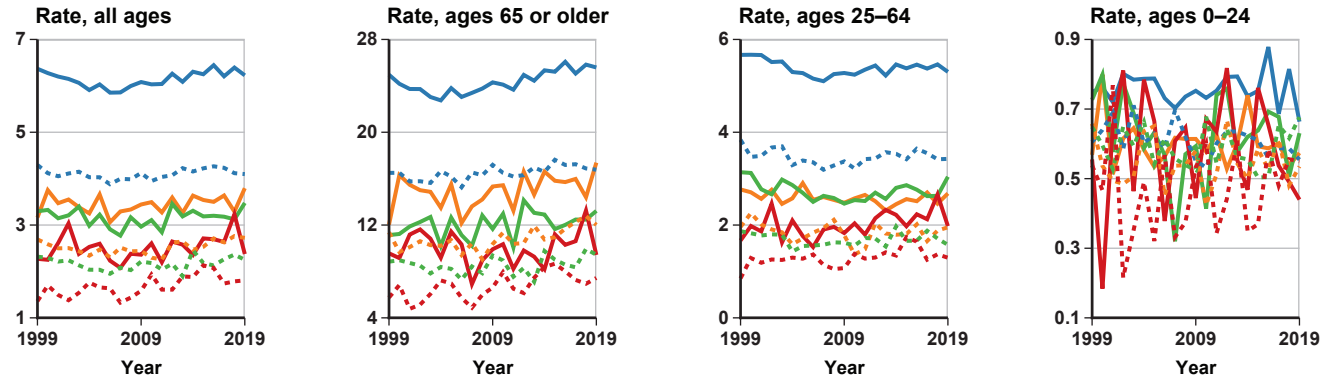
Chart 15.
Neoplasms: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

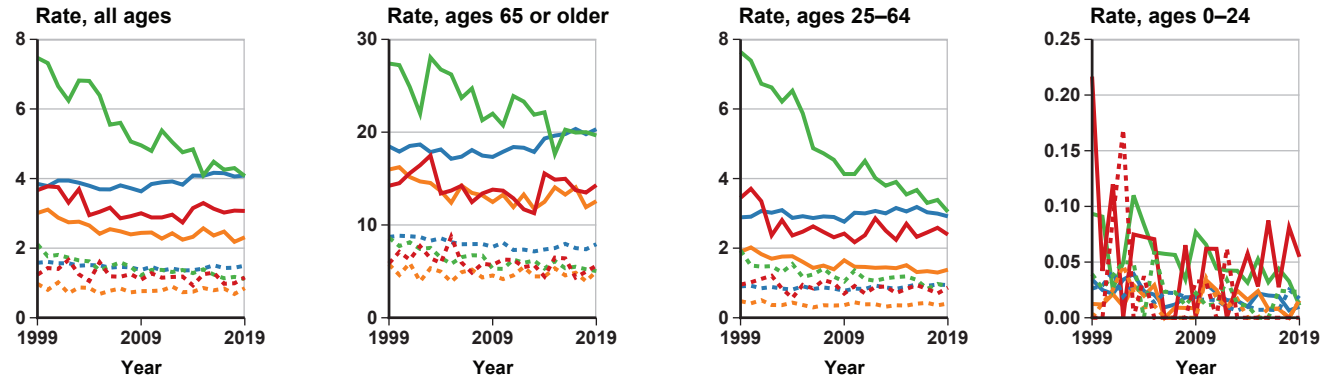
Panel J: Other digestive system organ cancers



Panel K: Eye, brain, and other nervous system cancers



Panel L: Oral cancer

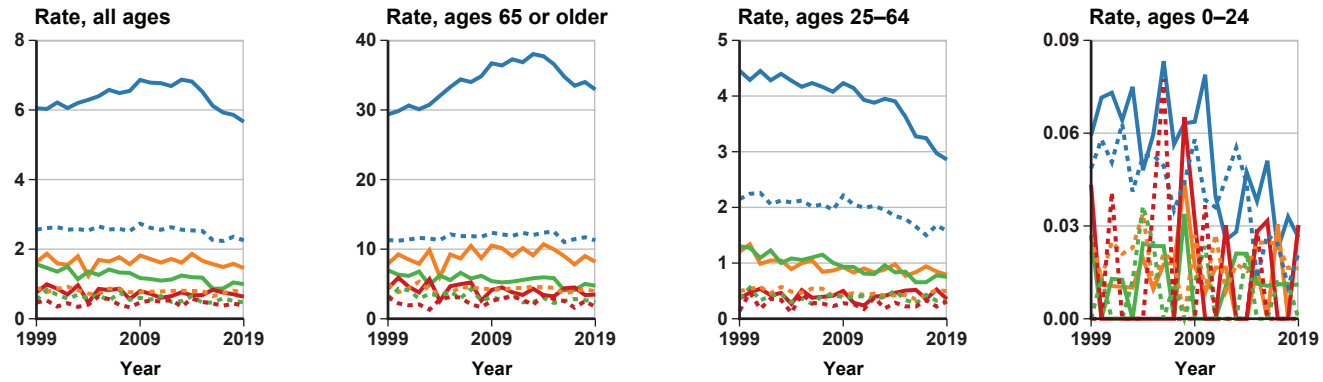


(Continued)

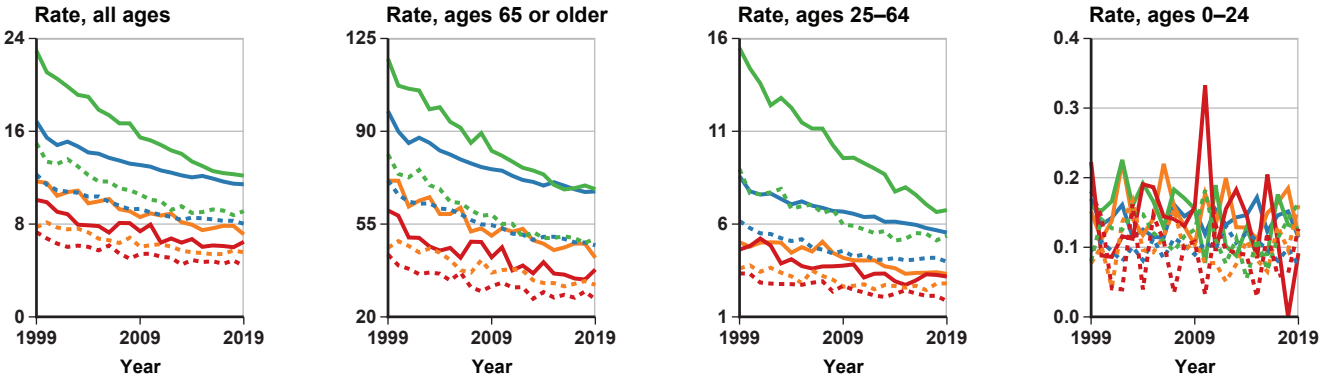
Chart 15.
Neoplasms: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

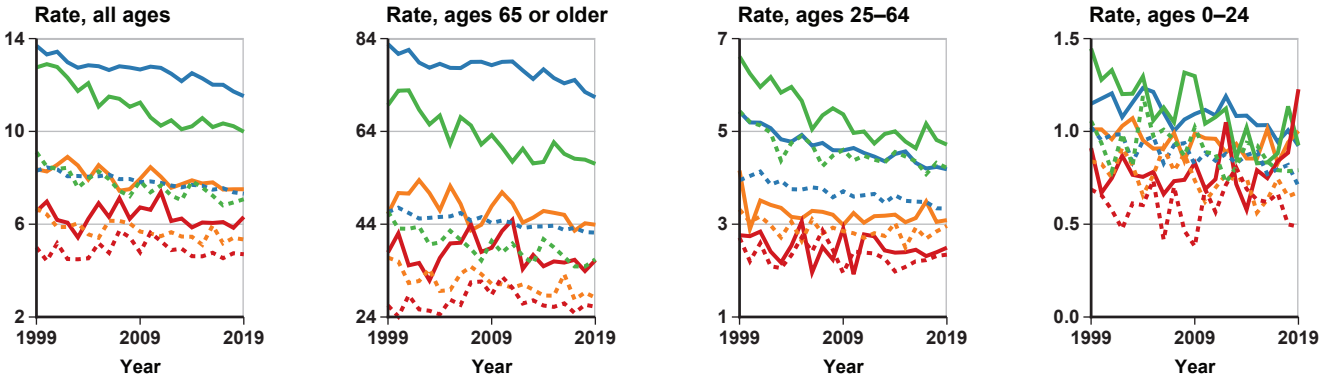
Panel M: Skin cancer



Panel N: Ill-defined and unspecified-site cancers



Panel O: Other neoplasms



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Chart 15, Panel B shows that Black males had the highest all-ages lung cancer mortality rate (50.2) in 2019, followed by WNH males (44.5) and WNH females (32.2). The all-ages lung cancer death rate for Black females was lower than that of WNH females, unlike the all-cancer mortality rates. All-ages lung cancer mortality rates are considerably lower for API individuals, and lower still for the Hispanic population. Over the period 1999–2019, the all-ages mortality gap between Black and WNH males declined, as the death rate dropped by more than half for Black males. Lung cancer mortality rates declined in both the 25–64 and 65 or older age groups among all RE groups and especially for men, narrowing the gender gap. For instance, in 1999, the all-ages male-to-female mortality ratio for the WNH and Black communities were 1.9 and 2.6, respectively. By 2019, the respective ratios were 1.4 and 1.9. Preston and Wang (2006) found that differences in mortality by sex are closely linked to cohort smoking patterns. The decline in smoking rates has affected not only lung cancer death rates, but also those for other smoking-related cancers, as well as circulatory system disorders such as coronary heart disease, chronic obstructive lung disease, and stroke.

In 2019, the percentage of cancer deaths at all ages that was caused by neoplasms of lymphoid, hematopoietic, and related tissue (leukemia and lymphoma for brevity) ranged from 8.3 percent among Black people to 10.4 percent among Hispanic people. At all ages, it was the second leading cause of cancer deaths among WNH males, the third leading cause among Hispanic males, and the fourth leading cause among Black and API males. Leukemia and lymphoma accounted for a greater share of cancer deaths among people aged 0–24 than for those in the other age groups, with people aged 25–64 having the lowest shares. For those aged 0–24, leukemia and lymphoma accounted for one-third of neoplastic deaths in the Hispanic population and about one-quarter of cancer deaths among the other RE groups.

Chart 15, Panel C shows that leukemia/lymphoma and related cancer mortality rates were lower in 2019 than in 1999 for all RE/sex and age groups. WNH males had the highest all-ages leukemia/lymphoma death rate, followed by Black and Hispanic males, while API and Hispanic females had the lowest mortality rates. At ages 25–64, however, Black men had higher leukemia/lymphoma mortality rates than WNH men, followed by Black women and Hispanic men, who had similar rates. At ages 0–24, Hispanic males had substantially higher leukemia/lymphoma mortality rates than any other RE/sex group. The higher prevalence of childhood leukemia among Hispanics is thought to be related to differences in exposure to environmental risk factors and to a higher risk associated with Native American ancestry (Hsu and others 2016).

In 2019, neoplasms of the breast represented the leading cause of all-ages cancer deaths for Hispanic females and the second leading cause of cancer death for females in all other RE groups. The percentages of all-ages cancer deaths that were caused by breast cancer ranged from 13.8 percent for WNH females to 18.3 percent among Black females. At ages 25–64, breast cancer accounted for almost one-quarter of cancer deaths among Black women. It was the leading cause of neoplastic-related deaths for Black, Hispanic, and API women at those ages.

Chart 15, Panel D shows that breast cancer mortality rates improved from 1999 to 2019 in all female populations, particularly at ages 25–64 and among the WNH and Black communities. In 2019, Black females had the highest all-ages mortality rate (26.8), followed by WNH and Hispanic females (19.4 and 13.9, respectively). API females had the lowest all-ages death rate (11.4), but a slower rate of improvement over time than those of the other RE groups.

In 2019, the shares of all-ages cancer deaths that were caused by neoplasms of the male genital organs ranged from 6.7 percent among the API population to 14.5 percent among the Black community. Prostate cancer was involved in more than 97 percent of deaths within this category. For females, malignant neoplasms of the genital organs accounted for 10–13 percent of cancer deaths across RE groups, with cervical, uterine, and ovarian cancers representing about 70 percent of these deaths. The percentage of cancer deaths among females caused by genital organs neoplasms peaks at ages 25–64; yet for males, it is highest at old ages, representing, for instance, 31.8 percent of cancer deaths in Black men aged 85 or older.

Chart 15, Panel E shows that the all-ages genital-organs cancer death rate in 1999 for Black males was 69.5, which was more than double the rate among WNH males (29.5), about triple the mortality rate of Hispanic males (23.6), and almost five times the rate for API males (14.1). By 2019, the mortality rate had improved more rapidly for Black males than for any other RE group, dropping by almost half to 35.7, but

it remained substantially higher than that of WNH males (17.9). Among females, the RE groups with the highest all-ages genital-organ cancer mortality rate in 2019 were Black (18.9) and WNH (14.3). The disparity in mortality rates between Black and WNH females increased slightly over the 1999–2019 period but was significantly smaller than that for males in any year. As mentioned earlier, prostate cancer generally develops more slowly and has a later age of onset than many cancers involving the female genital organs. Thus, women had higher genital organ cancer mortality rates at ages 25–64 than men. For instance, in 2019, the genital organ cancer death rates for API women and Black men aged 25–64 were 8.6 and 7.6, respectively. The genital organ cancer mortality rate for Black women aged 25–64 nearly doubled that of Black men, and the mortality rate among API women was seven times higher than that of API men. At ages 65 or older, the situation reversed, with men experiencing far higher genital-organ cancer mortality rates than women.

As a share of all cancer deaths in 2019, neoplasms of the urinary tract ranged from 3.5 percent in the API population to 5.5 percent among the WNH population. About 96 percent of these deaths involved cancers of the kidney and bladder. This subcategory's share of cancer deaths peaks at older ages and is more prevalent among males than females and for WNH and Hispanic individuals than for Black and API people. For instance, in 2019, 10.3 percent of cancer deaths at ages 85 or older in WNH males involved neoplasms of the urinary tract, compared with 5.4 percent among WNH females.

Chart 15, Panel F shows that WNH males had the highest all-ages urinary-tract cancer mortality rate in 2019 (13.3), followed by Black males (9.9) and Hispanic males (8.6). API males had a higher mortality rate (5.1) than females in any RE group. Among females, those who are WNH had slightly higher all-ages mortality rates than those who are Black (4.5 versus 4.1), while API females had the lowest death rate (2.0). Black males and females experienced the fastest urinary-tract cancer mortality rate improvement over the 1999–2019 period. At ages 25–64, WNH and Black men had similar mortality rates. However, at ages 65 or older, the death rate for WNH men (86.5) was significantly higher than that of Black men (60.2).

Neoplasms of the pancreas in 2019 caused less than 8 percent of all-ages cancer deaths. That share was greater than it had been in 1999 for all RE groups and was higher for females than males and at ages 65 or older than at ages 0–64.

Chart 15, Panel G shows that from 1999 to 2019, all-ages pancreatic cancer mortality rates improved slightly among Black males and Black and API females and remained flat for API males. The death rate was higher in 2019 than in 1999 for WNH and Hispanic males and females. Throughout the period, Black males had the highest mortality rates, followed by Black females until 2008, when their rate was surpassed by that of WNH males. Hispanic males and WNH females had similar pancreatic cancer mortality rates in 2019 (9.8 and 9.7, respectively), and the experience of API males and Hispanic females was likewise fairly similar (8.3 and 7.9, respectively).

From 1999 to 2019, the share of cancer deaths caused by neoplasms of the liver and intrahepatic bile ducts rose substantially in all population groups. By 2019, those shares ranged from 3.9 percent of cancer deaths for WNH people to 8.9 percent of cancer deaths for API people. The percentages are significantly higher for males than females and among the API and Hispanic populations than in the other RE groups. For instance, liver cancer accounted for 11.6 percent of all cancer deaths among API males in 2019, becoming the third most prevalent cause of cancer deaths for that group, after lung cancer and neoplasms of "other organs of the digestive system."

Chart 15, Panel H shows that in 1999, API males had the highest all-ages liver cancer mortality rate of any RE/sex group (14.8), while API females had a higher death rate (6.5) than all other female RE groups. By contrast, WNH individuals had the lowest all-ages liver cancer mortality rates of any RE group regardless of sex. From 1999 to 2019, all-ages liver cancer mortality rates increased significantly among WNH, Black, and Hispanic people of either sex, while they declined among API individuals. Chang and others (2007) elaborated:

> The increasing liver cancer incidence rates in Hispanics, Whites, and Blacks have generally been attributed to the spread of hepatitis C virus (HCV) infection in the U.S., as reflected by the two- to four-fold increase in the incidence of acute HCV infection between the early 1960s and the late 1980s. In contrast, the disproportionately high rate of liver cancer incidence in APIs is ascribed

primarily to the high prevalence of chronic hepatitis B virus (HBV) infection, which is etiologically associated with the majority of liver cancer in Asian natives and migrants. Chronic HBV infection is carried by approximately 10% of the population in eastern and southeastern Asia and sub-Saharan Africa, as well as immigrants from those regions, whereas the prevalence is estimated at below 0.5% in the overall U.S. population.

In 2019, the shares of cancer deaths attributed to neoplasms of the colon ranged from 6.3 percent for WNH individuals to 7.8 percent among Hispanic people. Those shares had declined since 1999 and were higher in the midlife years than for the other age groups, representing, for example, 10.3 percent of cancer deaths among Hispanic men aged 25–64.

Chart 15, Panel I shows that from 1999 to 2019, all-ages colon cancer mortality rates declined in all RE/sex groups, especially among WNH and Black males and females. Over the observation period, Black males had the highest all-ages colon cancer mortality rates, followed by Black females until 2018, when their death rate was surpassed by that of WNH males. At ages 65 or older, WNH men had a higher colon cancer mortality rate in 2019 (61.4) than did Black women (58.1). At ages 25–64, Black women had higher colon cancer mortality rates than WNH men from 1999 to 2018; but in 2019, the groups' death rates converged at 7.0.

As noted earlier, the subcategory "neoplasms of other organs of the digestive system" includes cancers of the esophagus, stomach, small intestine, and rectum, but excludes liver, pancreatic, and colon cancers, which constitute separate subcategories. In 2019, the shares of neoplasm deaths that were caused by other digestive system organ cancers ranged from 7.3 percent for WNH individuals to 10.5 percent in the API community. The share of deaths is higher among males than females, in the midlife years than at older ages, and among the API and Hispanic communities than in the other RE groups. Other digestive system organ cancers were the second leading cause of all-ages cancer deaths for API and Hispanic males and the third leading cause among WNH and Black males.

Chart 15, Panel J shows that from 1999 to 2019, all-ages mortality rates from other digestive system organ cancer declined among all RE/sex groups and, for both sexes, the improvement in mortality rates was greatest for the API and Black populations and lowest among WNH individuals. Black males had the highest all-ages other digestive system organ cancer mortality rate in 2019 (18.3), followed by WNH males (16.5) and Hispanic males (14.1). Among females, those who are Black had the highest all-ages mortality rate in 2019 (9.6), while those who are WNH had the lowest rate (7.2). Unlike their outcomes for colon cancer, Black females had lower mortality rates from other digestive system organ cancers than Hispanic and API males.

In 2019, the shares of cancer deaths that were caused by neoplasms of the eye, brain, and other parts of the central nervous system ranged from 1.7 percent for Black individuals to more than 3 percent among the WNH and Hispanic populations. About 96 percent of deaths in this subcategory involved neoplasms of the brain. This subcategory represents one of the most common causes of cancer death at ages 0–24 and, in any age group, the percentages tend to be higher among males than females.

Chart 15, Panel K shows that WNH males and females had the highest all-ages mortality rates for eye, brain, and other nervous system cancers in 2019 (6.2 and 4.1, respectively). Hispanic males followed, with a slightly higher mortality rate than Black males (3.8 and 3.5, respectively). Of the eight RE/sex groups, Black and API females had the lowest all-ages mortality rates. At ages 65 or older, the death rate from eye, brain, and other nervous system cancers for WNH men was about twice that of Black men (25.6 versus 13.2) in 2019. Over the observation period, mortality rates associated with eye, brain, and other nervous system cancers remained flat for most RE/sex groups. The all-ages death rate was higher in 2019 than in 1999 among Black, API, and Hispanic males and for API and Hispanic females.

In 2019, neoplasms of the lip, oral cavity, and pharynx represented 1–2 percent of all cancer deaths among the RE groups. Risk factors for oral cancer include tobacco use, excessive alcohol consumption, and human papillomavirus (HPV) infection. Oral cancer accounts for higher shares of cancer deaths among males than females and in the midlife years than at other ages. For instance, in 2019, 4.6 percent of cancer deaths among API men aged 25–64 were attributed to oral cancer.

Chart 15, Panel L shows that in 1999, the all-ages oral cancer death rate for Black males (7.5) was nearly twice that of WNH males (3.8). However, by 2019, the rate for both groups was 4.1. Among males, the

Hispanic RE group had the lowest all-ages oral cancer mortality rate. Among females, the WNH group had the highest all-ages oral cancer mortality rate and the Hispanic group had the lowest rate. From 2010 to 2019, the incidence rates of HPV-associated oral cancers increased, and differences in sexual behavior may partially account for observed variations in those increases by RE group (Ellington and others 2020).

In 2019, melanoma and other neoplasms of the skin accounted for 0.4 percent of cancer deaths among Black people, 1.0 percent of those in the Hispanic community, and 2.4 percent of cancer deaths in the WNH population. The skin-cancer share of neoplasm deaths was higher for people aged 25–64 than those in other age groups and for males than females.

Chart 15, Panel M shows that in 2019, the all-ages skin cancer mortality rate for WNH males was 5.7 times that of Black males and the rate for WNH females was 4.6 times that of Black females. Although the incidence rate of melanoma in the Black population is very low, survival outcomes are poorer than those of the WNH population (Culp and Lunsford 2019).[21]

Neoplasms of "ill-defined, other secondary, and unspecified sites" caused 5–6 percent of cancer deaths across the RE groups for all ages combined. This subcategory's share of cancer deaths is typically higher at older ages than in the midlife years and in the WNH and Black communities than for the other RE groups.

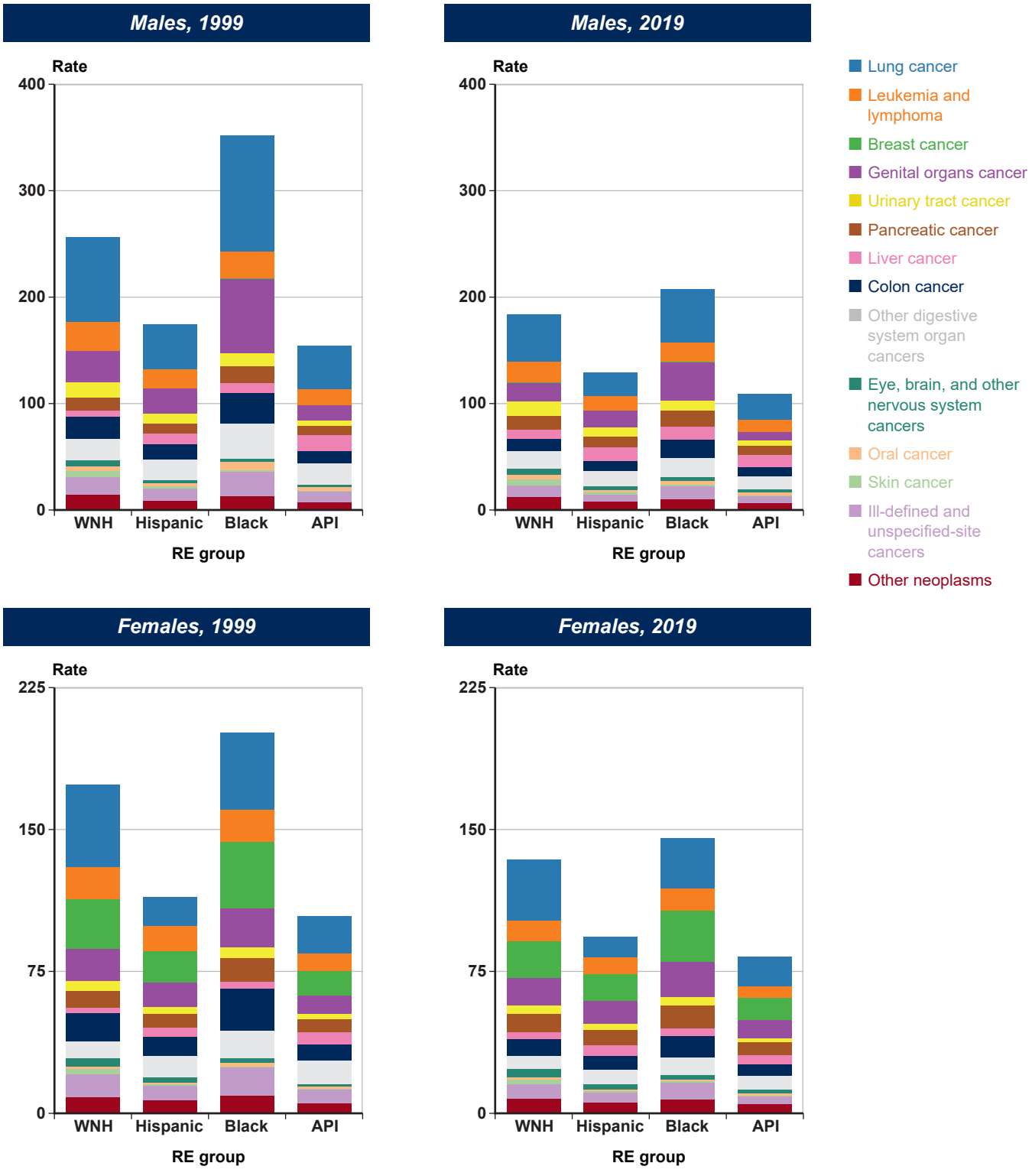
Chart 15, Panel N shows that from 1999 to 2019, all-ages ill-defined and unspecified-site cancer mortality rates declined in every RE/sex group, particularly among Black males. In 1999, the mortality rate for Black males (22.9) was 1.4 times higher than that of the RE/sex group with the second highest rate, WNH males. By 2019, the mortality ratio between the two populations (which still had the two highest rates among the RE/sex groups) had dropped to 1.1. Both Black and WNH females had higher all-ages ill-defined and unspecified-site cancer mortality rates than Hispanic and API males. Over the observation period, the male-to-female mortality gap declined for the Hispanic and Black populations but increased among WNH and API individuals.

The final subcategory, all other neoplasms, includes neoplasms of the thyroid gland, endocrine glands, bone and articular cartilage, and mesothelial and soft tissue; neoplasms of uncertain or unknown behavior; and in situ and benign neoplasms. Across the RE groups, this subcategory accounts for 4.5–6.0 percent of cancer deaths at all ages combined, and is one of the leading causes of cancer deaths at ages 0–24.

Chart 15, Panel O shows that from 1999 to 2019, other-cancer mortality rates declined in 31 of the 32 population groups (API males aged 0–24 were the lone exception). WNH males had the highest all-ages mortality rates each year, followed by Black males. In 2019, Black females had a lower all-ages other-cancer mortality rate than both WNH females and Hispanic males.

In summary, with a few exceptions (mainly liver cancer), the death rates associated with most neoplasm subcategories declined throughout the 1999–2019 period, resulting in substantial mortality rate improvement for all RE/sex groups. This is evident in Chart 16, which shows the all-ages neoplasm mortality rates by cause-of-death subcategory, RE group, and sex in 1999 and 2019. In 1999, of the eight RE/sex groups, Black males had significantly higher mortality rates for most cancers (the exceptions were liver and urinary tract cancers; cancer of the eye, brain, or nervous system; leukemia and lymphoma; skin cancer; and the "all other neoplasms" subcategory). The disparity was so substantial that the combined mortality rate from only two cancer subcategories (neoplasms of the respiratory system and the genital organs) was higher for Black males (178.0) than the total cancer mortality rates for Hispanic and API males. Similarly, for Black females, the mortality rate from a combination of four types of cancer (lung, breast, genital organs, and colon) outstripped the all-cancer mortality rates of Hispanic and API females. Over the 20 years that followed, the cancer mortality rates of Black males and females improved more rapidly than those of all other RE/sex groups, narrowing the gaps.

Chart 16.
Neoplasms: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Diseases of the Respiratory System

Deaths associated with respiratory system diseases in 2019 accounted for 10.3 percent of all deaths among WNH individuals, 7.3 percent of those among the API population, and 6.6 percent of deaths in the Black and Hispanic communities. This section discusses the five subcategories of respiratory system diseases listed in Box 4.

Chart 17 shows the number and percentage distribution of respiratory system disease–related deaths by subcategory for 1999 and 2019, with detail by RE group and age. The leading cause of death among respiratory disorders is chronic lower respiratory diseases, a category that is dominated by chronic obstructive pulmonary disease (COPD). Although this subcategory also includes emphysema and asthma, it is labeled COPD hereafter for brevity. COPD accounts for disproportionately high shares of deaths among the WNH and Black populations. In 2019, it constituted 35.8 percent of respiratory system disease–related deaths in the API community and 40.3 percent of those among Hispanic individuals, compared with 49.5 percent of such deaths in the Black population and 60.5 percent of those among WNH people. The share of respiratory system–related deaths caused by diseases in this subcategory peaked at ages 65 or older, where it was the leading cause of death for all RE groups. In the midlife years, however, influenza and pneumonia accounted for a higher share of deaths among the Hispanic and API populations. At ages 0–24, COPD was the leading cause of respiratory system disease–related death for only the Black population.

Chart 18 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for respiratory system diseases overall.

Chart 18, Panel B shows that in 2019, WNH males had the highest all-ages COPD mortality rate, followed by WNH females, Black males, and Black females. The all-ages death rate for WNH females surpassed that of Black males in 2007, and the rate for Black females first exceeded the rate for Hispanic males in 2014. All-ages COPD mortality rates improved during the 1999–2019 period for every RE/sex group except WNH females. API men had the highest all-ages mortality rate improvement, with the rate declining by half, from 29.6 to 14.7. At ages 65 or older, the COPD mortality rate for Black women was lower than that of API men until 2014 and was lower than that of Hispanic men every year except 2018. At ages 25–64, however, Black women had higher COPD mortality rates than Hispanic and API men throughout the period.

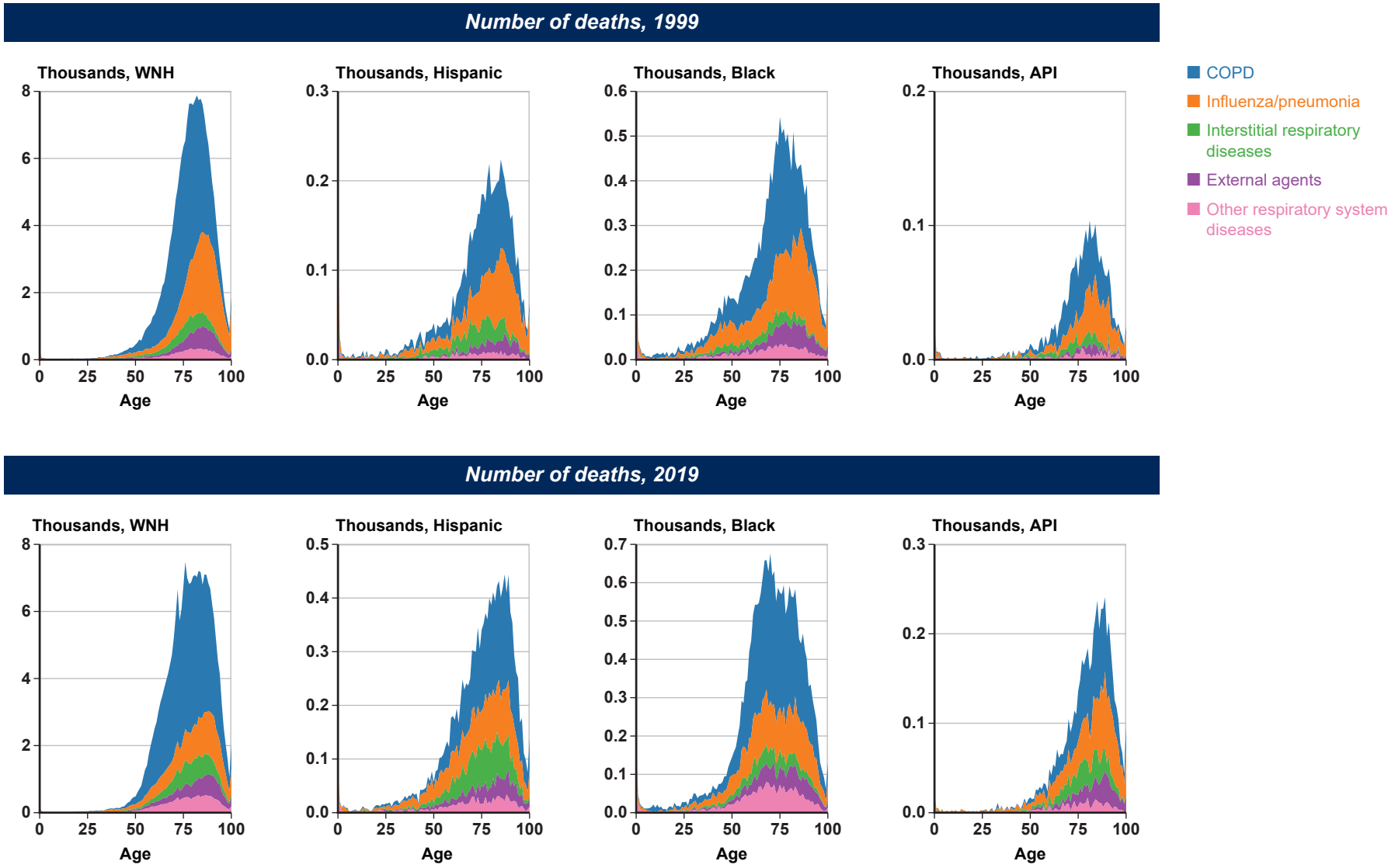
Box 4.
Respiratory system disease cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Chronic lower respiratory diseases	COPD (chronic obstructive pulmonary disease)	J40–J47
Influenza and pneumonia	Influenza/pneumonia	J09–J18
Other respiratory diseases principally affecting the interstitium	Interstitial respiratory diseases	J80–J84
Lung diseases due to external agents	External-agent lung disease	. . .
Pneumoconiosis from inhalation of coal dust, asbestos, other mineral fibers, dust containing silica, or other inorganic dusts	. . .	J60–J65
Respiratory conditions cause by inhalation of chemicals, gases, fumes, or vapors	. . .	J68–J70
All other respiratory system diseases	Other respiratory system diseases	. . .
Acute upper respiratory infections	. . .	J00–J06
Other acute lower respiratory infections	. . .	J20–J22
Other diseases of the upper respiratory tract	. . .	J30–J39
Suppurative and necrotic conditions of the lower respiratory tract	. . .	J85–J86
Other diseases of the pleura	. . .	J90–J94
Other diseases of the respiratory system	. . .	J96–J99

SOURCE: ICD-10.

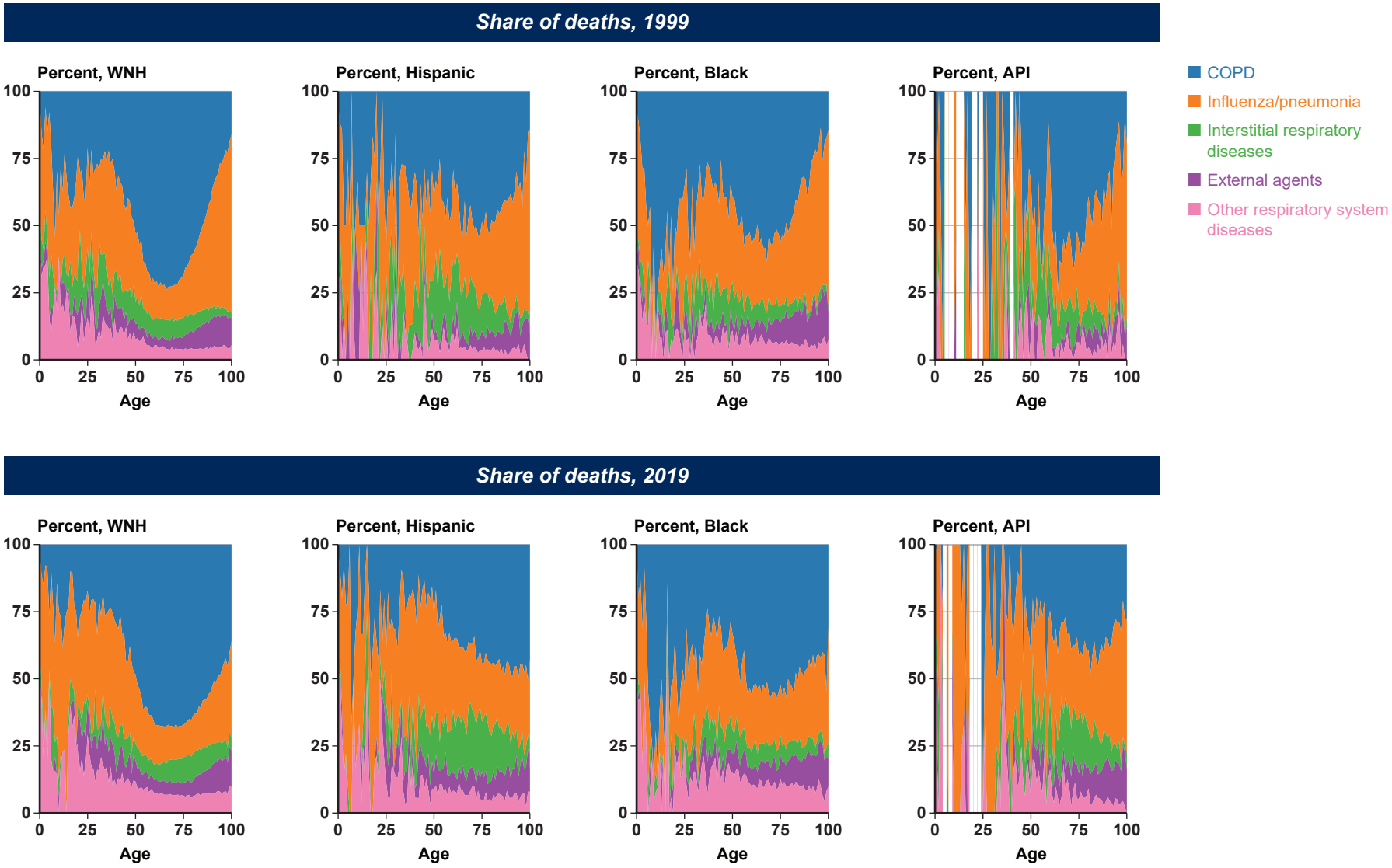
NOTE: . . . = not applicable.

Chart 17.
Respiratory system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019



(Continued)

Chart 17.
Respiratory system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*

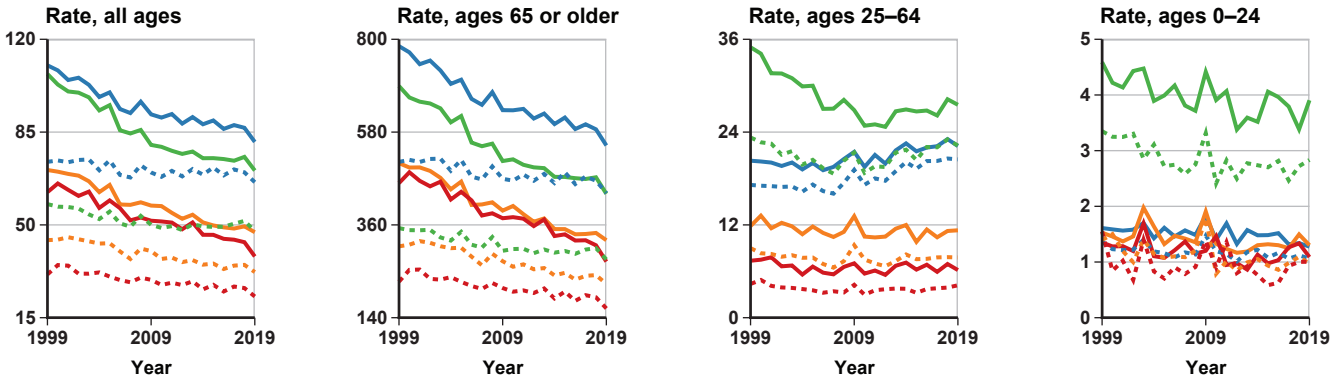


SOURCE: Author's calculations based on CDC WONDER.

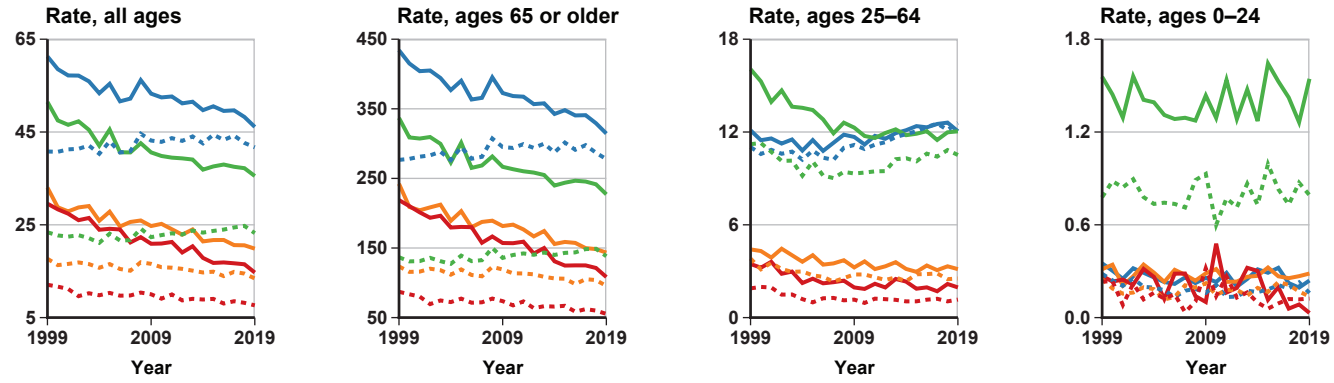
Chart 18.
Respiratory system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel A: All respiratory system diseases



Panel B: COPD



Panel C: Influenza/pneumonia

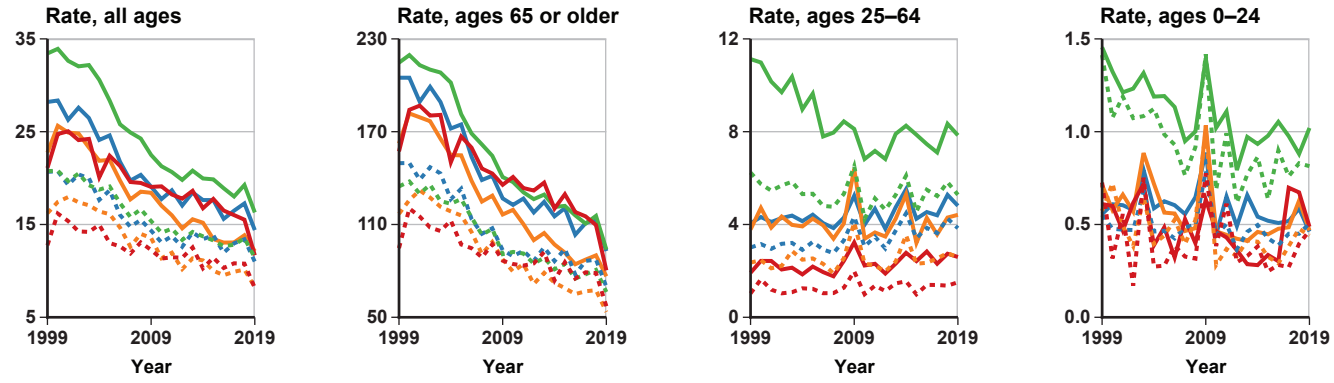


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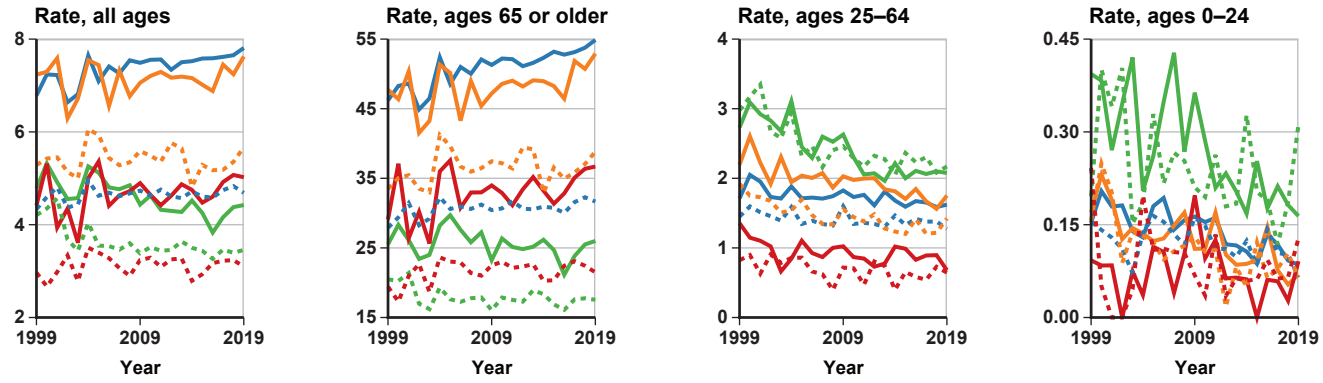
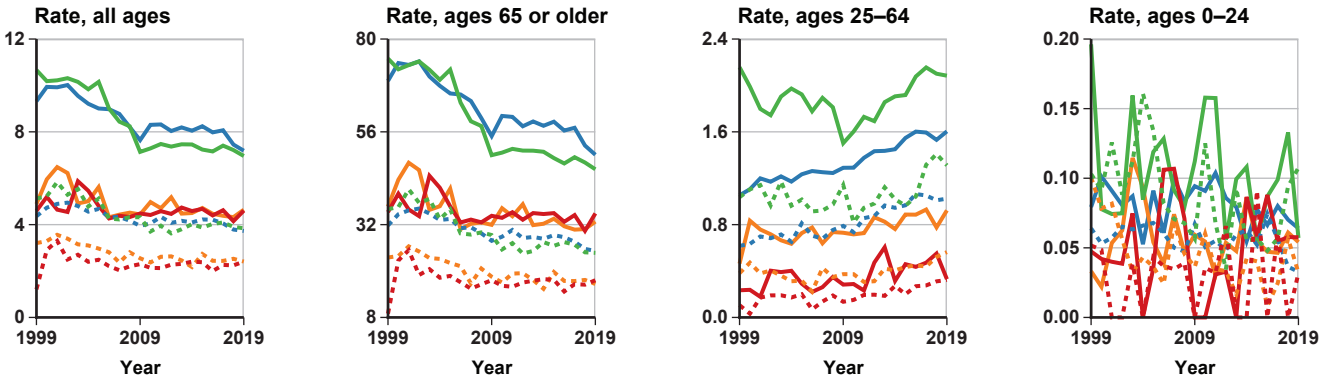
Chart 18.
Respiratory system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

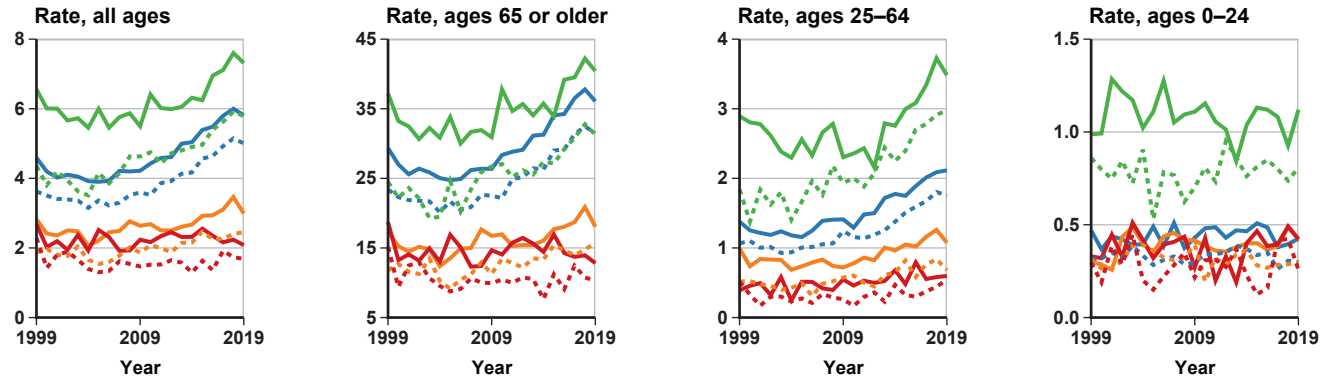
Panel D: Interstitial respiratory diseases



Panel E: External agents



Panel F: Other respiratory system diseases



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Taken together, influenza and pneumonia cause the second most respiratory system disorder–related deaths. In 2019, the shares of respiratory system–related deaths caused by influenza/pneumonia at all ages ranged from 16.9 percent among WNH individuals to 33.2 percent in the API population. Those shares tended to peak among the very young and very old, although they declined substantially over the observation period for the aged. For instance, in 1999, influenza/pneumonia was the leading cause of respiratory disease death for individuals older than 84 in every RE group. By 2019, COPD accounted for a greater share of respiratory disease deaths in that age group. Among people aged 0–24, influenza/pneumonia was the main cause of respiratory system–related death for the API, Hispanic, and WNH populations.

From year to year, influenza/pneumonia mortality varies with several factors, including the strain of the seasonal flu virus, vaccination rates, and the effectiveness of the vaccines. Nevertheless, the influenza/pneumonia mortality rate declined significantly over the 1999–2019 period, driven by mortality rate improvement among the aged (Chart 18, Panel C). The death rate for individuals aged 65 or older declined by more than half among WNH, Black, and Hispanic men and women. For instance, among aged Black men, the mortality rate dropped from 214.6 to 93.8 over the period. In 2019, Black males had the highest all-ages influenza/pneumonia mortality rate, followed in rank order by WNH males, Hispanic males, and API males. Among females, the RE group with the highest all-ages death rate was Black (11.4), followed closely by WNH (11.0). Hispanic and API females had the lowest all-ages influenza/pneumonia mortality rates (8.3 and 8.2, respectively). One notable feature of the graphs in Panel C is the spike in mortality in 2009 for the two age groups younger than 65. Influenza/pneumonia mortality at ages 25–64 was higher in 2009 than in any other year in the 1999–2019 period for Black, Hispanic, and API women and for Hispanic and API men. Similarly, the death rate at ages 0–24 peaked in 2009 among WNH and Hispanic males and in all RE groups for females. On June 11, 2009, the World Health Organization declared a global pandemic of the H1N1 virus, or the "swine flu" (CDC 2010). Although many young people have some immunity to seasonal influenza, very few had any immunity to the H1N1 virus and were especially vulnerable to it.

The third most common cause of respiratory system–related death is interstitial respiratory disease—a subcategory formally titled "other respiratory diseases principally affecting the interstitium." This term generally refers to the fluid-filled space existing between structural barriers, such as between a cell wall and an organ. For example, the pulmonary interstitium is the tissue that surrounds the lung's air sacs, blood vessels, and airways, and interstitial respiratory disease involves scarring and inflammation of the interstitium (as in pulmonary fibrosis). The share of respiratory system–related deaths attributed to this subcategory of disorders is disproportionately high for Hispanic people. For example, in 2019, interstitial respiratory disease caused 16.8 percent of all respiratory system–related deaths at all ages among the Hispanic population, in contrast with 6.8 percent of those in the Black community.[22]

Chart 18, Panel D shows that in 2019, WNH males had the highest all-ages interstitial respiratory disease mortality rate (7.8), followed by Hispanic males (7.6) and Hispanic females (5.7). API females, Black females, and Black males had the lowest mortality rates. At ages 25–64, Black men and women had the highest interstitial respiratory disease death rates; yet at ages 65 or older, death rates were lower for Black people than for individuals of the same sex in the other RE groups. For instance, the interstitial respiratory disease mortality rate at ages 65 or older was 17.6 for Black women and 21.5 for API women in 2019. Similarly, the death rate at ages 65 or older from this cause was 26.0 for Black men, 36.7 for API men, and 52.9 for Hispanic men. All-ages interstitial respiratory disease mortality was higher in 2019 than in 1999 for all RE/sex groups other than Black males and females.

Lung diseases caused by external agents include pneumoconiosis from the inhalation of coal dust, asbestos and other mineral fibers, dust containing silica, or other inorganic dusts; and respiratory conditions caused by inhalation of chemicals, gases, fumes, and vapors. In 2019, diseases in this subcategory constituted about 7 percent of respiratory system–related deaths among WNH people, 8.5 percent of those deaths among the Hispanic and Black populations, and 11.0 percent of those among API individuals. The subcategory's share of respiratory system–related deaths typically increases at older ages, in 2019 being more than 10 percent in every RE group at ages 85 or older.

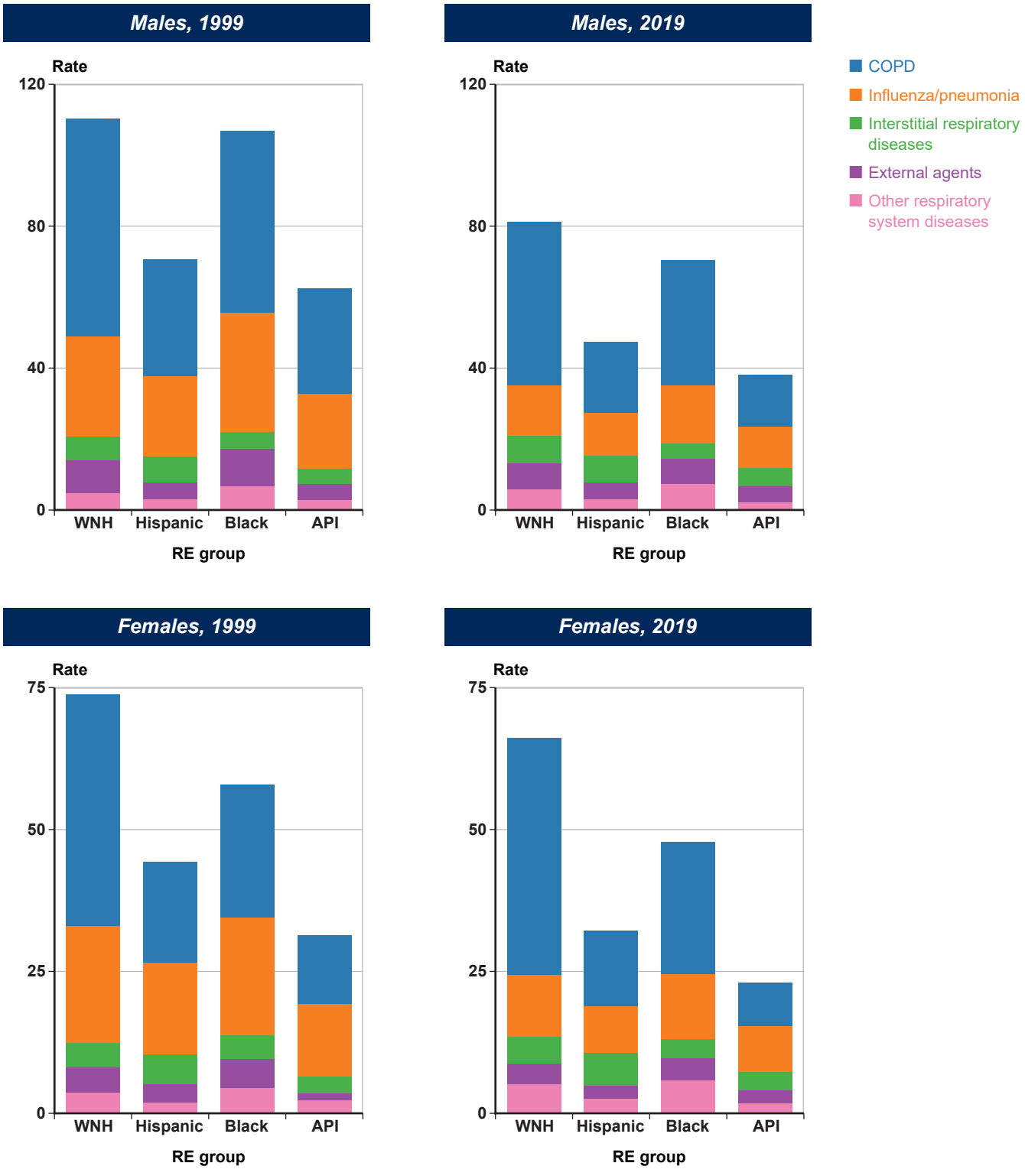
Chart 18, Panel E shows that, for either sex, external-agent lung disease mortality was substantially higher for the WNH and Black populations than the other two RE groups. In 2019, WNH and Black males had all-ages mortality rates of 7.2 and 7.0, respectively, while the rates for API and Hispanic males both were 4.6. In every RE group, the all-ages mortality rates in this subcategory were lower for females than for males. Over the 1999–2019 period, all-ages mortality rates from external-agent lung diseases declined for all RE/sex groups except API males and females. Among people aged 25–64, however, mortality rates increased during the second half of the period in all RE/sex groups.

The residual subcategory "all other respiratory system diseases" includes acute upper respiratory infections, other acute lower respiratory infections (such as bronchitis and bronchiolitis), other diseases of the upper respiratory tract (for example, chronic sinusitis, laryngitis, and laryngotracheitis; and disorders of the nose and nasal sinuses, tonsils, adenoids, vocal cords, and larynx), suppurative and necrotic conditions of the lower respiratory tract, other diseases of the pleura, and other diseases of the respiratory system (that is, respiratory failure not elsewhere classified). In 2019, disorders in this subcategory accounted for 6.5 percent of respiratory system–related deaths among API people, less than 8 percent of those deaths among WNH and Hispanic individuals, and 11.5 percent of respiratory system–related deaths in the Black community.

Chart 18, Panel F shows that in 2019, all-ages mortality from other respiratory diseases was highest among Black males (7.3), followed by WNH males and Black females (each with 5.8). API females had the lowest mortality rate from other respiratory diseases at 1.7.

Chart 19 shows all-ages respiratory system disease mortality rates by cause-of-death subcategory, RE group, and sex in 1999 and 2019. WNH males and females experienced higher mortality rates than their Black counterparts. Although Black males in 1999 had higher mortality rates associated with influenza/pneumonia, lung diseases caused by external agents, and the residual "all other respiratory system diseases" subcategory, these were more than offset by the higher COPD death rate among WNH males, accounting for the latter group's higher overall respiratory system disease death rate. From 1999 to 2019, the ratio of all-ages respiratory system disease mortality rates between WNH males and Black males rose from 1.0 to 1.2. The pattern was similar among females, but with greater mortality differentials by race. For instance, by 2019, the all-ages respiratory system disease mortality-rate ratio between WNH and Black females was 1.4. The combined all-ages mortality rate for COPD and influenza/pneumonia among WNH females (52.7) exceeded the overall respiratory disorders mortality rate among Black females (47.7). Moreover, the all-ages COPD mortality rate for WNH females in 2019 (41.7) was significantly higher than the all-ages mortality rate from all respiratory diseases among Hispanic females (32.2) and API females (23.0).

Chart 19.
Respiratory system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

External Causes of Mortality

In 2019, external causes were the overwhelming leading cause of death among people aged 0–24. For those aged 25–64, this category was the leading cause of death among Hispanic and WNH men, the second leading cause of death among Black men (after circulatory system diseases), and the third leading cause of death among API men and among women of all RE groups. This section provides a closer look at the seven external cause-of-death subcategories listed in Box 5.

Chart 20 shows the number and percentage distribution of external-cause deaths by subcategory for 1999 and 2019, with detail by RE group and age. The distribution of deaths by type of external cause varies widely across RE groups. Assaults constituted a disproportionately large share of external-cause deaths for the Black and Hispanic populations, while suicides represented a greater share of deaths among WNH and API individuals. In 1999, assault was the leading external cause of death for Black people (32.1 percent) and the second leading external cause of death in the Hispanic community (20.9 percent), while it accounted for only 13.4 percent and 5.2 percent of external-cause deaths among API and WNH people, respectively. Conversely, suicide in 1999 accounted for almost one-quarter of external-cause deaths among the WNH and API populations, but for only 12.5 percent and 8.2 percent of deaths, respectively, among Hispanic and Black people.

The composition of external-cause deaths by subcategory has also changed dramatically over time. In 1999, the most common type of external-cause death, transportation accidents, accounted for about one-third of such deaths for all RE/sex groups except Black men, for whom assault accounted for more external-cause deaths (35.2 percent, versus 23.5 percent for transportation accidents). By 2019, the shares of external-cause deaths attributed to transportation accidents had declined, ranging from 14.9 percent among WNH individuals to 23.5 percent among the Hispanic population. On the other hand, the proportion of external-cause deaths that were due to accidental poisoning rose sharply during this period, fueled by an epidemic of opioid overdoses. Relative to 1999,

Box 5.
External cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Transportation accidents	Transportation accidents	V01–V99
Assault	Assault	X85–Y09
Intentional self-harm	Suicide	X60–X84
Accidental poisoning by and exposure to noxious substances	Poisoning	X40–X49
Falls	Falls	W00–W19
All other accidental causes	Other accidents	. . .
Exposure to inanimate mechanical forces	. . .	W20–W49
Exposure to animate mechanical forces	. . .	W50–W64
Accidental drowning and submersion	. . .	W65–W74
Other accidental threats to breathing	. . .	W75–W84
Exposure to electric current, radiation, and extreme ambient air temperature	. . .	W85–W99
Exposure to smoke, fire, and flames	. . .	X00–X09
Contact with heat and hot substances	. . .	X10–X19
Contact with venomous animals and plants	. . .	X20–X29
Exposure to forces of nature	. . .	X30–X39
Overexertion, travel, and privation	. . .	X50–X57
Accidental exposure to other and unspecified factors	. . .	X58–X59
All other external causes of death	Other external causes	. . .
Event of undetermined intent	. . .	J00–J06
Legal intervention and operations of war	. . .	J20–J22
Complications of medical and surgical care	. . .	J30–J39
Sequelae of external causes	. . .	J85–J86

SOURCE: ICD-10.
NOTE: . . . = not applicable.

Chart 20.
External causes: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019

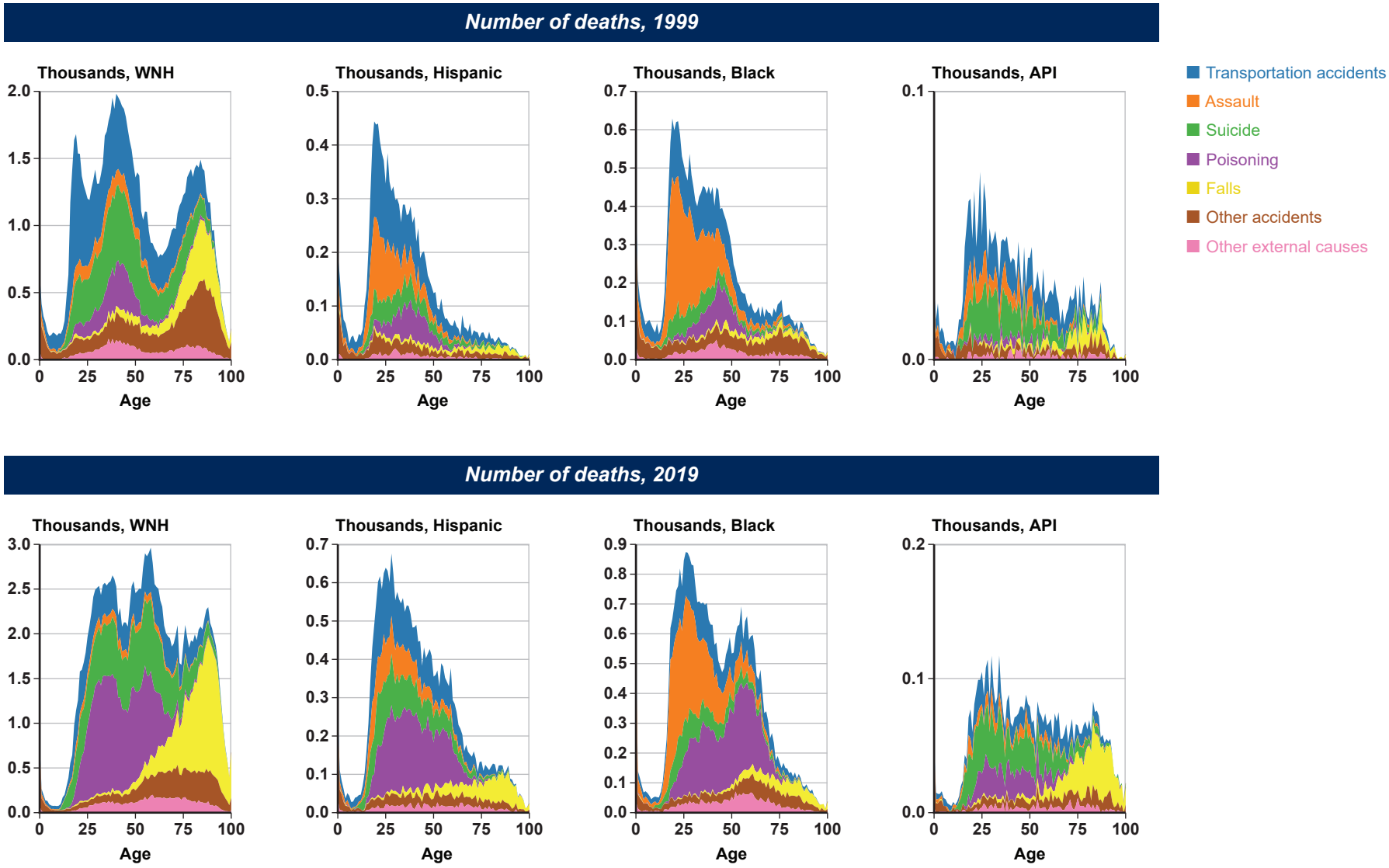


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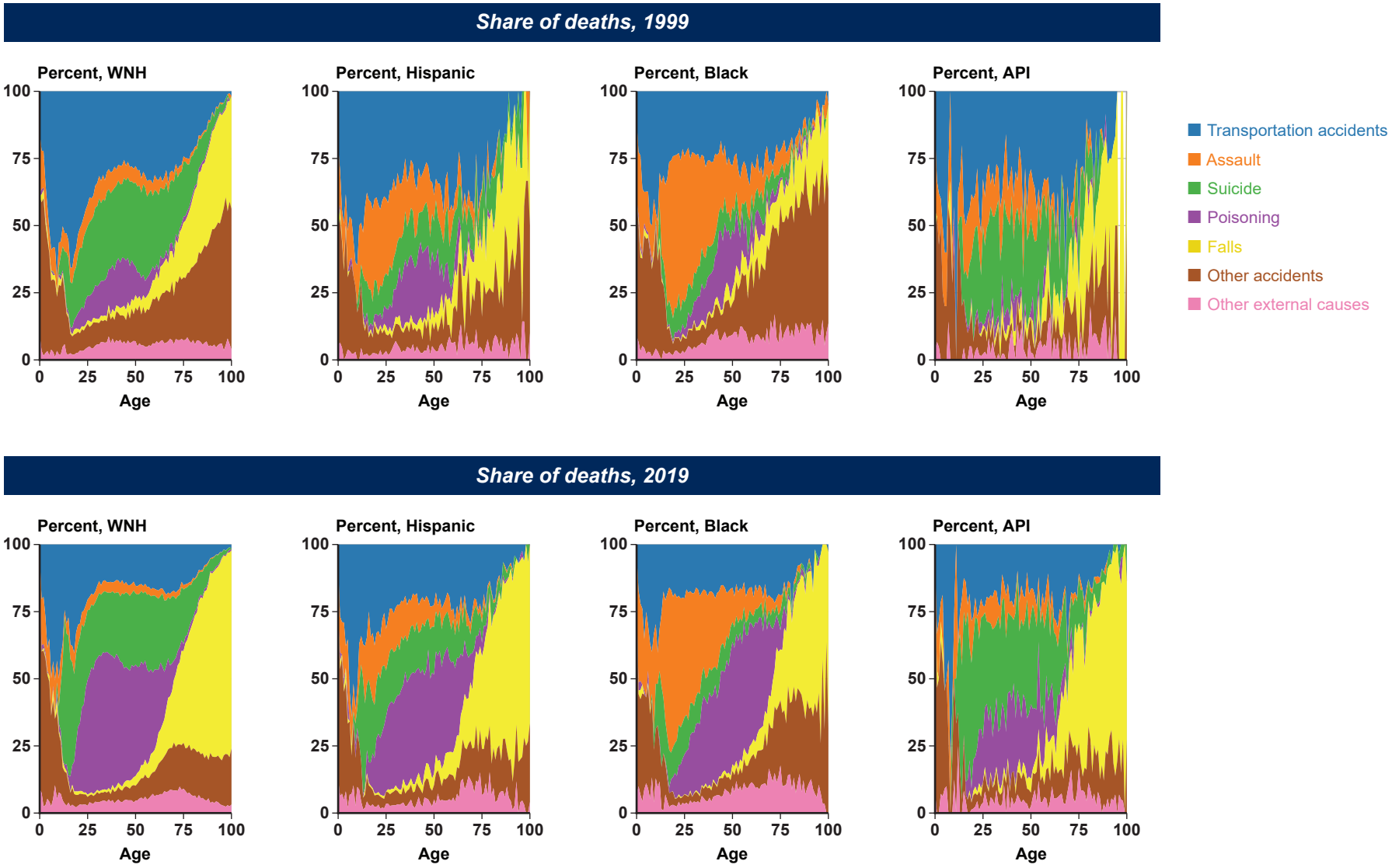
Chart 20.
External causes: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*



SOURCE: Author's calculations based on CDC WONDER.

the percentage of all external-cause deaths attributed to accidental poisonings in 2019 had increased by 2.5 times among Hispanic people (to 27.6 percent), had more than tripled for the Black and WNH populations (to 26.7 percent and 26.2 percent, respectively), and had more than quadrupled in the API community (from 3.5 percent to 14.1 percent). At all ages, accidental poisoning was the leading external cause of death in 2019 among all RE groups except API individuals, for whom suicide represented the largest subcategory (26.7 percent).

Another notable external cause of death in Chart 20 is falls, which are infrequent among the young and those in the midlife years (less than 2 percent for those aged 0–24 and less than 5 percent for those aged 25–64) but represent a significant external cause of death at older ages. The share of deaths caused by falls has increased substantially over time, becoming the leading external cause of death among those aged 65 or older in every RE group. In 2019, falls accounted for half of external-cause deaths among Black people aged 85 or older and more than 66 percent of deaths in that age group for the other RE groups. Note that although deaths caused by falls cluster at the oldest ages (when external causes of death represent a small fraction of all-cause mortality), the number of deaths is significant. The share of external-cause deaths attributable to falls at all ages was substantially higher among the WNH and API populations (about 19 percent in 2019), exceeding the share attributable to transportation accidents for these two RE groups.

As noted earlier, for each RE group, mortality rates from external causes are higher for males than females. The distribution of external-cause deaths by subcategory also varies significantly by sex. In 2019, over all ages combined, falls were the leading cause of death for both WNH and API females, while poisonings and suicides were the most commonly occurring subcategories among WNH and API males, respectively. More Black males died because of assault than from any other external cause, while poisoning was the leading external cause of death among Black females. Likewise for Hispanic males, poisoning was the leading external cause of death in 2019. However, among external-cause deaths, more Hispanic females died from transportation accidents (24.9 percent) than poisonings (23.2 percent) in 2019.

Chart 21 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for external causes of mortality overall.

Demographers have referred to an "accidental mortality hump," the spike in mortality among young adults that deviates from the normal pace of senescence (Remund, Camarda, and Riffe 2018). As an example, in 1999, transportation accidents were the leading external cause of death for every non-Black RE group aged 0–24 and 25–64. In that year, traffic accidents led to 52 percent of external-cause deaths among WNH people aged 0–24, and to 41 percent of those among young Hispanic and API individuals. Chart 21, Panel B shows that, from 1999 to 2010, transportation accident mortality rates declined for every RE/sex group, especially among females. However, during the 2011–2019 period, the transportation accident mortality rates declined much more slowly among the WNH and API communities, and they increased among the Black and Hispanic populations.

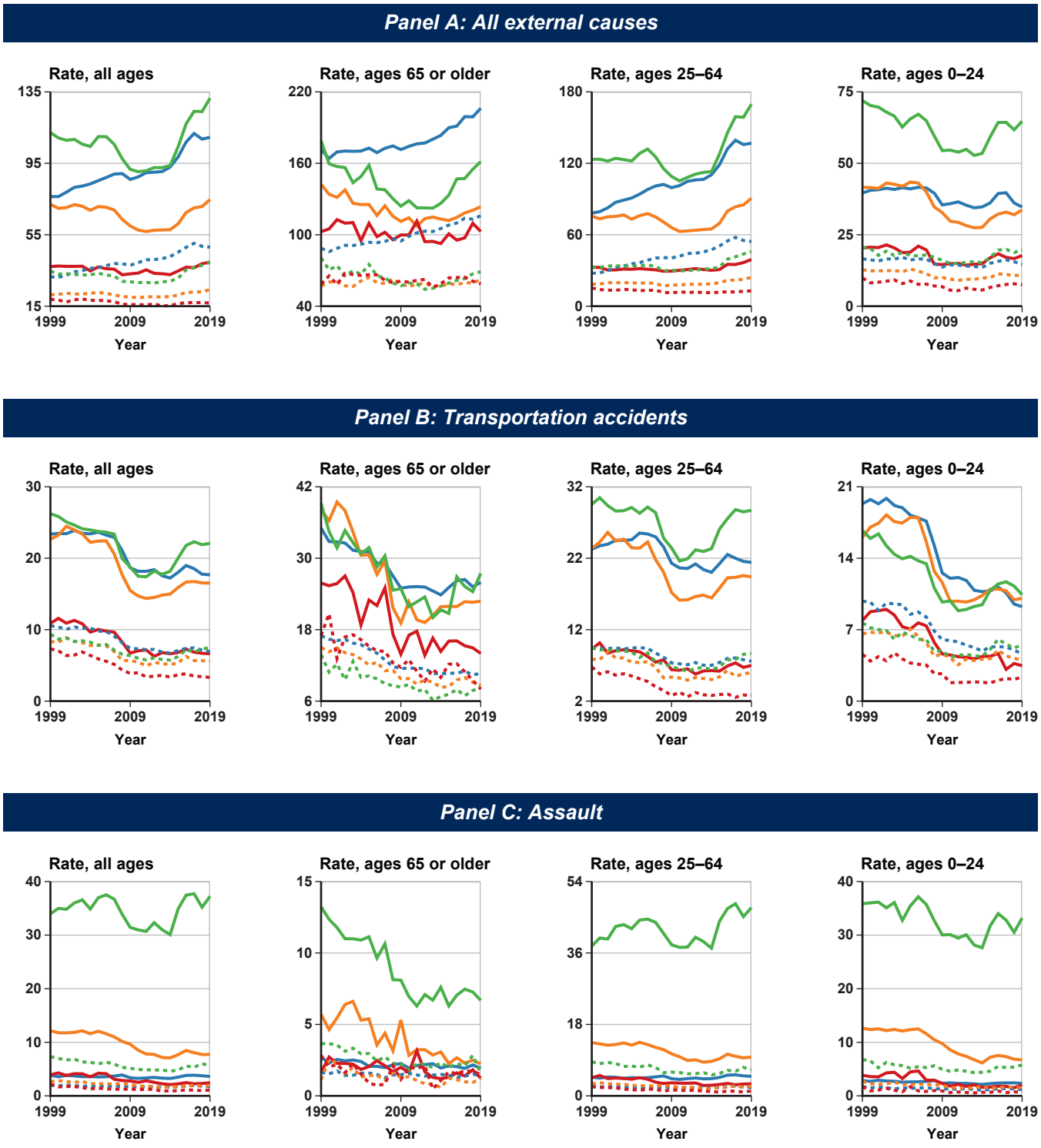
In 2014, the transportation accident mortality rate among Black males began to diverge from that of WNH males overall and at ages 25–64, opening a gap. Among those aged 65 or older, API and Black women had the lowest transportation accident mortality rates in 2019 (8.0 and 8.3, respectively), followed by Hispanic women (8.7) and WNH women (10.6), while Black men had the highest mortality rate (27.4). In 2019, API females had the lowest transportation accident mortality rate in every age group. In addition, Black men and women were the only two groups in 2019 experiencing higher transportation accident mortality rates at ages 25–64 than at ages 65 or older. In 2019, the all-ages transportation accident mortality rates for Black and Hispanic males were about three times higher than those of their female counterparts. For WNH males, the rate was about 2.5 times higher than that of WNH females, and the rate for API males was double that of API females.

In 2019, deaths caused by assault respectively accounted for 3.0 percent and 6.5 percent of external-cause deaths among the WNH and API populations. For Hispanic and Black individuals, however, assaults led to 11.3 percent and 26.3 percent, respectively, of external-cause deaths. Assaults accounted for a disproportionate share of external-cause deaths in the Black community, particularly among males, for whom it was the leading external cause of deaths over all ages combined in both 1999 and 2019.

Chart 21, Panel C shows that Black males had the highest all-ages assault death rate in all years, followed by Hispanic males and Black females. Assault death rates are inconsistent with the Hispanic paradox, as both Hispanic males and females had higher all-ages

Chart 21.
External causes: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

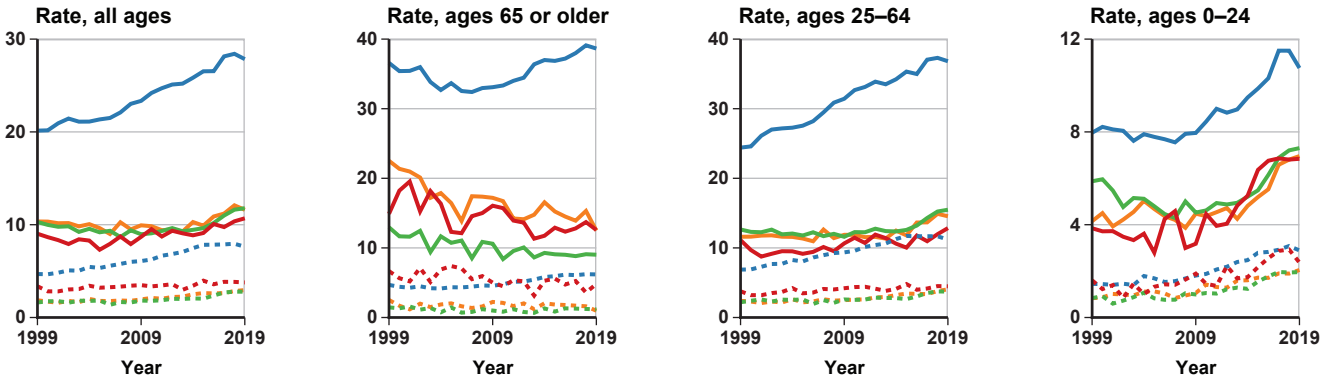


(Continued)

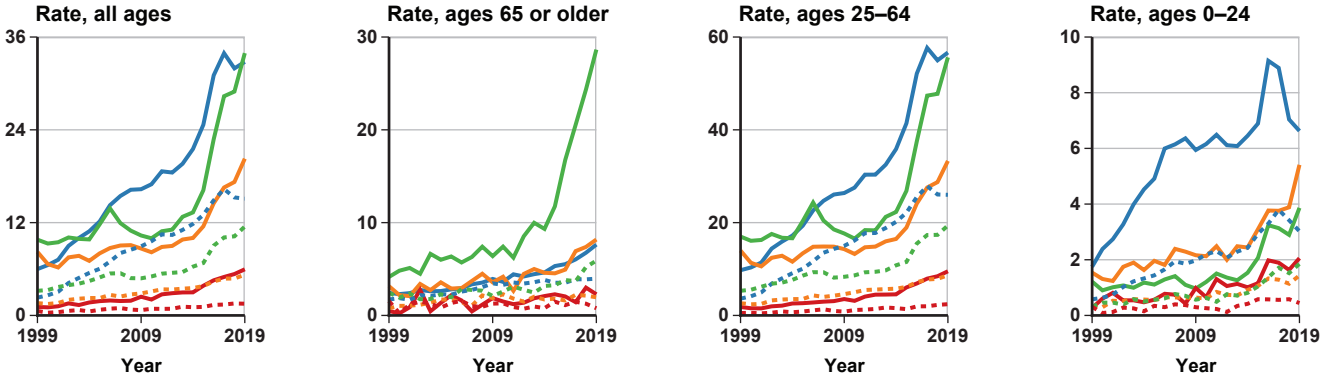
Chart 21.
External causes: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

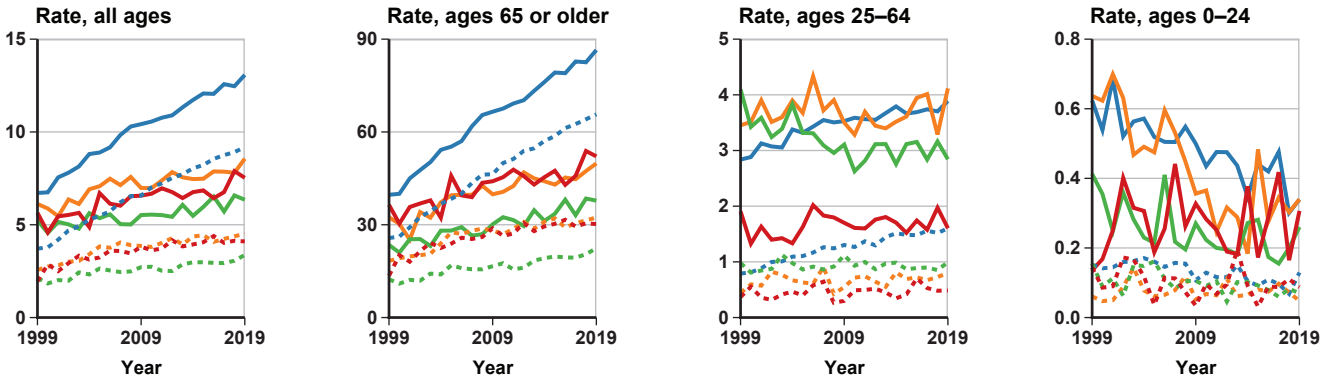
Panel D: Suicide



Panel E: Poisoning



Panel F: Falls

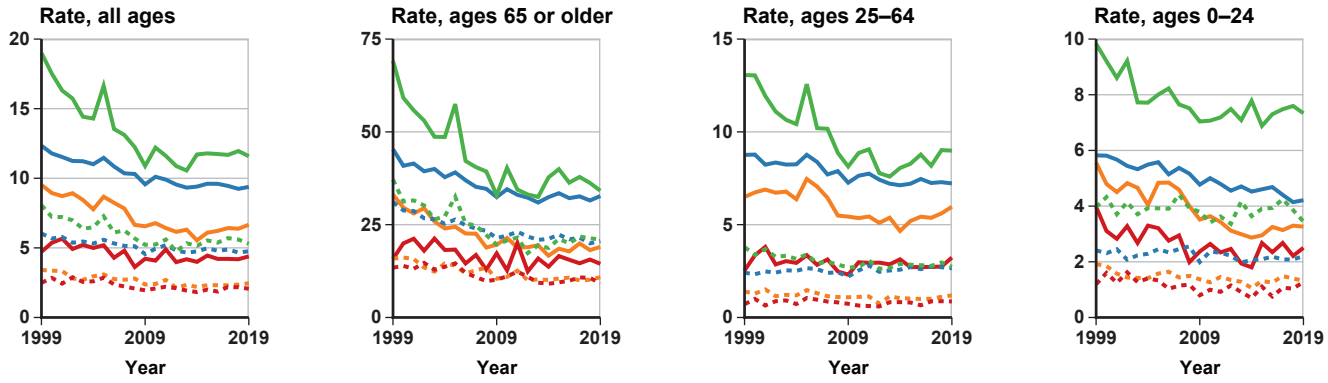


(Continued)

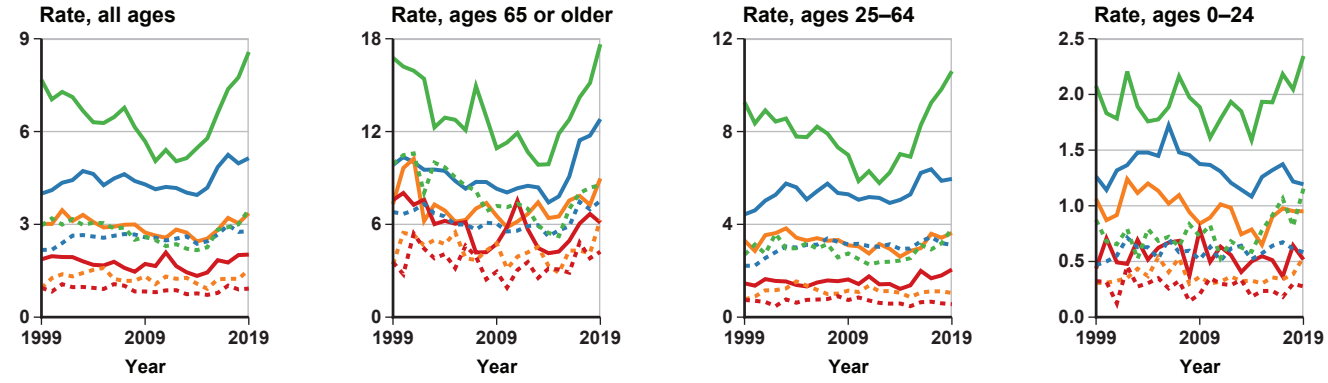
Chart 21.
External causes: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel G: Other accidents



Panel H: Other external causes



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

mortality rates than their WNH counterparts in all but 3 years. In 2019, the all-ages assault-related mortality rate for Black males (37.2) was more than 10 times that of WNH males (3.6). From 1999 to 2019, the all-ages death rate from assault declined for every RE/sex group other than Black males. Despite dropping by almost half among Black men aged 65 or older (from 13.2 to 6.7), the rate nonetheless increased significantly for those aged 25–64, from 37.7 to 47.4.

Assault-related mortality is typically highest at ages 25–64 and lowest for the aged, except that API and WNH women aged 65 or older had slightly higher rates than their counterparts aged 0–24. The assault mortality rate for API females is the lowest of any RE group in the midlife and younger ages but at ages 65 or older, it is higher than those of WNH and Hispanic women. Assault also carries interesting gender dynamics. The share of external-cause deaths that are due to assault is similar between males and females among the WNH and API populations but is substantially higher for males than females among the Hispanic and Black communities. In 2019, the all-ages assault mortality rates of API and WNH males were twice those of their female counterparts. By contrast, the all-ages assault mortality rate for Hispanic males was almost four times that of Hispanic females, and the rate for Black males was 6.5 times higher than the rate for Black females.

For all ages combined, intentional self-harm (suicide) was in 2019 the leading subcategory of external-cause deaths among API individuals (26.7 percent), the second leading subcategory for the WNH population (21.3 percent), the third leading cause in the Hispanic community (15.8 percent) and the fifth leading subcategory among the Black population (8.6 percent), following poisonings, assaults, transportation accidents, and all other accidents.

Chart 21, Panel D shows that WNH males had substantially higher all-ages death rates from suicide than those of any other RE/sex group. In 2019, the rates were 27.8 for WNH males, 11.8 for Black males, 11.6 for Hispanic males, and 10.7 for API males. From 1999 to 2019, the all-ages suicide mortality rate increased for every RE/sex group. Among females in 2019, the all-ages suicide mortality rates from highest to lowest were those for the WNH, API, Hispanic, and Black populations. At ages 0–24 and 25–64, mortality rates from suicide increased significantly across the board, but they declined at ages 65 or older, except among WNH men and women. In addition, Black men aged 65 or older had lower suicide mortality rates than men of that age in any other RE group. Suicide deaths typically accounted for a higher share of external-cause deaths among men than for women. For example, in 2019, suicides constituted 25.3 percent of all-ages external-cause deaths among WNH males, but only 13.6 percent of those for WNH females.

Since 1999, U.S. opioid overdose deaths have occurred in three compounding waves (Ciccarone 2019). The first wave is tied to natural and semisynthetic opioids, reflecting a steep increase in opioid prescriptions. The second wave is tied to heroin, to which many addicts transitioned from prescription opioids. The third wave is tied to synthetic opioids such as illicitly manufactured fentanyl. Chart 21, Panel E plots mortality rates from accidental poisoning by and exposure to noxious substances. In 2019, Black males had the highest all-ages poisoning mortality rate (33.9), followed by WNH and Hispanic males (32.8 and 20.3, respectively). However, from 2003 to 2018, the poisoning-related mortality rate was higher for WNH males than for Black males. From 1999 to 2010, the all-ages poisoning-related mortality rate for WNH males increased by 183 percent, but it remained relatively flat for Black and Hispanic males. However, during the 2011–2019 period, the death rates rose substantially for every population group except API women aged 65 or older. In 2019, the WNH and Black RE groups had the highest poisoning-related mortality rates among females.[23]

From 1999 to 2019, the increase in poisoning-related mortality for all population groups (except API women aged 65 or older) can only be described as explosive. The all-ages poisoning death rate more than doubled for API females and Hispanic males, it more than tripled for Hispanic females and for Black males and females, and it more than quintupled for API and WNH males. WNH females experienced the worst increase. In 2019 their age-adjusted mortality rate (15.1) was more than 6.5 times higher than it had been in 1999 (2.3). By 2019, poisoning became the leading external cause of death at all ages for WNH and Hispanic males and for WNH and Black females and the second leading cause of death among Black males and Hispanic females. In the midlife ages, poisoning was by far the subcategory responsible for most external-cause deaths among all RE/sex groups other than API men and women. Mortality rates rose among almost all age groups. In 2019, the poisoning-related mortality rates at ages 0–24 and 25–64 were higher for WNH males than for any other RE/sex group, but for the 65 or older age group, Black men had the

highest death rate. According to the Substance Abuse and Mental Health Services Administration (2020), fentanyl and other synthetic opioids are especially affecting the overdose death rates among older Black Americans. From 1999 to 2012, the mortality rate among Black men aged 65 or older doubled from 4.1 to 8.5. Then, in the 7-year span from 2013 to 2019, it nearly tripled, from 10.0 to 28.6. The increase in opioid-involved overdose deaths in the Black community now outpaces that of any other RE group.

Chart 21, Panel F shows the mortality rates from falls. From 1999 to 2019, all-ages fall mortality rates increased significantly for all RE/sex groups, especially for WNH males and females and API females, for whom the rates more than doubled. In 2019, the all-ages mortality rate from falls was highest among WNH males, second highest among WNH females, and lowest among Black females. For either sex, Black people had lower all-ages mortality rates from falls than API, WNH, and Hispanic individuals. In 2019, the fall-related mortality rate for WNH men aged 65 or older (86.5) was more than twice that for aged Black men (37.8). Likewise, the mortality rate from falls among aged WNH women almost tripled that of aged Black women (65.7 versus 22.4).

It is unclear why the mortality rates associated with falls at older ages have increased over time to such an extent, but the finding is consistent with the mortality trends observed in other developed countries (Hartholt and others 2019). Plausible explanations include the higher prevalence of dementia and degenerative disorders of the nervous system and the role of medications that increase the risk of falling. Shaver and others (2021) document the concurrent rise in mortality from falls and the increasing use of medications classified as "fall risk increasing drugs." These medications include anticonvulsants, antidepressants, antihypertensives, antipsychotics, benzodiazepines, opioids, sedative hypnotics, and nonprescription medications such as antihistamines. The authors found that women were more likely than men to be prescribed drugs that raised the risk of falls, particularly Black women. This appears consistent with the fact that women have experienced a higher rate of increase in mortality from falls than men but seems at odds with the substantially lower Black female mortality rate.

The subcategory named "all other accidental causes" includes death from fire, smoke, drowning, electric current, extreme temperatures, and other factors. It represents a declining percentage of external-cause deaths, with shares ranging in 2019 from 8.4 percent of all-ages external causes of death among Hispanic people to 11.0 percent among API individuals. Nevertheless, all other accidental causes account for larger shares of external-cause deaths among the oldest and youngest individuals, involving, for example, 31.2 percent of external-cause deaths among Black people aged 85 or older in 2019.

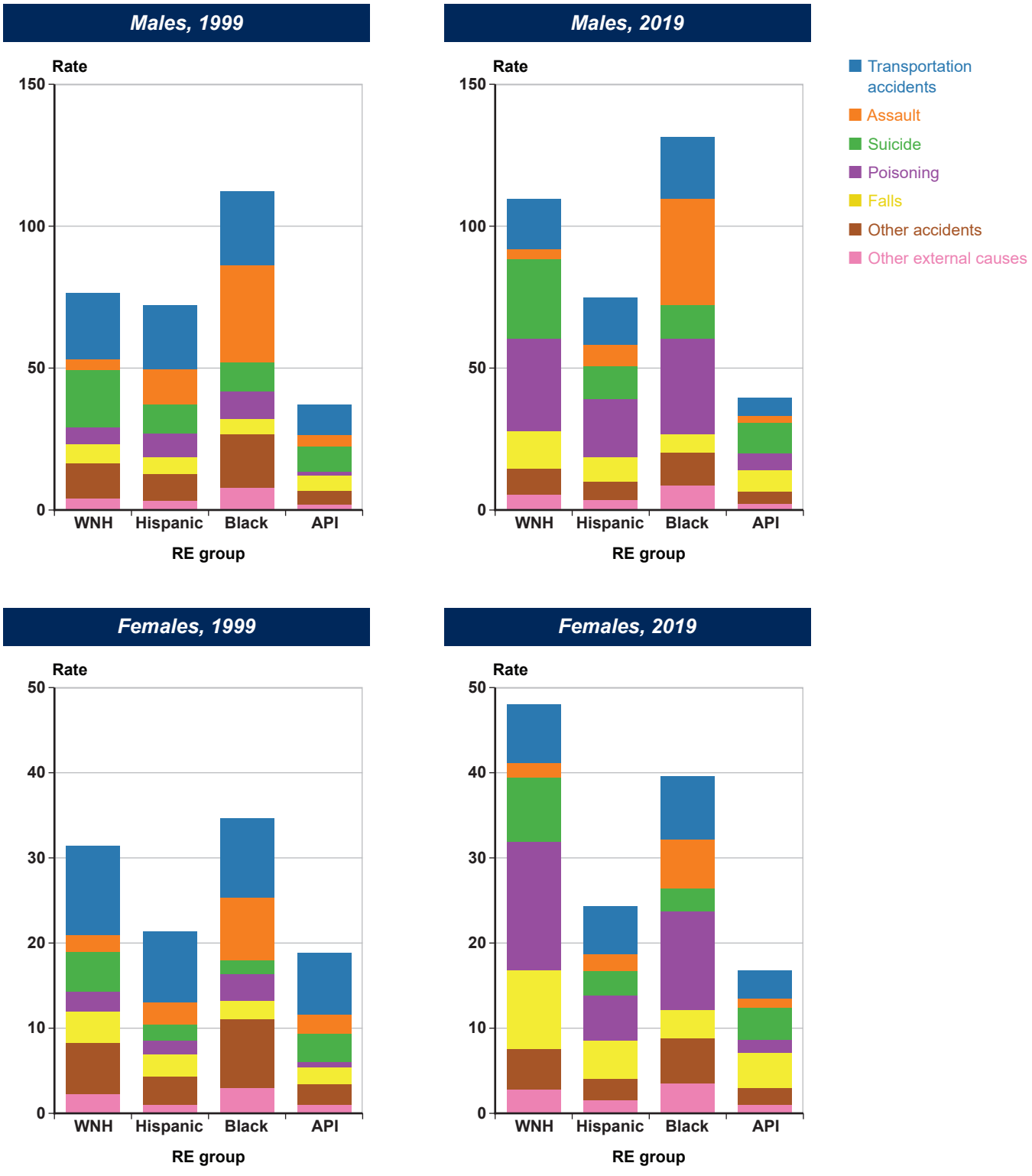
Chart 21, Panel G shows that from 1999 to 2019, mortality rates from all other accidents declined substantially for every RE/sex group, with most of the improvement occurring in the first decade. In 2019, Black males had the highest death rate in every age group, followed by WNH males. The gap between these two populations narrowed over the period. At ages 65 or older, the mortality rate for Black men declined by more than half, from 69.1 in 1999 to 34.2 in 2019. Among the RE/sex groups, Hispanic men had the third highest all-ages mortality rate from other accidental causes. However, at ages 65 or older, Black and WNH women both had higher mortality rates than Hispanic men. Among those aged 0–24, Black females had the third highest mortality rate, after Black and WNH males.

The final subcategory comprises all external causes of death that are excluded from the previous subcategories. Examples include complications of medical and surgical care, sequelae of external causes of morbidity and mortality, events of undetermined intent, and legal interventions and operations of war. Depending on the RE group, these causes account for about 4 percent to 7 percent of external-cause deaths. Chart 21, Panel H shows that all-ages mortality rates in this subcategory increased for every RE/sex group from 2014 to 2019.

In summary, external causes of mortality represent a racially and ethnically heterogenous category that has exhibited some dramatic changes over time. From 1999 to 2019, the all-ages external-cause mortality rate increased for every RE/sex group except API females. This is evident in Chart 22, which shows the contribution of each external cause-of-death subcategory to the all-ages external-cause mortality rate by RE group and sex in 1999 and 2019.

Among males in 1999, those who were Black had the highest external-cause mortality rate. Although suicide mortality for WNH males was nearly twice that of Black males, the death rate for Black males from assault alone exceeded the rate for WNH males caused by assault, transportation accidents, and poisoning combined. By contrast, for Hispanic males, the higher assault-related mortality rate in 1999 than

Chart 22.
External causes: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

that of WNH males was more than offset by a much lower suicide death rate. All-ages mortality rates for API males were substantially lower than those for any other male RE group in transportation accidents, poisoning, and all other accidents. As a result, the mortality rate from external factors for Black males in 1999 was more than triple that of API males, and for WNH and Hispanic males it was roughly double that of API males. Chart 22 does not capture the fact that by 2014, the gap in external-cause mortality rates between Black and WNH males had almost disappeared, as the latter group experienced rapid mortality rate increases driven by suicides, falls at older ages, and especially overdose and other poisonings. However, the gap widened thereafter; by 2019, Black men aged 25 or older had experienced increased transportation accident mortality and a steep rise in poisoning deaths.

Mortality patterns for females in 1999 largely mirrored those of males, generally exhibiting the same RE group rankings, but with some important differences. For instance, all-ages external-cause mortality rates for API and Hispanic females were much closer to one another (18.9 and 21.3, respectively). Similarly, the all-ages external-cause mortality rate for Black females (34.6) was much closer to that of WNH females (31.4). In 2019, the combined all-ages death rate from transportation accidents, suicides, and assaults was similar for Black and WNH females (both at about 16), as higher suicide mortality rates among WNH females were offset by a lower assault mortality rate. On the other hand, WNH female mortality rates from poisoning and falls were 1.3 and 2.7 times higher, respectively, than those of Black females. As a result, WNH females experienced a higher external-cause mortality rate than any other female RE group in 2019.

For every RE/sex group except API females, the rise in poisoning-related deaths was the primary factor contributing to higher external-cause mortality in 2019 than in 1999. If the poisoning mortality rate had stayed constant at its 1999 level, the all-ages external-cause death rate for WNH males and females would have risen nonetheless, as the decline in mortality from transportation and other accidents would have been more than offset by the rise in suicides and fall-related deaths. However, for all other RE/sex groups, external-cause mortality rates would have declined if not for the rise in poisoning-related deaths.

Diseases of the Nervous System

The proportions of all deaths that were caused by diseases of the nervous system in 2019 ranged from 5.6 percent among Black individuals to 8.8 percent in the WNH population. The share of deaths attributed to this category of causes rose significantly over the observation period and was typically higher among women than men. This section examines mortality from the eight nervous system disease subcategories listed in Box 6.

Chart 23 shows the number and percentage distribution of nervous system disease–related deaths by cause-of-death subcategory for 1999 and 2019, with detail by RE group and age. By far, Alzheimer's disease was the primary cause of death at all ages among the disorders of the nervous system, accounting in 2019 for 47.4 percent of such deaths among the Black population and more than half of them in all other RE groups. The percentages are significantly higher among women than men (consistent with Viña and Lloret 2010) and at older ages than younger ones. For instance, the shares of nervous system disease–related deaths attributed to Alzheimer's disease at ages 65 or older among WNH men and women were 44.4 percent and 63.5 percent, respectively.

Chart 24 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for nervous system diseases overall.

Chart 24, Panel B shows that WNH, Black, and Hispanic women generally had the highest all-ages Alzheimer's disease death rates, especially in the later years of the observation period. Over the entire period, API males had the lowest Alzheimer's disease mortality rates, followed by API females, whose rates were lower than those for males in all other RE groups. Females had substantially higher Alzheimer's disease mortality rates than males in each RE group and the gender gap widened over time. For either sex, WNH individuals had the highest Alzheimer's disease death rate, followed by Black and Hispanic people. From 1999 to 2019, Alzheimer's disease mortality rates rose considerably, especially among the non-WNH RE groups, for whom the rates more than doubled. For instance, all-ages Alzheimer's disease mortality rates rose by a factor of 2.5 among Black females, from 11.8 to 29.0.

In 2019, Parkinson's disease was second only to Alzheimer's disease as the leading cause of death among disorders of the nervous system for WNH, Hispanic, and API males. Unlike the share of nervous system–related deaths caused by Alzheimer's disease, that of Parkinson's disease is higher among males than females in every RE group. For instance, those percentages were 10.2 percent among WNH females, but 23.7 percent for WNH men. Based on a meta-analysis of multiple studies, Wooten and others (2004) estimated that the relative incidence risk of Parkinson's disease is 1.5 times higher for men than women.

Chart 24, Panel C shows that in 2019, WNH males had the highest all-ages Parkinson's disease mortality rate (14.3), followed by Hispanic males (9.1), API males (8.1), and Black males (7.3). The RE groups were similarly ranked among females, with the all-ages death rates ranging from 6.3 (WNH) to 3.0 (Black). From 1999 to 2019, the Parkinson's disease mortality rate increased in every RE/sex group by more than 50 percent and was more than twice as high for men as women, on average.

The subcategory labeled "other degenerative diseases of the nervous system, not elsewhere classified" (which excludes Alzheimer's disease but includes senile degeneration of the brain and degeneration of the nervous system due to alcohol) was the cause of death with the highest mortality-rate increase over the observation period. In 1999, it accounted for 1–3 percent of nervous system disease–related deaths, depending on the RE group (Chart 23). By 2019, however, it exceeded the share of nervous system disease–related deaths caused by Parkinson's disease for females in all RE groups, ranging from 12.1 percent

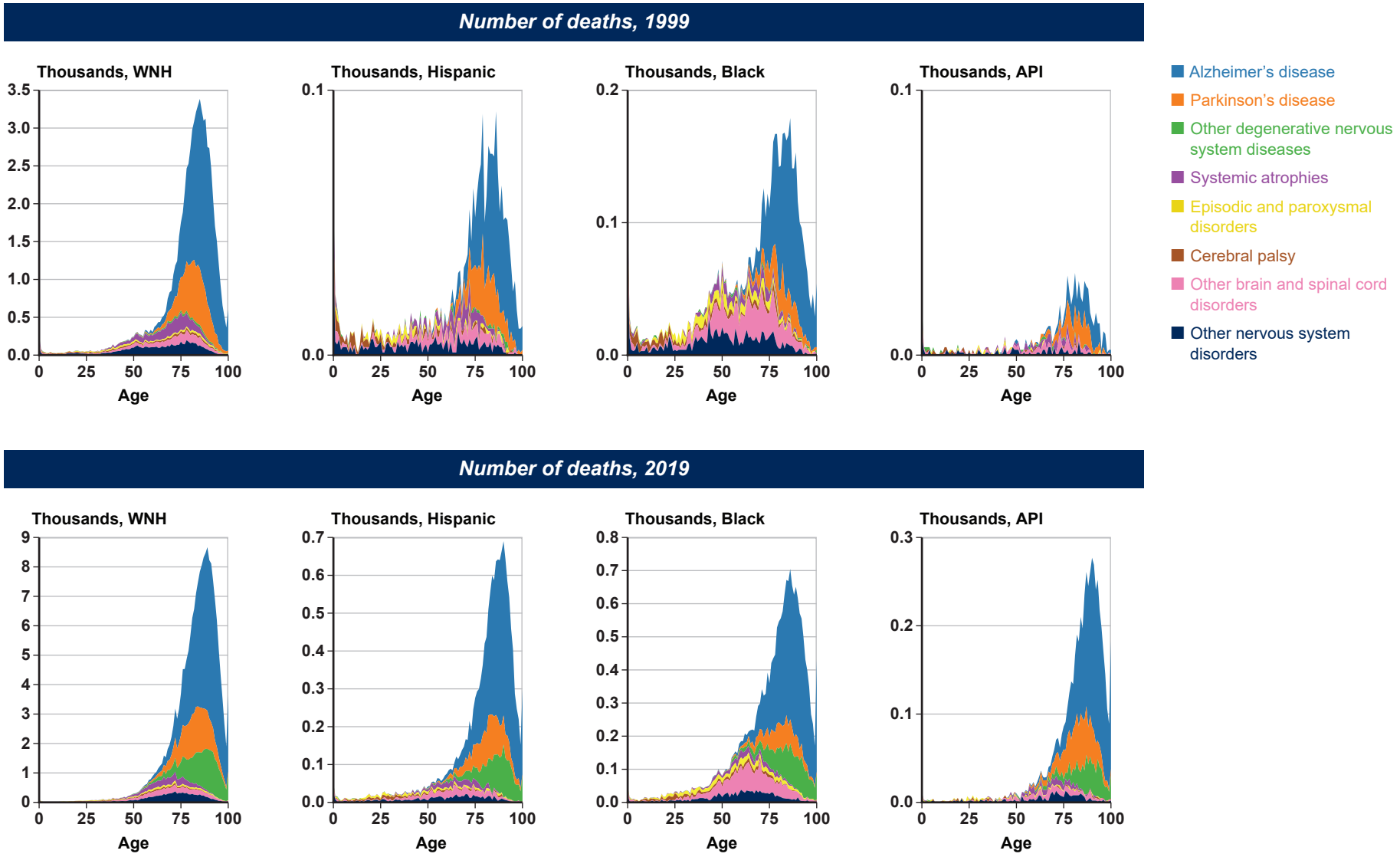
Box 6.
Nervous system disease cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Alzheimer's disease	Alzheimer's disease	G30
Parkinson's disease	Parkinson's disease	G20
Other degenerative diseases of the nervous system, not elsewhere classified	Other degenerative nervous system diseases	G31
Systemic atrophies primarily affecting central nervous system	Systemic atrophies	G10–G14
Episodic and paroxysmal disorders	Episodic and paroxysmal disorders	G40–G47
Cerebral palsy and other paralytic syndromes	Cerebral palsy	G80–G83
Other disorders of the brain and spinal cord	Other brain and spinal cord disorders	G93, G95
All other nervous system disorders	Other nervous system disorders	. . .
Inflammatory diseases of the central nervous system (including meningitis, encephalitis, and myelitis)	. . .	G00–G09
Diseases of myoneural junction and muscle	. . .	G70–G73
Polyneuropathies and other disorders of the peripheral nervous system	. . .	G60–G65
Nerve, nerve root, and plexus disorders	. . .	G50–G59
Demyelinating diseases of the central nervous system	. . .	G35–G37
Secondary parkinsonism	. . .	G21
Other degenerative diseases of the basal ganglia	. . .	G23
Dystonia	. . .	G24
Extrapyramidal and movement disorders in diseases classified elsewhere	. . .	G26
Other extrapyramidal and movement disorders	. . .	G25
Disorders of the autonomic nervous system	. . .	G90
Hydrocephalus	. . .	G91
Toxic encephalopathy	. . .	G92
Other disorders of the central nervous system	. . .	G96
Any other disorders of the nervous system, not elsewhere classified	. . .	G98

SOURCE: ICD-10.

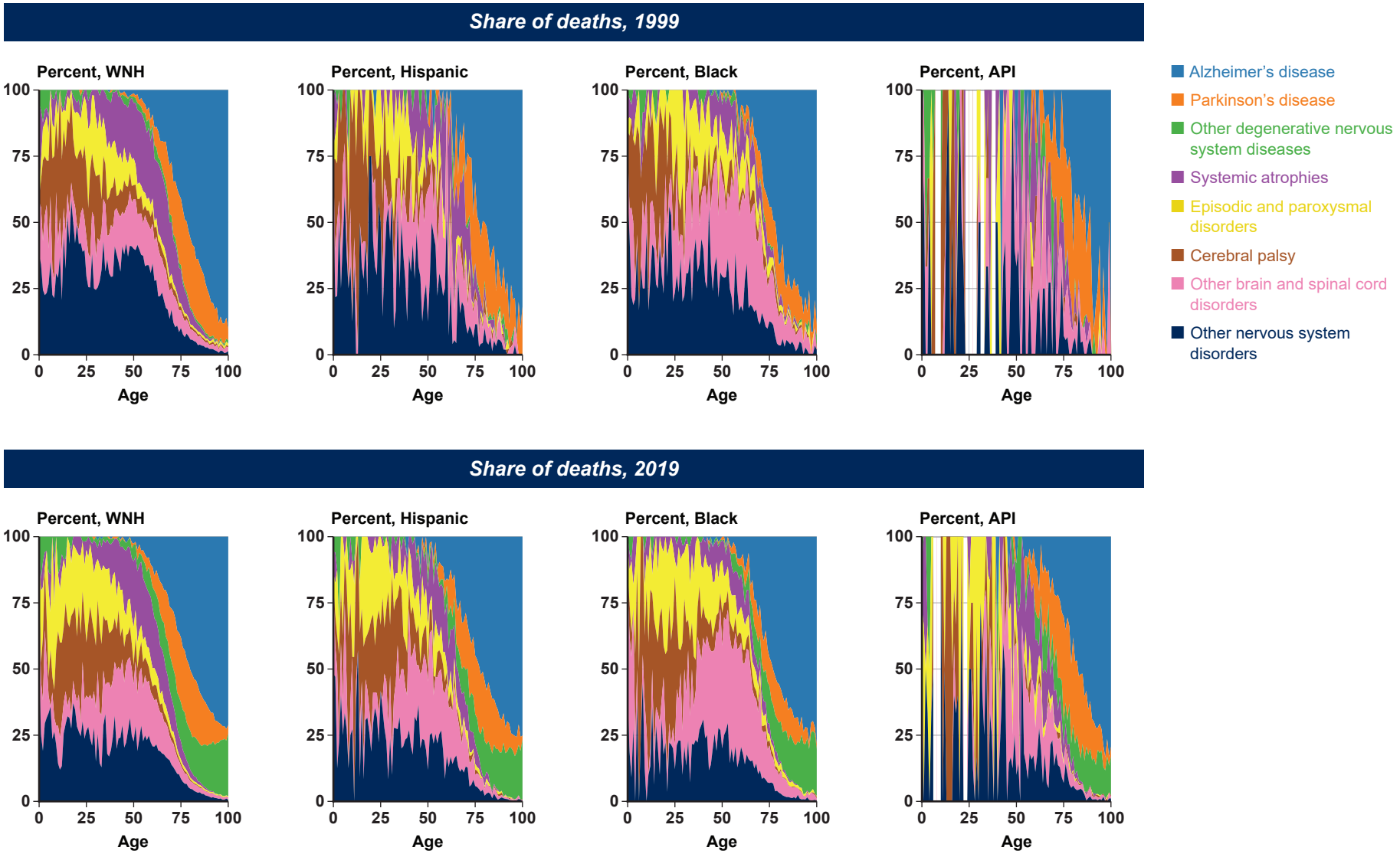
NOTE: . . . = not applicable.

Chart 23.
Nervous system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019



(Continued)

Chart 23.
Nervous system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*

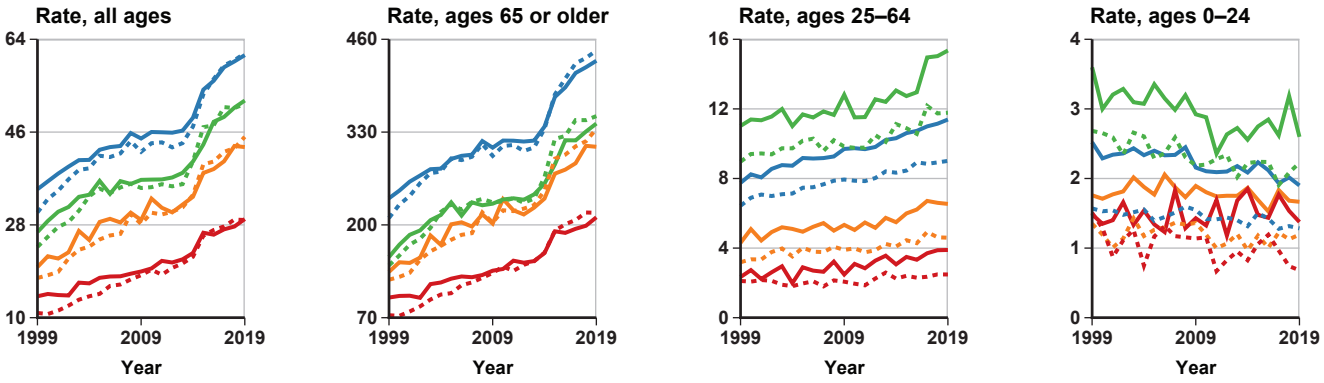


SOURCE: Author's calculations based on CDC WONDER.

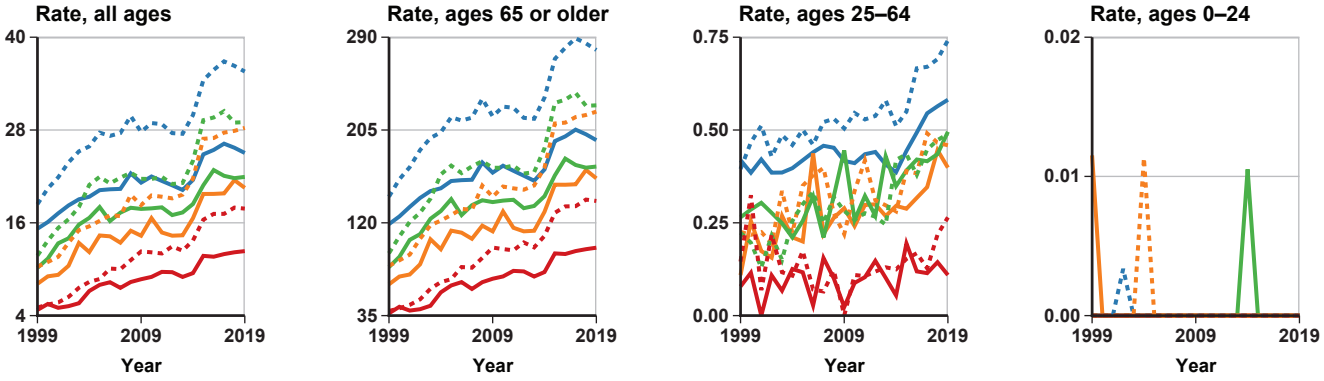
Chart 24.
Nervous system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

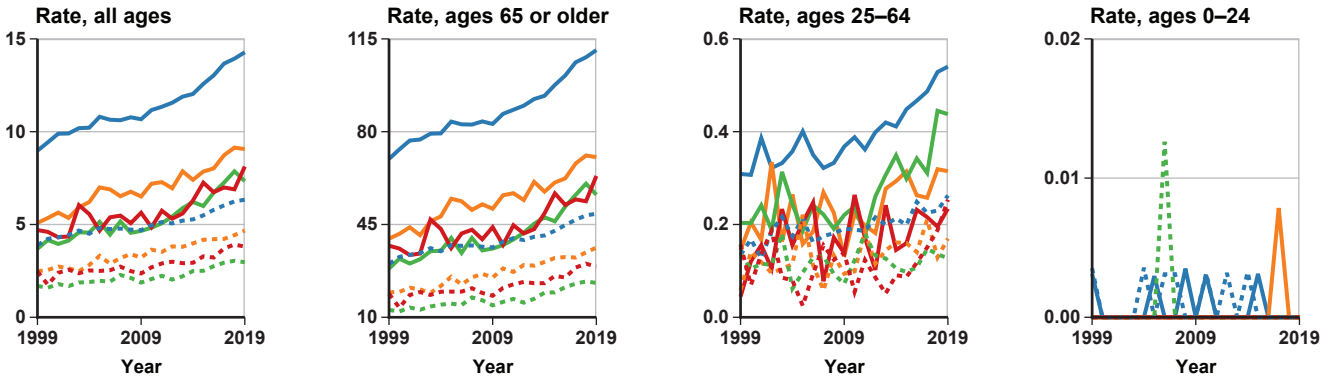
Panel A: All nervous system diseases



Panel B: Alzheimer's disease



Panel C: Parksinson's disease

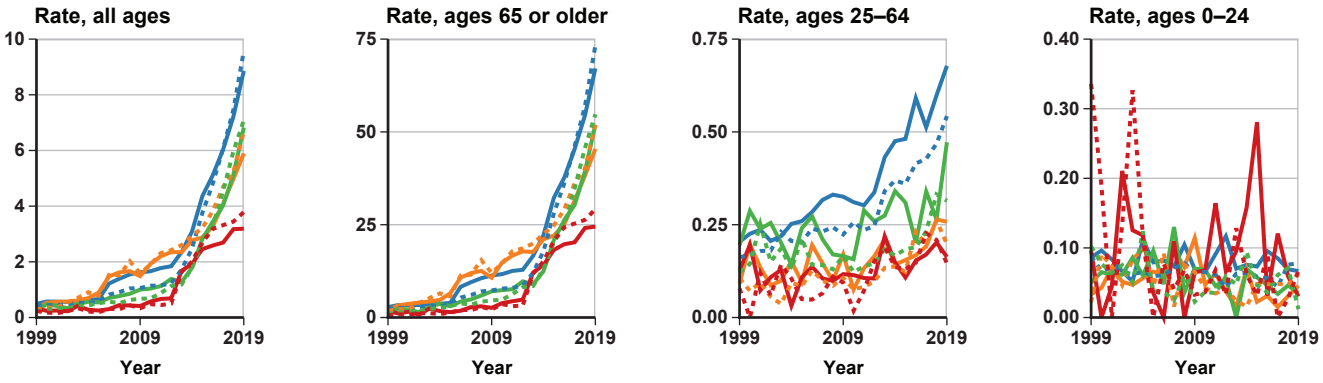


(Continued)

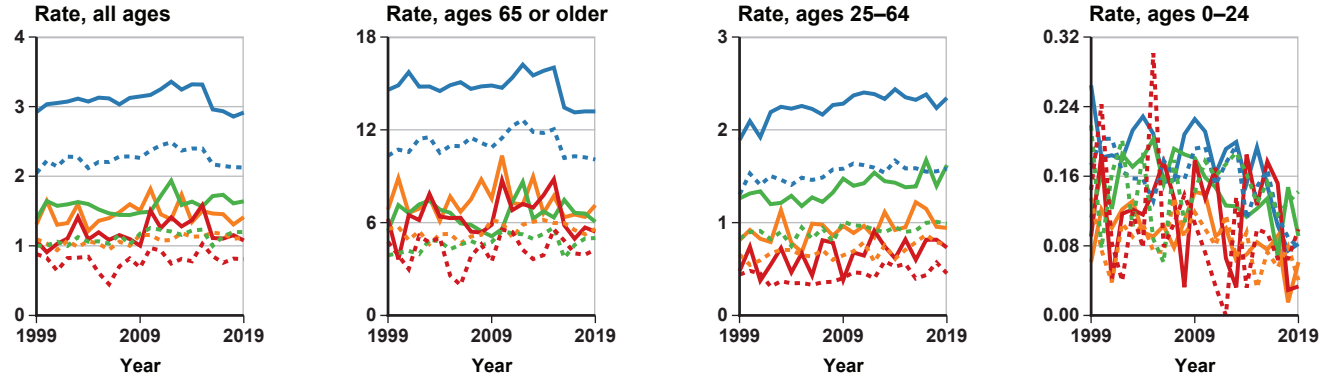
Chart 24.
Nervous system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

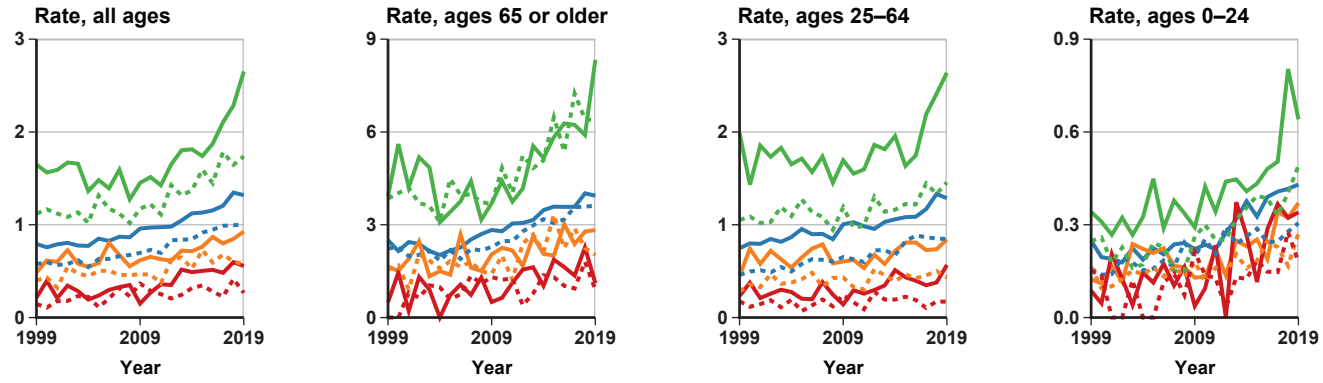
Panel D: Other degenerative nervous system diseases



Panel E: Systemic atrophies



Panel F: Episodic and paroxysmal disorders

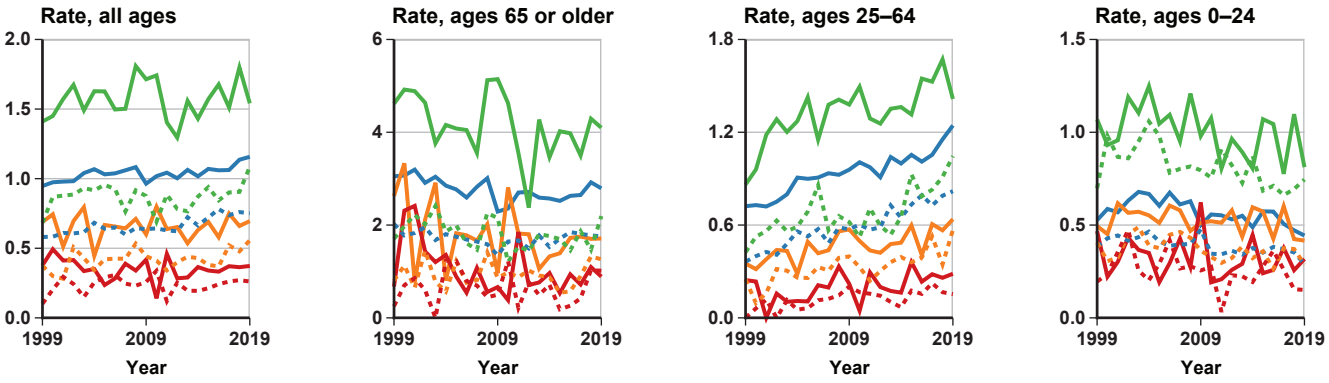


(Continued)

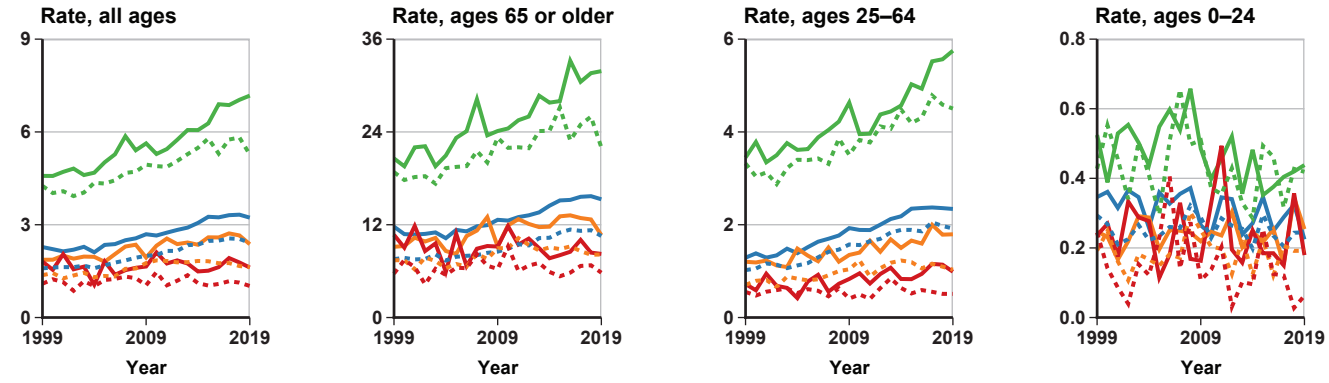
Chart 24.
Nervous system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

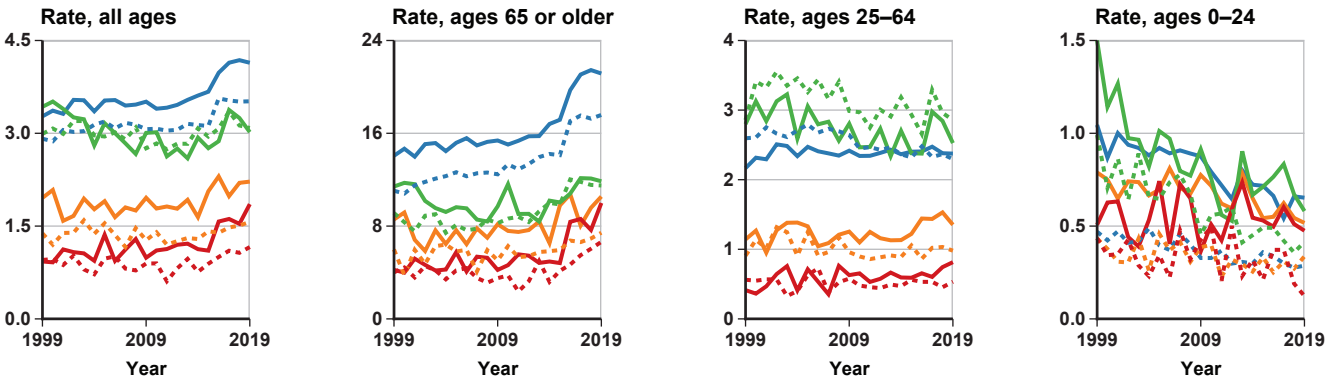
Panel G: Cerebral palsy



Panel H: Other brain and spinal cord disorders



Panel I: Other nervous system disorders



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

of such deaths among API females to 15.5 percent of them among WNH females.

Chart 24, Panel D shows that the other degenerative nervous system disease mortality rates rose dramatically through the entire 1999–2019 period, driven largely by explosive increases in the 65 or older age group, particularly after 2012.[24] API males and females had the lowest increases in all-ages mortality rates in this subcategory over the entire period, yet still they rose by factors of 10.7 and 19.0, respectively. All-ages mortality rates from degenerative nervous system diseases not elsewhere classified rose from 0.5 to 8.9 for WNH males (an 18-fold increase) and rose by a factor of 24 among WNH women. Hispanic males and females experienced mortality rate increases like those of their WNH counterparts, while the rates for Black males and females increased the most, by factors of 22.7 and 35.5, respectively. For each RE group, females had higher all-ages mortality rates than males in 2019. WNH females and males experienced the highest death rates, followed by Black females and males.

Alzheimer's disease, Parkinson's disease, and other degenerative diseases of the nervous system collectively dominate nervous system disorder mortality at ages 65 or older. Because most deaths from nervous system diseases occur at older ages, those three subcategories also account for the overwhelming majority of nervous system disorder–related deaths over all ages combined, constituting more than two-thirds of such deaths in the Black population and more than 80 percent of those for the other RE groups. Nevertheless, other subcategories account for higher shares of nervous system disease–related deaths among people in the midlife and younger ages than among the aged. For example, depending on the RE group, systemic atrophies primarily affecting the central nervous system (such as Huntington's disease and spinal muscular atrophy) accounted for 3–4 percent of nervous system disease–related deaths over all ages combined in 2019. Yet in the midlife ages, systemic nervous system atrophies represented almost 20 percent of nervous disorder deaths among the WNH and API populations, 15.1 percent of those among Hispanic people, and 9.7 percent of those in the Black community.

Chart 24, Panel E shows that at all ages combined, WNH males in 2019 had the highest all-ages systemic atrophies mortality rates across the observation period, followed by WNH females, while API females experienced the lowest mortality rates. For WNH people of both sexes, the all-ages systemic atrophies death rate was 1.8 times that of their Black counterparts. Over the 1999–2019 period, the systemic atrophies death rates remained relatively stable for each RE/sex group.

Episodic and paroxysmal disorders (such as epilepsy and recurrent seizures and migraines) represented a relatively infrequent cause of nervous system disease–related death, accounting in 2019 for 1.5 percent of such deaths in the WNH and API communities, 2.4 percent of those among Hispanic people, and 4.7 percent of such deaths among Black individuals. However, at ages 0–24, it was a leading cause of nervous system disease–related death, accounting for roughly one-quarter of all such deaths in this age group.

Chart 24, Panel F shows that in 2019, Black males and females had the highest all-ages episodic and paroxysmal disorder death rates, followed by WNH males and females; API females and males had the lowest death rates. The all-ages episodic and paroxysmal disorder mortality rate for Black males in 2019 was twice that of WNH males (2.7 versus 1.3). Over the 1999–2019 period, mortality rates rose in all population groups except API women aged 25–64, for whom it remained essentially unchanged.

The all-ages shares of nervous system disease–related deaths attributed to causes in the cerebral palsy and other paralytic syndromes subcategory, which includes paraplegia and quadriplegia, ranged in 2019 from 1.2 percent in the WNH and API communities to 3.0 percent for Black people. This subcategory's share of such deaths has declined over time, is higher among males than females, and is higher at ages 0–64 than at ages 65 or older. It accounts for about one-third of nervous system disease–related deaths at ages 0–24 among Black individuals and close to one-quarter of such deaths for the other RE groups in that age range.

Chart 24, Panel G shows that Black males experienced the highest all-ages cerebral palsy death rate in 2019, followed by WNH males and Black females. All-ages cerebral palsy mortality rates were higher in 2019 than in 1999 for all RE/sex groups other than Hispanic and API males, whose rates were essentially unchanged.

The all-ages share of nervous system disease–related deaths attributed to the "other disorders of the brain and spinal cord" subcategory ranged from 4.2 percent among WNH individuals to 13.5 percent

in the Black population. Anoxic brain injury (which occurs when the brain is deprived of oxygen) accounted for more than 60 percent of the deaths in this subcategory. For Black males, this was the second leading all-ages cause of nervous system disease mortality, accounting for more deaths in 2019 than Parkinson's disease and other degenerative diseases of the nervous system. Other disorders of the brain and spinal cord were the leading cause of nervous system disease–related death at ages 25–64 for men of the non-WNH RE groups and for Black and Hispanic women, and were the second leading cause for API and WNH women at these ages.

Chart 24, Panel H shows that Black males had the highest all-ages other brain and spinal cord disorder death rates across the period, followed by Black females and WNH males. From 1999 to 2019, all-ages other brain and spinal cord disorder death rates increased for all RE/sex groups except API males and females. Mortality rates rose by more than 50 percent for Black males (from 4.6 to 7.2) and WNH females (from 1.6 to 2.4).

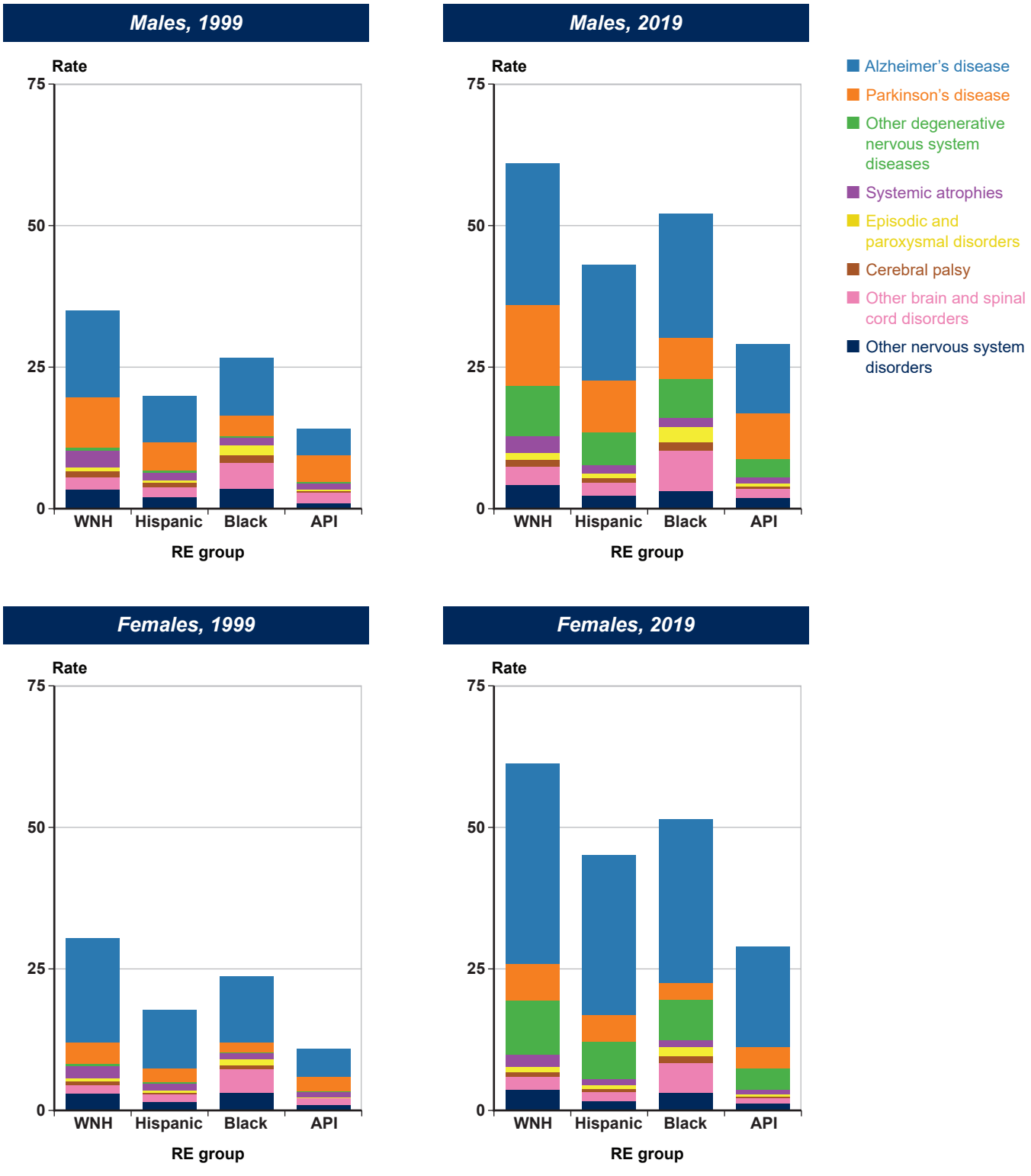
The residual subcategory labeled "all other nervous system disorders" includes inflammatory diseases of the central nervous system (such as meningitis or encephalitis); diseases of myoneural junctions and muscles; polyneuropathies and other disorders of the peripheral nervous system; nerve, nerve root, and plexus disorders; demyelinating diseases of the central nervous system; secondary parkinsonism; other degenerative diseases of basal ganglia; dystonia; extrapyramidal and movement disorders in diseases classified elsewhere; other extrapyramidal and movement disorders; and various other disorders of the nervous system not classified elsewhere. More than half of the deaths in this subcategory were attributed to disorders of the nervous system not elsewhere classified. In 2019, the disorders in this subcategory accounted for 5–7 percent of nervous system disease–related deaths, depending on the RE group. Regardless of RE group. this subcategory represented a substantially higher proportion of nervous system disease–related deaths in the midlife ages and at younger ages than at ages 65 or older.

Chart 24, Panel I shows that in 2019, WNH males had the highest all-ages all other nervous system disease mortality rate (4.1), followed by WNH females (3.5) and Black females and males (3.1 and 3.0, respectively). In 2019, all-ages other nervous system disease mortality rates among WNH people of either sex were higher than those of their Black counterparts, extending an existing mortality gap between the two RE groups that was driven primarily by mortality experience at ages 65 or older. For instance, from 1999 to 2019, mortality rates among WNH women aged 65 or older rose from 11.0 to 17.6, while for Black women of those ages, they rose only from 9.1 to 11.5.

Chart 25 shows the all-ages nervous system disease mortality rates by cause-of-death subcategory, RE group, and sex in 1999 and 2019. In 1999, death rates were slightly higher for males than for females in the same RE group. By 2019, mortality rates had increased substantially among all RE/sex groups, and by similar magnitudes. For instance, the mortality rates for WNH males and females in 2019 were 60.9 and 61.3, respectively. Similarly, death rates for Black males and females in 2019 were 52.1 and 51.5, respectively. The similarity is surprising, considering the substantial compositional differences: Females experienced higher mortality from Alzheimer's disease and other degenerative diseases of the nervous system, while males had higher death rates from Parkinson's disease and other disorders of the brain and spinal cord.

For WNH males and females, the combined mortality rates from Alzheimer's disease, Parkinson's disease, and other degenerative diseases of the nervous system were significantly higher than those for any other RE group, far offsetting the higher mortality among the Black population associated with other disorders of the brain and spinal cord, episodic and paroxysmal disorders, and cerebral palsy and other paralytic syndromes. A comparison of mortality rates between Black and Hispanic individuals is also interesting, revealing that the disproportionately high mortality rate for other disorders of the brain and spinal cord in the Black population was one of the main factors affecting mortality differentials between the two groups in 2019. At the other end of the spectrum, the death rates from all diseases of the nervous system in the API population were lower than the combined mortality rate from only the two primary causes, Alzheimer's and Parkinson's diseases, in all other RE groups, regardless of sex.

Chart 25.
Nervous system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Endocrine, Nutritional, and Metabolic Diseases

As discussed earlier, the share of deaths caused by endocrine, nutritional, and metabolic diseases increased over the observation period, accounting in 2019 for 4.5 percent of all deaths in the WNH community and 6.5 percent of deaths among the Hispanic and Black populations. This section discusses the five endocrine, nutritional, and metabolic disease subcategories listed in Box 7.

Chart 26 shows the number and percentage distribution of endocrine, nutritional, and metabolic disease–related deaths by subcategory for 1999 and 2019, with detail by RE group and age. The leading cause of endocrine, nutritional, and metabolic disease–related death, by far, is diabetes mellitus, which in 1999 accounted for 71.0 percent of all deaths in that category among WNH individuals, 79.6 percent of those deaths among the Black population, 81.8 of such deaths among API people, and 85.8 percent of those deaths in the Hispanic community. The percentage of endocrine, nutritional, and metabolic disease deaths caused by diabetes typically peaks toward the end of the midlife ages, in the 50s and early 60s. It declined over the 1999–2019 period, as other diseases such as obesity, malnutrition, and metabolic disorders accounted for rising shares of deaths in the category.

Chart 27 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for endocrine, nutritional, and metabolic diseases overall.

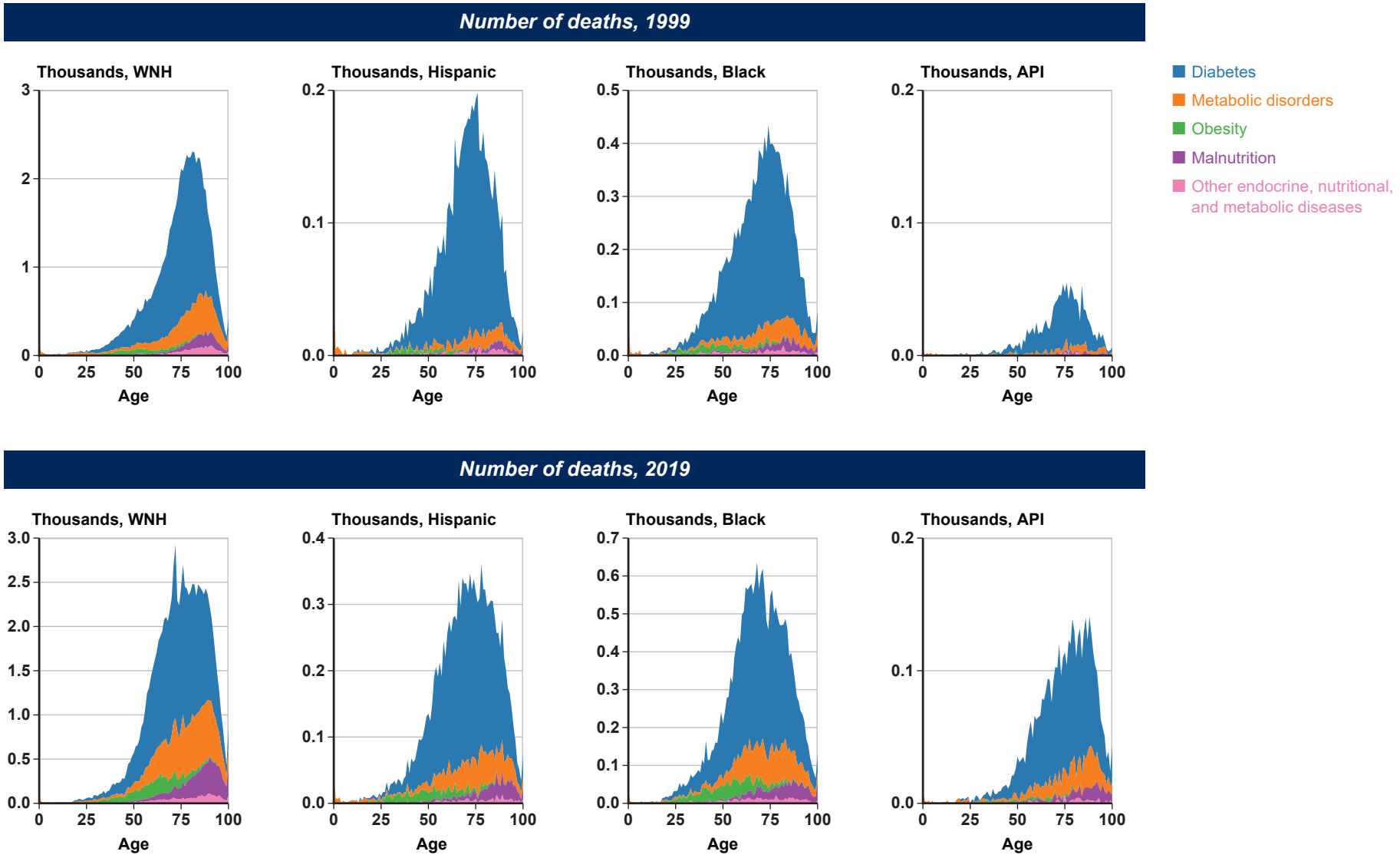
Chart 27, Panel B shows that in 2019, the all-ages diabetes death rate was highest for Black males (45.1), followed by Hispanic males (31.2) and Black females (31.1). Prior to 2019, however, the diabetes death rate for Black females had exceeded that of Hispanic males. Similarly, Hispanic females had higher all-ages diabetes mortality rates than WNH males from 1999 until 2013. API and WNH females had the lowest all-ages diabetes mortality rates in 2019 (about 14). From 1999 to 2019, all-ages diabetes mortality rates declined for all RE/sex groups other than API males, dropping most sharply for Hispanic and Black females. For instance, during this period, the all-ages diabetes mortality rate for Black females declined from 49.5 to 31.1, driven largely by a steep drop in the 65 or older age group. During the second half of the period (2010–2019), the death rate associated with diabetes rose among people aged 25–64 in every RE/sex group. Notably, diabetes mortality rates during the 1999–2019 period improved much faster among females than males, widening a preexisting mortality gap. For instance, the WNH male-to-female mortality ratio for diabetes was 1.3 in 1999 and 1.7 by 2019.

Box 7.
Endocrine, nutritional, and metabolic disease cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Diabetes mellitus	Diabetes	E10–E14
Metabolic disorders	Metabolic disorders	E70–E88
Obesity and other hyperalimentation	Obesity	E65–E68
Malnutrition	Malnutrition	E40–E46
All other endocrine, nutritional, and metabolic diseases	Other endocrine, nutritional, and metabolic diseases	. . .
Disorders of the thyroid gland	. . .	E00–E07
Other disorders of glucose regulation and pancreatic internal secretion	. . .	E15–E16
Disorders of other endocrine glands	. . .	E20–E34
Other nutritional deficiencies	. . .	E50–E64

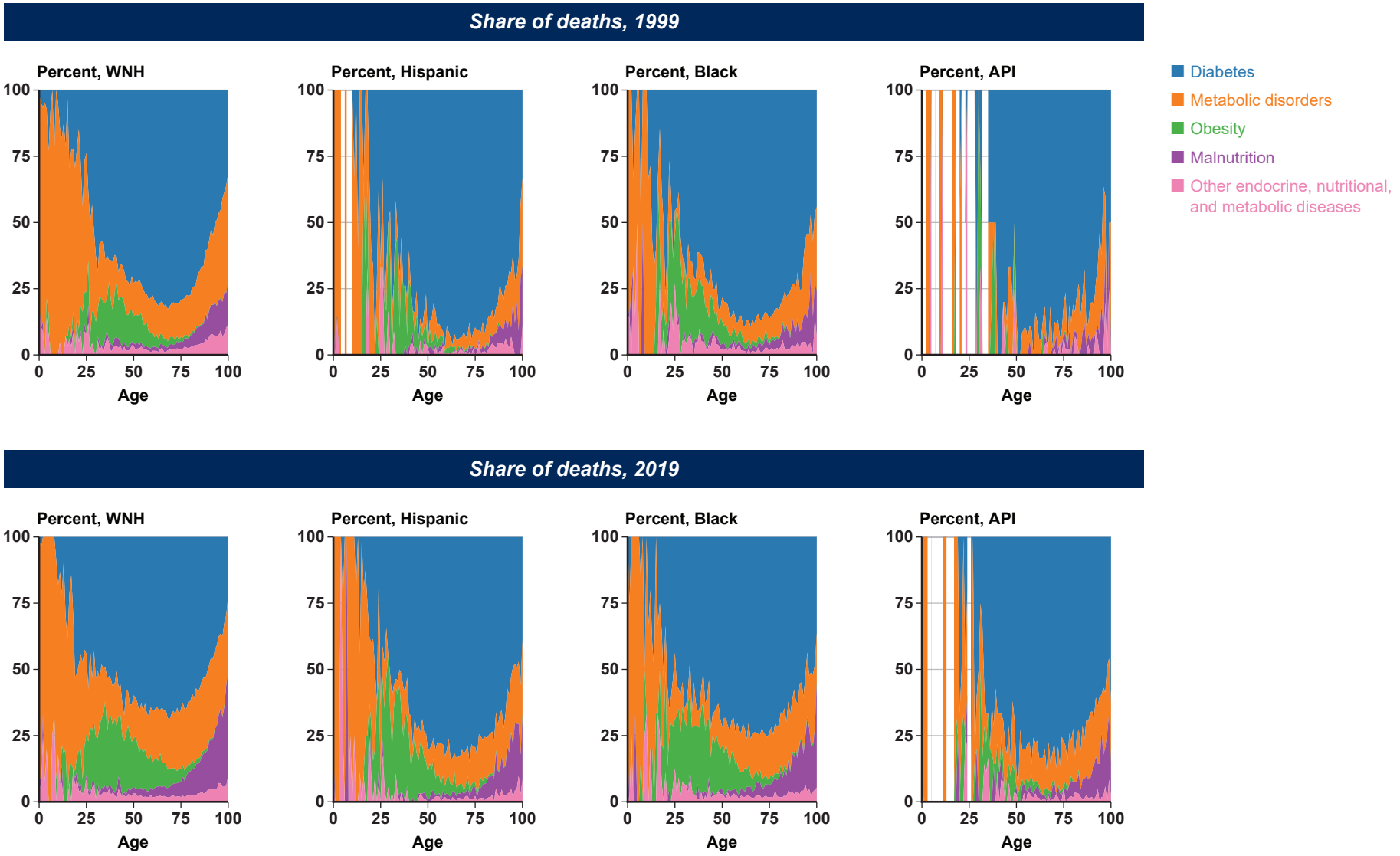
SOURCE: ICD-10.
NOTE: . . . = not applicable.

Chart 26.
Endocrine, nutritional, and metabolic diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019



(Continued)

Chart 26.
Endocrine, nutritional, and metabolic diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*

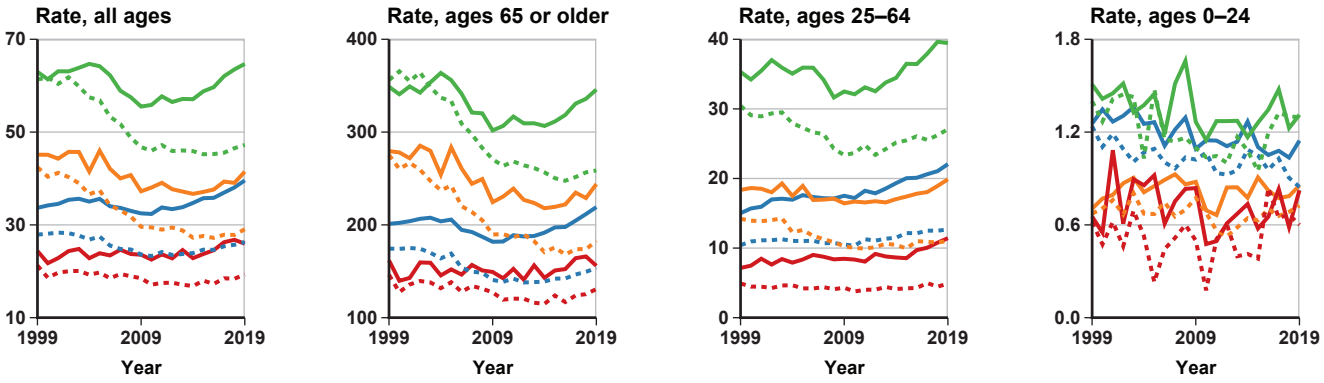


SOURCE: Author's calculations based on CDC WONDER.

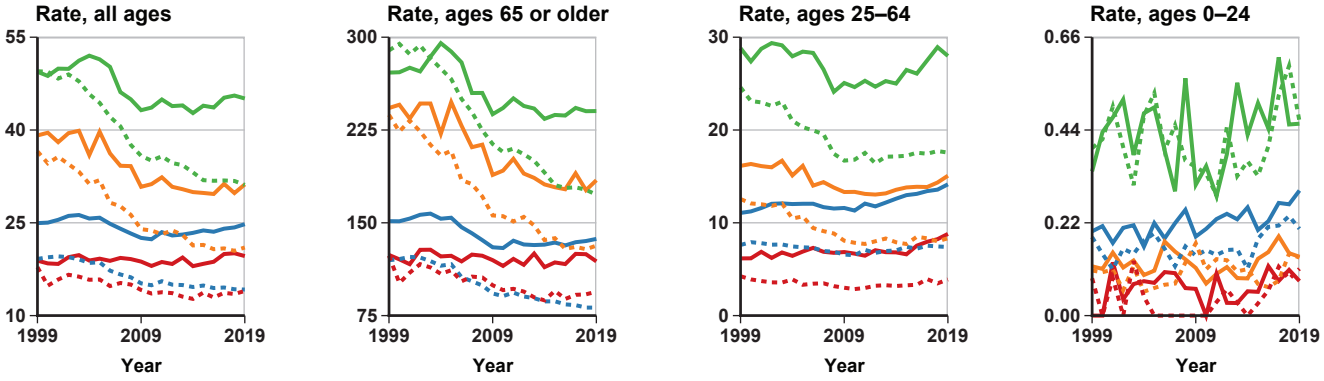
Chart 27.
Endocrine, nutritional, and metabolic diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

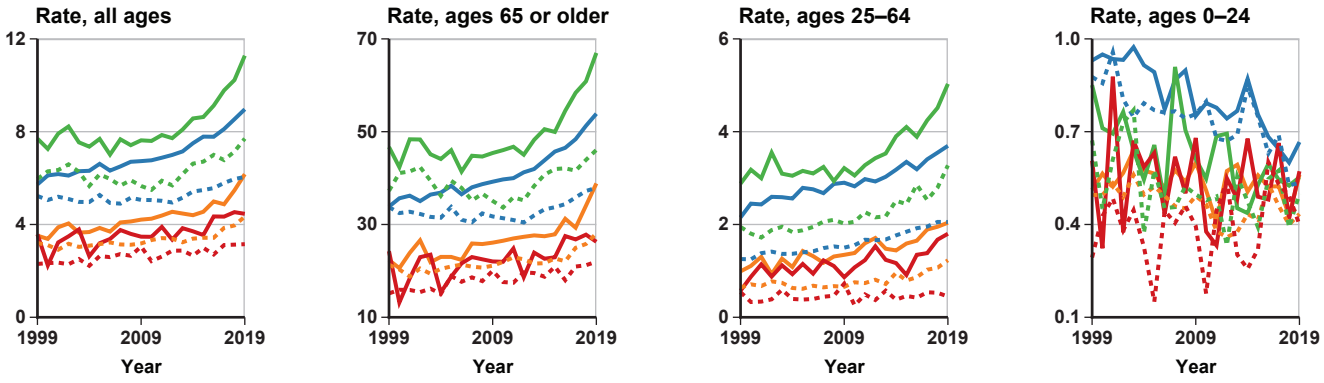
Panel A: All endocrine, nutritional, and metabolic diseases



Panel B: Diabetes



Panel C: Metabolic disorders

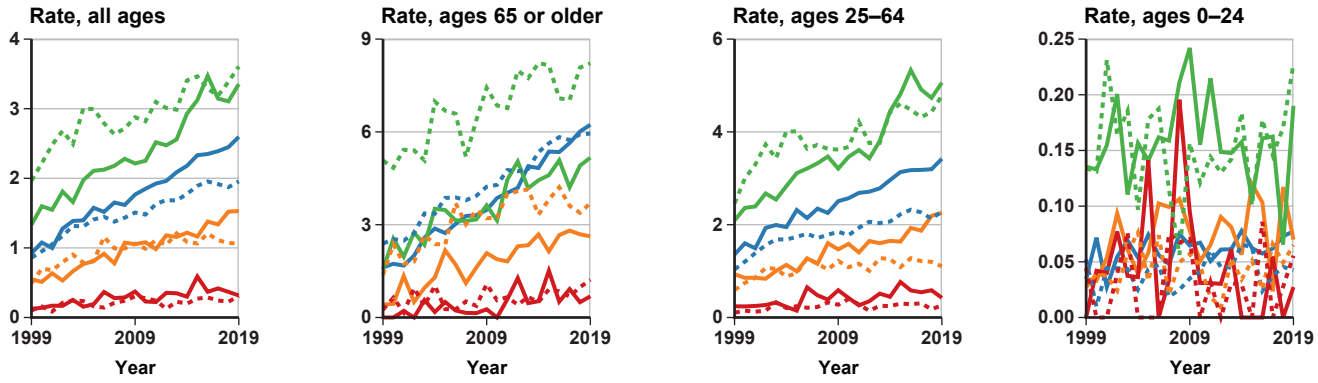


(Continued)

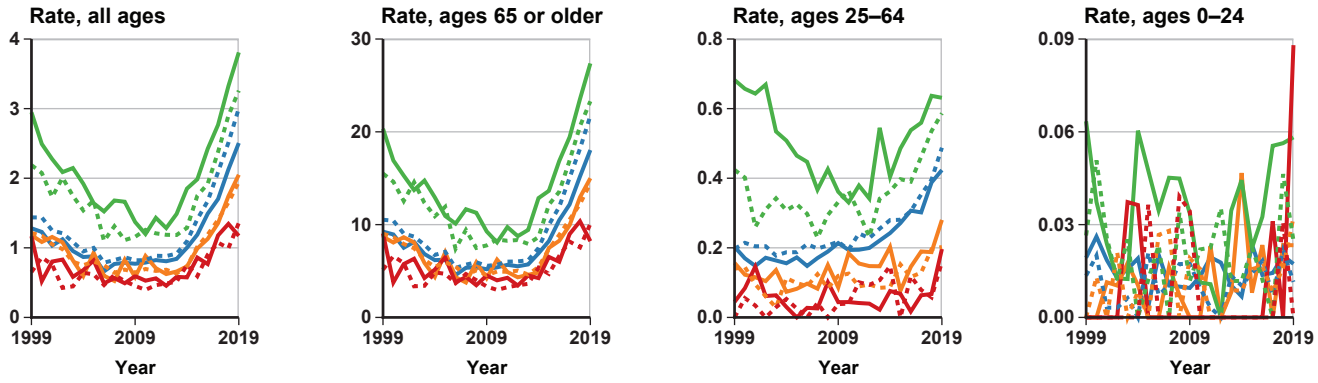
Chart 27.
Endocrine, nutritional, and metabolic diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

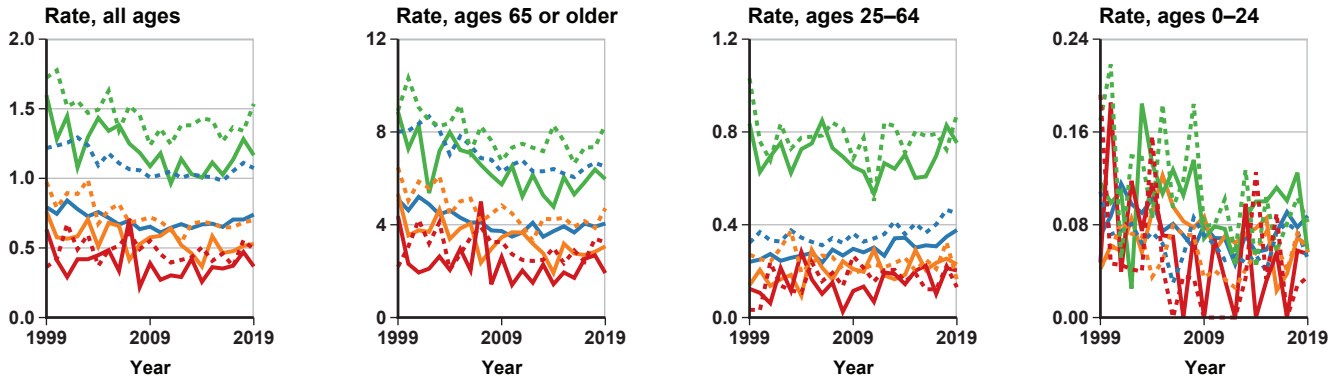
Panel D: Obesity



Panel E: Malnutrition



Panel F: Other endocrine, nutritional, and metabolic diseases



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Metabolic disorders represent the second leading cause of endocrine, nutritional, and metabolic disease deaths after diabetes. In 2019, about 51 percent of deaths in this subcategory involved disorders of lipoprotein metabolism (such as hyperlipidemia), while another 20.5 percent entailed other disorders of fluid, electrolyte, and acid-base balance (such as acidosis, wherein the body fluids are too acidic). The share of endocrine, nutritional, and metabolic disease deaths that was caused by metabolic disorders increased substantially over the observation period and by 2019, for all ages combined, it ranged from 14.5 percent in the Hispanic community to 23.0 percent in the WNH population. Metabolic disorders account for higher percentages of endocrine, nutritional, and metabolic disease deaths at ages 65 or older than in the midlife years, yet the highest shares affect the young. For the 0–24 age group, metabolic disorders are the leading cause of death in this category, causing about 40 percent of those among Black people, more than half of such deaths among the WNH and Hispanic communities, and two-thirds of those among API individuals.

Chart 27, Panel C shows that from 1999 to 2019, mortality rates for metabolic disorders rose significantly in the midlife and older age groups for all RE/sex groups (except API women aged 25–64). The all-ages metabolic disorder death rate in 2019 was highest for Black males (11.3), followed by WNH males (9.0) and Black females (7.7). WNH females had higher all-ages metabolic disorder mortality rates than Hispanic males until 2019, when the two rates converged at about 6. Hispanic and API females had the lowest all-ages metabolic disorder mortality rates (4.3 and 3.2, respectively).

From 1999 to 2019, the percentage of endocrine, nutritional, and metabolic disease deaths caused by obesity and other hyperalimentation disorders more than doubled for every RE group. In 2019, the share of deaths in this category that were associated with obesity ranged from 1.5 percent among API people to 6.9 percent in the Black community. The proportion of endocrine, nutritional, and metabolic disease deaths caused by obesity peaked in the midlife years, accounting in 2019 for 15 percent of those deaths among WNH people and 14 percent of such deaths among Black people in this age group.

Chart 27, Panel D shows that the all-ages obesity mortality rate in 2019 was highest for Black females (3.6), followed by Black males (3.4), WNH males (2.6), and WNH females (2.0). During the 1999–2019 period, all-ages obesity mortality rates rose by a factor of 1.8 among Black females, more than doubled for males in all RE groups and for WNH and Hispanic females, and tripled for API females. Obesity mortality rates rose for all RE/sex groups in the midlife ages and, especially, for the aged. For instance, the obesity death rate for WNH men aged 65 or older rose from 1.6 in 1999 to 6.2 in 2019, a factor of 3.9. At ages 25–64, men typically had higher obesity mortality rates than women in the same RE group. At older ages, however, the pattern generally reversed, with women experiencing higher death rates than men. Note also that in the midlife ages, Black men and women were the two RE/sex groups with the highest obesity mortality rates, while at ages 65 or older, WNH men and women had higher obesity mortality rates than Black men (but not Black women). Further, in the latter years of the observation period, the gender gap in obesity mortality narrowed in the Black population but widened among WNH and Hispanic people.

Malnutrition is a serious health issue, especially among the aged. Appetite tends to decline with age, and illness and certain medications can further diminish appetite. Aged individuals are also more likely to have poor dental health and more difficulty chewing and swallowing, which impairs their ability to eat. Other factors more prevalent among the aged, such as loneliness, failing health, and lack of mobility can lead to depression and poor or irregular eating habits. In addition, Alzheimer's disease, dementia, and other cognitive disorders affecting memory and behavior can result in forgetting to eat or even how to swallow. The percentage of endocrine, nutritional, and metabolic disease deaths that were associated with malnutrition increased over the observation period and peaked at the oldest ages. Typically, malnutrition accounts for a higher share of this category's deaths among females than males and among the WNH population than in the other RE groups. Over all ages combined, malnutrition caused 9.2 percent of endocrine, nutritional, and metabolic disease deaths among WNH individuals

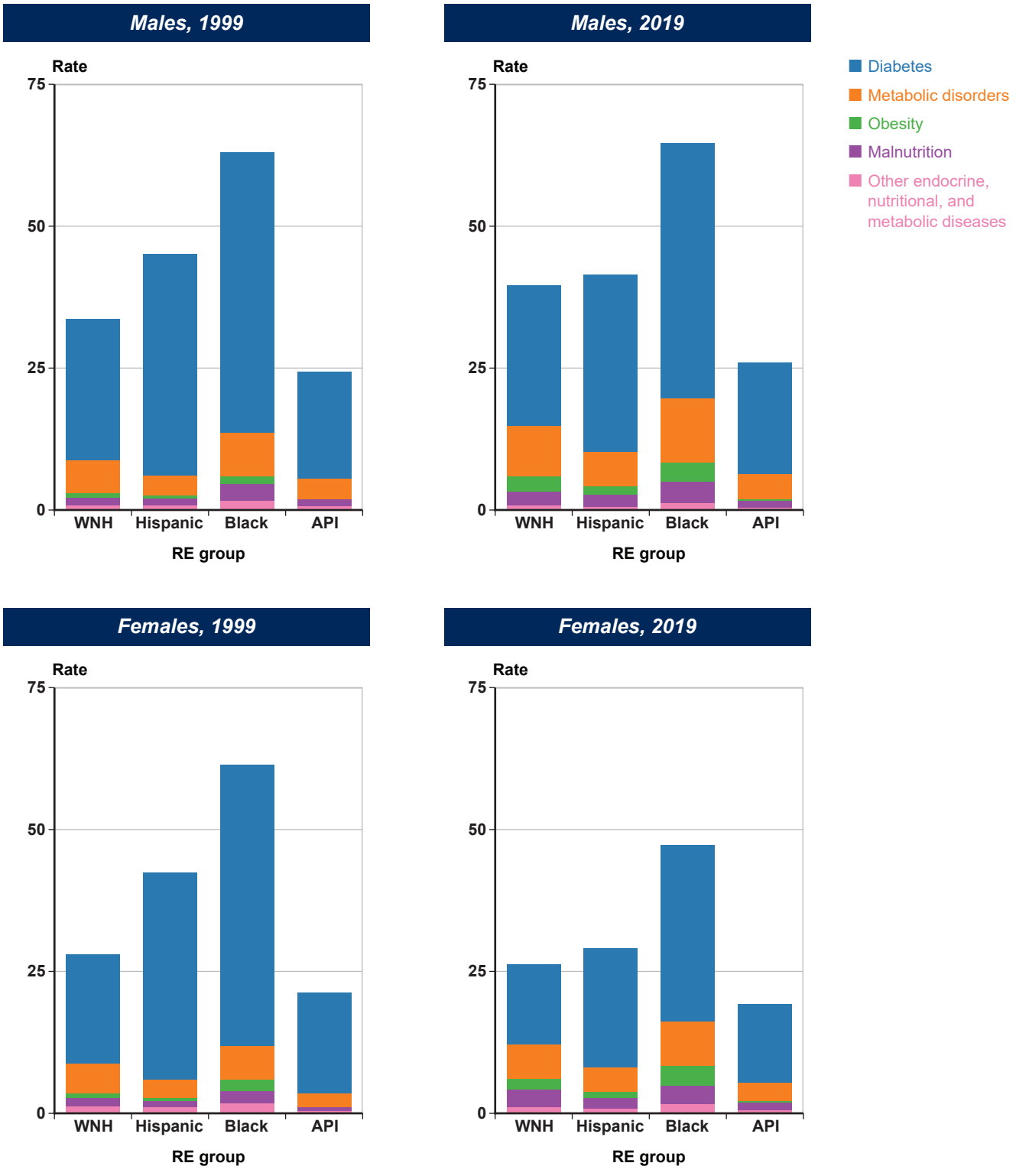
and 5–6 percent of such deaths among the other RE groups in 2019. For women aged 85 or older, malnutrition's share of such deaths in 2019 ranged from 11.8 percent in the API population to 22.7 percent among the WNH group.

Chart 27, Panel E shows that malnutrition mortality rates were highest among Black males, followed by Black females, WNH females, and WNH males. Mortality rates broadly declined from 1999 to 2010 but increased afterward, resulting in a higher all-ages death rate in 2019 than in 1999 among all RE/sex groups. From 2010 to 2019, the all-ages malnutrition death rate more than doubled for Black females, API males, and Hispanic males and females; it more than tripled among WNH males and females, Black males, and API females.

The residual subcategory "all other endocrine, nutritional, and metabolic diseases" includes disorders of the thyroid gland, other disorders of glucose regulation and pancreatic internal secretion, disorders of other endocrine glands, and other nutritional deficiencies. This subcategory's share of all endocrine, nutritional, and metabolic disease deaths ranged from 1.8 percent in the Hispanic population to 2.9 percent among WNH individuals. Chart 27, Panel F shows that from 1999 to 2019, the all-ages death rate for all other endocrine, nutritional, and metabolic diseases declined for every RE/sex group except API females. In 2019, Black females had the highest all-ages mortality rates in this subcategory, followed by Black males and WNH females. At ages 65 or older, however, mortality rates were higher for WNH women than for Black men.

Chart 28 shows the all-ages endocrine, nutritional, and metabolic disease mortality rates by cause-of-death subcategory, RE group, and sex in 1999 and 2019. In both years, the mortality rate associated with diabetes mellitus was higher in the Black population than the death rate from all endocrine, nutritional, and metabolic diseases combined for the other RE groups, regardless of sex. Likewise, the death rate from diabetes among Hispanic males and females in 1999 was higher than the mortality from all endocrine, nutritional, and metabolic diseases among the WNH and API communities that year. Over the observation period, the death rates associated with metabolic disorders, obesity, and malnutrition rose in all RE/sex groups, but the diabetes mortality rate declined in every group other than API males. As a result, the endocrine, nutritional, and metabolic disease mortality rate rose for WNH, Black, and API males, while it declined for Hispanic males and for females in all RE groups.

Chart 28.
Endocrine, nutritional, and metabolic diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Mental and Behavioral Disorders

Deaths caused by mental and behavioral disorders as a percentage of all deaths ranged in 2019 from 3.1 percent for Hispanic people to 5.1 percent among the WNH population. This section examines the four mental and behavioral disorder subcategories listed in Box 8.

Chart 29 shows the number and percentage distribution of mental and behavioral disorder deaths by subcategory for 1999 and 2019, with detail by RE group and age. Unspecified dementia was by far the primary cause of mental and behavioral disorder–related death at all ages, in 2019 constituting 60.6 percent of such deaths in the Hispanic population, 68.1 percent of those among Black people, 70.1 percent of those in the API community, and 74.3 percent of them among WNH individuals. The share of mental and behavioral disorder–related deaths caused by unspecified dementia increased over the observation period and was significantly higher at older ages than at younger ones and for women than for men. For instance, 76.2 percent of deaths caused by unspecified dementia among WNH men occurred at ages 65 or older, and for WNH women, that figure was 84.3 percent.

Chart 30 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for mental and behavioral disorders overall.

Chart 30, Panel B shows that in 1999, the all-ages unspecified dementia mortality rate was highest for WNH females, followed by WNH males, Black males, and Black females. The death rates rose sharply thereafter in all RE/sex groups until 2012 or 2013, then began to decline. Nevertheless, the all-ages mortality rate in 2019 was more than twice what it had been in 1999 among the WNH, Black, and API populations, regardless of sex. In 2019, WNH females had the

Box 8.
Mental and behavioral disorder cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Unspecified dementia	Unspecified dementia	F03
All other organic disorders	Other organic disorders	. . .
Vascular dementia	. . .	F01
Organic amnestic syndrome not induced by alcohol and other psychoactive substances	. . .	F04
Delirium not induced by alcohol and other psychoactive substances	. . .	F05
Other mental disorders caused by brain damage, dysfunction, and physical disease	. . .	F06
Personality and behavioral disorders caused by brain disease, damage, and dysfunction	. . .	F07
Unspecified organic or symptomatic mental disorders	. . .	F09
Mental and behavioral disorders caused by psychoactive substance use	Psychoactive substance use	F10–F19
All other mental and behavioral disorders	Other mental and behavioral disorders	. . .
Schizophrenia, schizotypal, delusional, and other nonmood psychotic disorders	. . .	F20–F29
Mood (affective) disorders	. . .	F30–F39
Anxiety, dissociative, stress-related, somatoform, and other nonpsychotic disorders	. . .	F40–F48
Behavioral syndromes associated with physiological disturbances and physical factors	. . .	F50–F59
Disorders of adult personality and behavior	. . .	F60–F69
Intellectual disability	. . .	F70–F79
Pervasive and specific developmental disorders	. . .	F80–F89
Behavioral and emotional disorders with onset usually occurring in childhood and adolescence	. . .	F90–F98
Unspecified mental disorders	. . .	F99

SOURCE: ICD-10.

NOTE: . . . = not applicable.

Chart 29.
Mental and behavioral disorders: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019

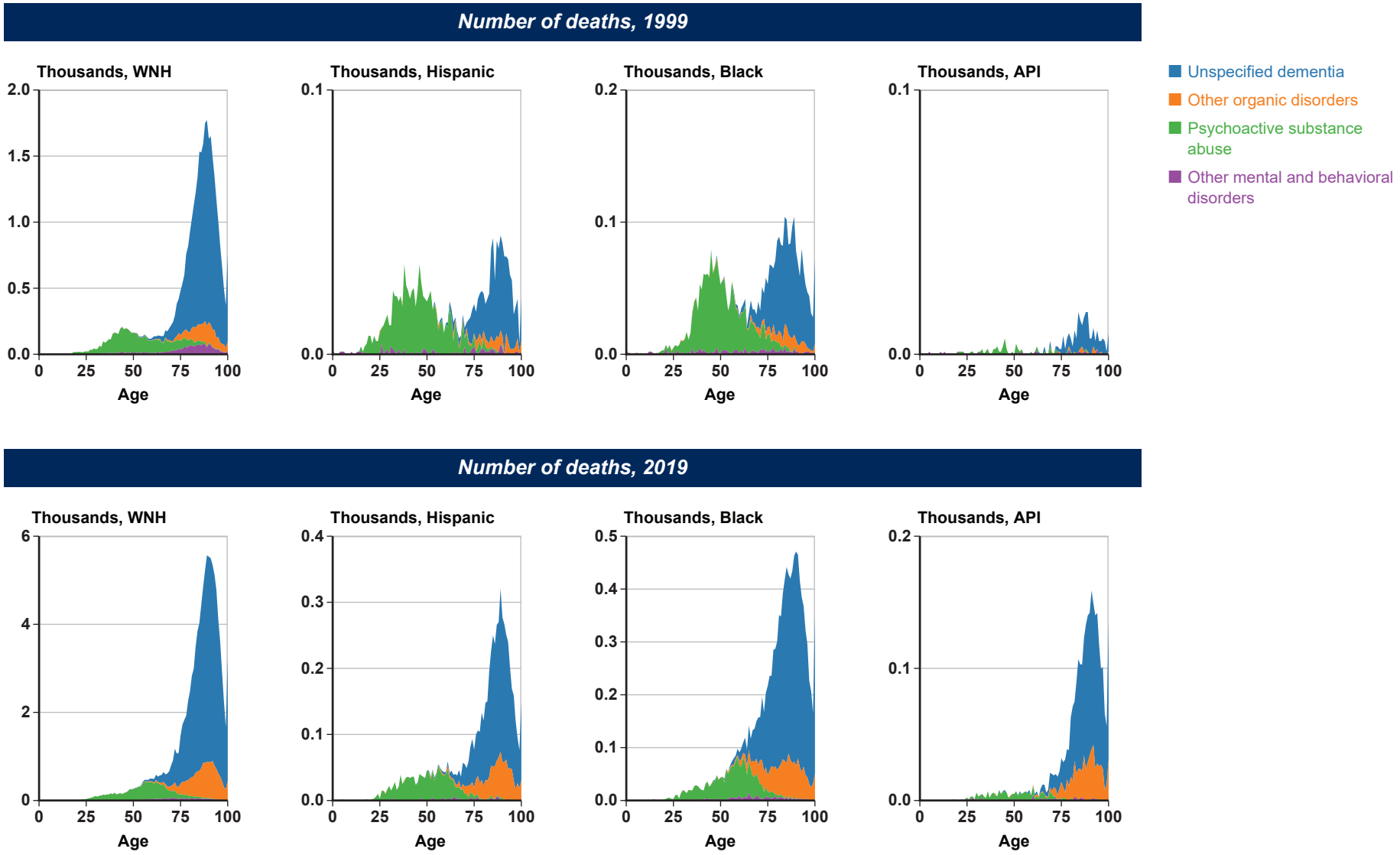


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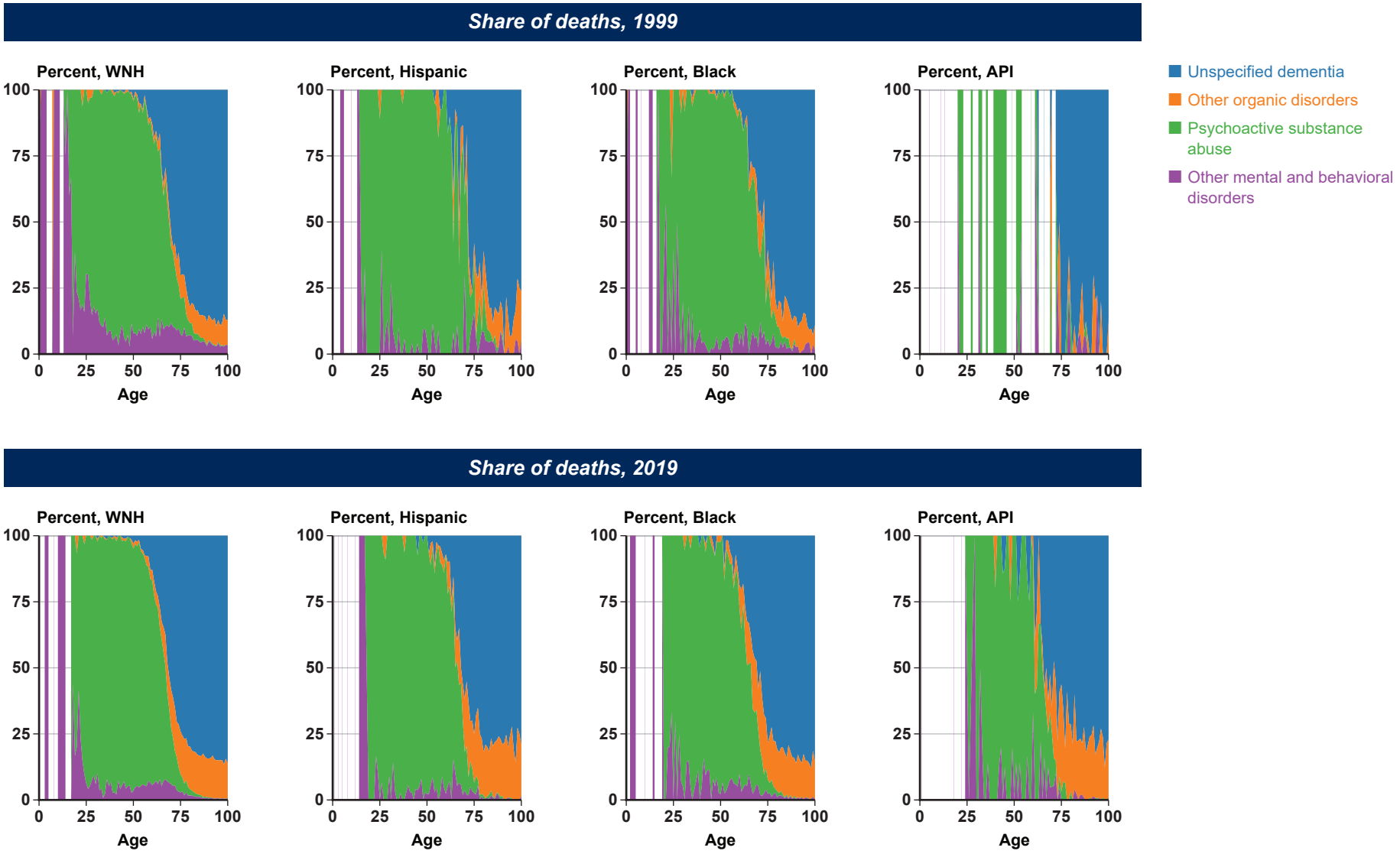
Chart 29.
Mental and behavioral disorders: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*

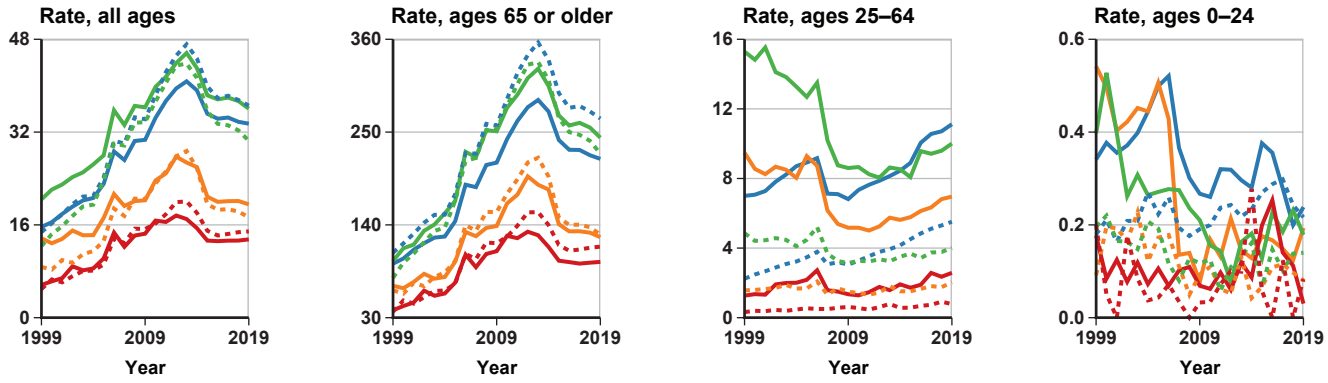


SOURCE: Author's calculations based on CDC WONDER.

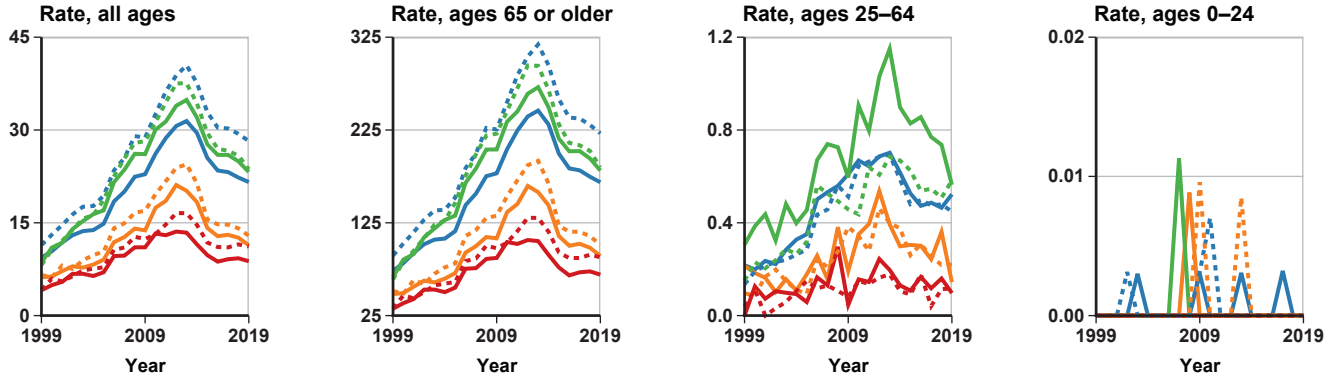
Chart 30.
Mental and behavioral disorders: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel A: All mental and behavioral disorders



Panel B: Unspecified dementia



Panel C: Other organic disorders

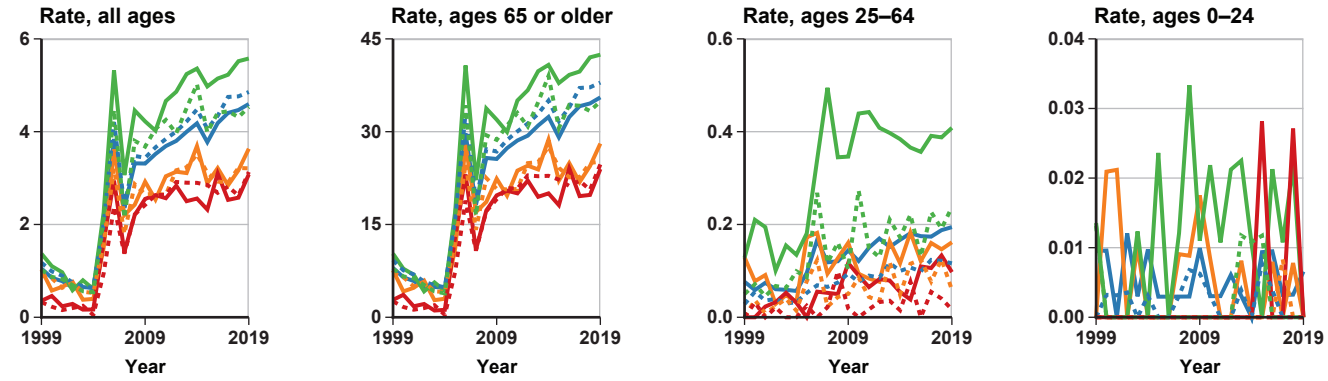


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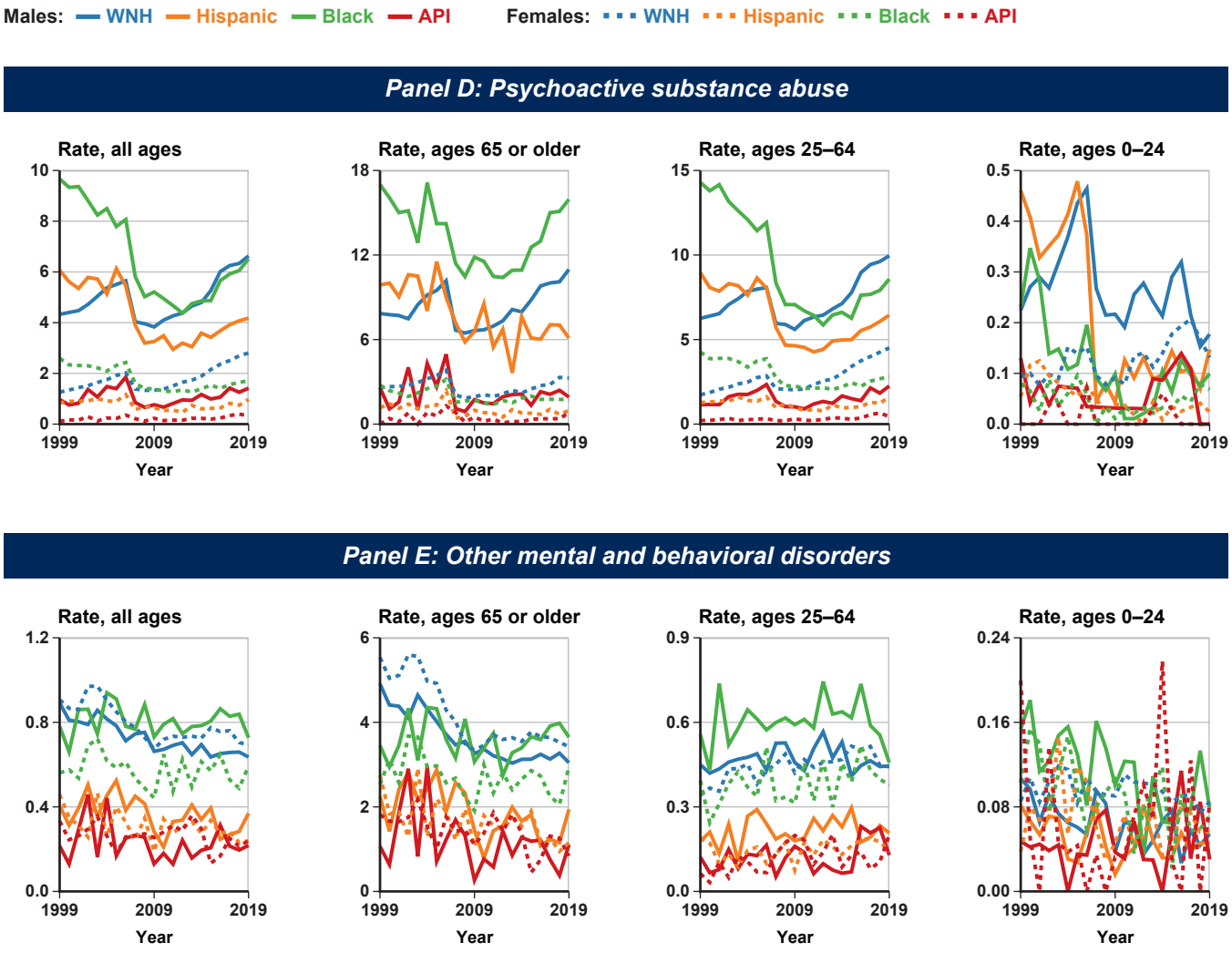
Chart 30.
Mental and behavioral disorders: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

highest all-ages unspecified dementia mortality rate (28.2), followed by Black females (23.7), Black males (23.2), and WNH males (21.6). API males and females had the lowest all-ages unspecified dementia death rates (8.8 and 11.2, respectively).

The subcategory labeled "all other organic disorders" includes delirium not induced by alcohol and other psychoactive substances; other mental disorders caused by brain damage, dysfunction, and physical disease; personality and behavioral disorders caused by brain disease, damage, and dysfunction; and unspecified organic or symptomatic mental disorders. However, 93 percent of the deaths in this subcategory in 2019 involved vascular dementia, which occurs when an inadequate blood supply damages the brain. The share of mental or behavioral disorder–related deaths caused by all other organic disorders increased over the observation period, peaking at older ages. It was the second leading cause of mental or behavioral disorder–related death in 2019 (after unspecified dementia) among females in all RE groups as well as for API males.

Chart 30, Panel C shows that all-ages other organic disorder mortality rates rose steeply after 2004. From 1999 to 2019, the rates more than tripled among Hispanic males and females, more than quadrupled for the WNH and Black populations of both sexes, and increased by factors of 7.8 and 10.3 among API males

and females, respectively. Black males had the highest all-ages other organic disorder mortality rate in 2019 (5.6), followed by WNH females, WNH males, and Black females.

The shares of all-ages mental and behavioral disorder deaths brought about by psychoactive substance use in 2019 were 6.8 percent among API people, 10.2 percent in the WNH community, 14.9 percent for Black individuals, and 20.6 percent in the Hispanic population. Among deaths attributed to psychoactive substance use, most (74.2 percent in 2019) were due to alcohol. Deaths from this cause are disproportionately higher among males than females. For instance, in 2019, psychoactive substance use accounted for 35.7 percent of all-ages mental and behavioral disorder–related deaths among Hispanic males, but only 7.5 percent of those among Hispanic females. Although psychoactive substance use typically accounts for lower percentages of mental and behavioral disorder–related deaths at older ages, it is the main cause of such deaths in the midlife years and even at younger ages. In 2019, psychoactive substance use caused 78.6 percent of mental and behavioral disorder–related deaths at ages 25–64 in the API and Black populations, 83.9 percent of those for WNH individuals, and 89.5 percent of those among Hispanic people.

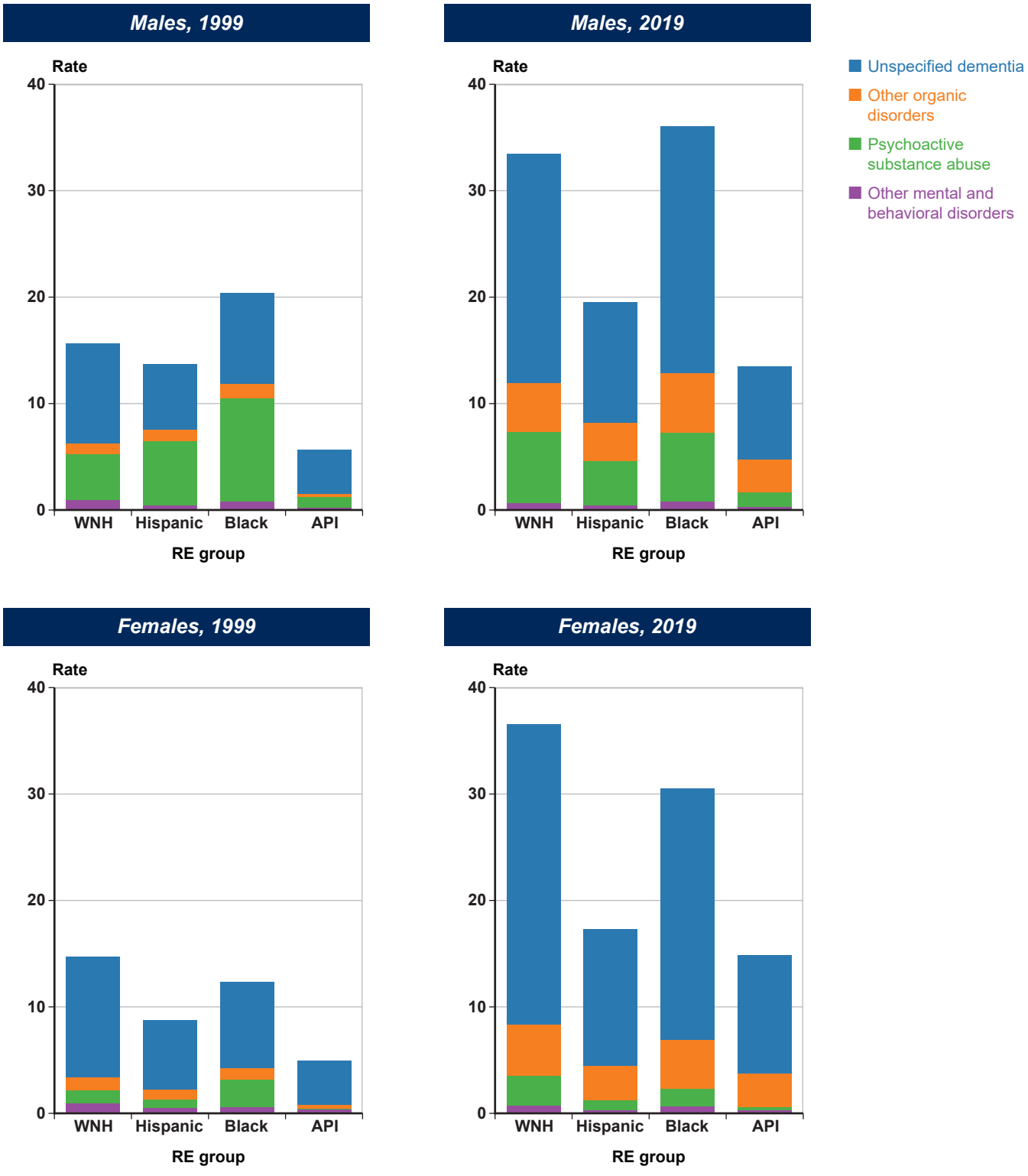
Chart 30, Panel D shows that in 1999, the all-ages death rates from psychoactive substance use for Black males and females were more than double those of their WNH counterparts. Hispanic males had a higher psychoactive substance use mortality rate than WNH males, but Hispanic females had a lower mortality rate than WNH females. By 2019, the WNH RE group had the highest all-ages mortality rate both for males (6.6) and females (2.8). The all-ages mortality rate from psychoactive substance use was higher in 2019 than in 1999 among WNH and API people of both sexes and for Hispanic females. Notice, however, that the all-ages death rate from psychoactive substance use rose in all RE/sex groups during the second half of the period (2010–2019), which appears consistent with the previously mentioned trend involving deaths of despair. Male-to-female substance use mortality ratios in 2019 were 2.4 in the WNH population, 3.8 among Black individuals, 4.2 in the Hispanic community, and 4.7 for API people.

The "all other mental and behavioral disorders" subcategory includes schizophrenia, schizotypal, delusional, and other nonmood psychotic disorders; mood (affective) disorders; anxiety, dissociative, stress-related, somatoform, and other nonpsychotic disorders; behavioral syndromes associated with physiological disturbances and physical factors; adult personality and behavior disorders; and intellectual disabilities. Depending on the RE group, this residual subcategory accounted for 1.7–2.2 percent of mental and behavioral disorder–related deaths at all ages. Chart 30, Panel E shows the age-adjusted mortality rates for this subcategory.

Chart 31 shows the all-ages mental and behavioral disorder mortality rates by cause-of-death subcategory, RE group, and sex in 1999 and 2019. Overall mental and behavioral disorder mortality rates increased substantially during the 21-year period, more than doubling for WNH and API males and females as well as for Black females. In 1999, males had higher all-ages death rates than females for mental and behavioral disorders overall, regardless of RE group. In 2019, however, WNH and API females experienced higher overall mental and behavioral disorder mortality rates than their male counterparts. For all RE/sex groups other than Hispanic males, the all-ages mortality rate in 2019 from unspecified dementia alone exceeded the 1999 mortality rate for all mental and behavioral disorders combined.

Black males had higher all-ages mental and behavioral disorder mortality rates than WNH males in both years, although for different reasons. In 1999, Black males had a slightly lower mortality rate than WNH males from the combination of unspecified dementia and all other organic disorders, but a higher mortality rate associated with psychoactive substance use. In 2019, the reverse was true, with Black males experiencing a slightly lower mortality rate from psychoactive substance use than WNH males, but a higher death rate from the combination of unspecified dementia and all other organic disorders. WNH females experienced a higher mortality rate from mental and behavioral disorders overall than their Black counterparts in both years. In 1999, WNH females had higher all-ages mortality rates than Black females from both unspecified dementia and all other organic disorders, but a lower mortality rate from psychoactive substance use. In 2019, WNH females had higher mortality rates than Black females overall and for each cause-of-death subcategory. Finally, note that from 1999 to 2019, the death rate associated with psychoactive substance use declined among Black males and females and Hispanic males but increased significantly for WNH males and females.

Chart 31.
Mental and behavioral disorders: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Diseases of the Digestive System

Across the RE groups, the percentages of all deaths that were caused by diseases of the digestive system in 2019 ranged from 3.0 percent in the Black population to 5.7 percent among Hispanic people. This section discusses the six digestive system disease subcategories listed in Box 9.

Chart 32 shows the count and the percentage distribution of digestive system disease–related deaths by cause-of-death subcategory for 1999 and 2019, with detail by RE group and age. Alcoholic liver disease was the primary cause of digestive system disease–related death among Hispanic males in 2019, accounting for 43.4 percent of those deaths, compared with 25.7 percent for WNH males and about 20 percent for Black and API males. Similarly, the share of digestive system disease deaths caused by other liver disease in 2019 was disproportionately high among Hispanic females, at 44.9 percent, compared with 30.3 percent for API females, 27.9 percent for WNH females, and 26.4 percent for Black females. Relative to other RE groups, the Hispanic population experienced higher incidence, more aggressive progression patterns, and poorer treatment outcomes for chronic liver diseases such as nonalcoholic fatty liver disease, alcoholic cirrhosis, and viral hepatitis B and C (Carrion and others 2011). Environmental risk factors and genetic differences are thought to play a role in these disparities.

The share of digestive system disease–related deaths that was caused by alcoholic liver disease increased from 1999 to 2019, was more prevalent among men than women, and was disproportionately high in the Hispanic community. At ages 25–64, it was the primary cause of digestive system disease–related death in 2019 for men in all RE groups and for WNH women.

Chart 33 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for digestive system diseases overall.

Chart 33, Panel B shows that Hispanic males had the highest all-ages alcoholic liver disease mortality rate in 2019, followed by WNH males, Black males, and WNH females. In 2019, the mortality rate for Hispanic males was 1.4 times higher than that of WNH males and 2.3 times that of Black males. The all-ages alcoholic liver disease mortality rate among WNH females in 2019 was 1.6 times higher than that of Hispanic females and 1.7 times that of Black females.

Box 9.
Digestive system disease cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Alcoholic liver disease	Alcoholic liver disease	K70
Other liver disease	Other liver disease	. . .
Toxic liver disease	. . .	K71
Hepatic failure, not elsewhere classified	. . .	K72
Chronic hepatitis, not elsewhere classified	. . .	K73
Fibrosis and cirrhosis of liver	. . .	K74
Other inflammatory liver diseases	. . .	K75
Other diseases of liver	. . .	K76
Liver disorders in diseases classified elsewhere	. . .	K77
Diseases of esophagus, stomach, and duodenum	Esophagus, stomach, and duodenum diseases	K20–K31
Other diseases of intestines	Other intestinal diseases	K55–K64
Disorders of gallbladder, biliary tract, and pancreas	Gallbladder, biliary tract, and pancreas disorders	K80–K87
All other diseases of the digestive system	Other digestive system diseases	. . .
Diseases of the oral cavity and salivary glands	. . .	K00–K14
Diseases of appendix	. . .	K35–K38
Hernia	. . .	K40–K46
Noninfective enteritis and colitis	. . .	K50–K52
Diseases of peritoneum	. . .	K65–K66
Other diseases of the digestive system	. . .	K90–K95

SOURCE: ICD-10.
NOTE: . . . = not applicable.

Chart 32.
Digestive system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019

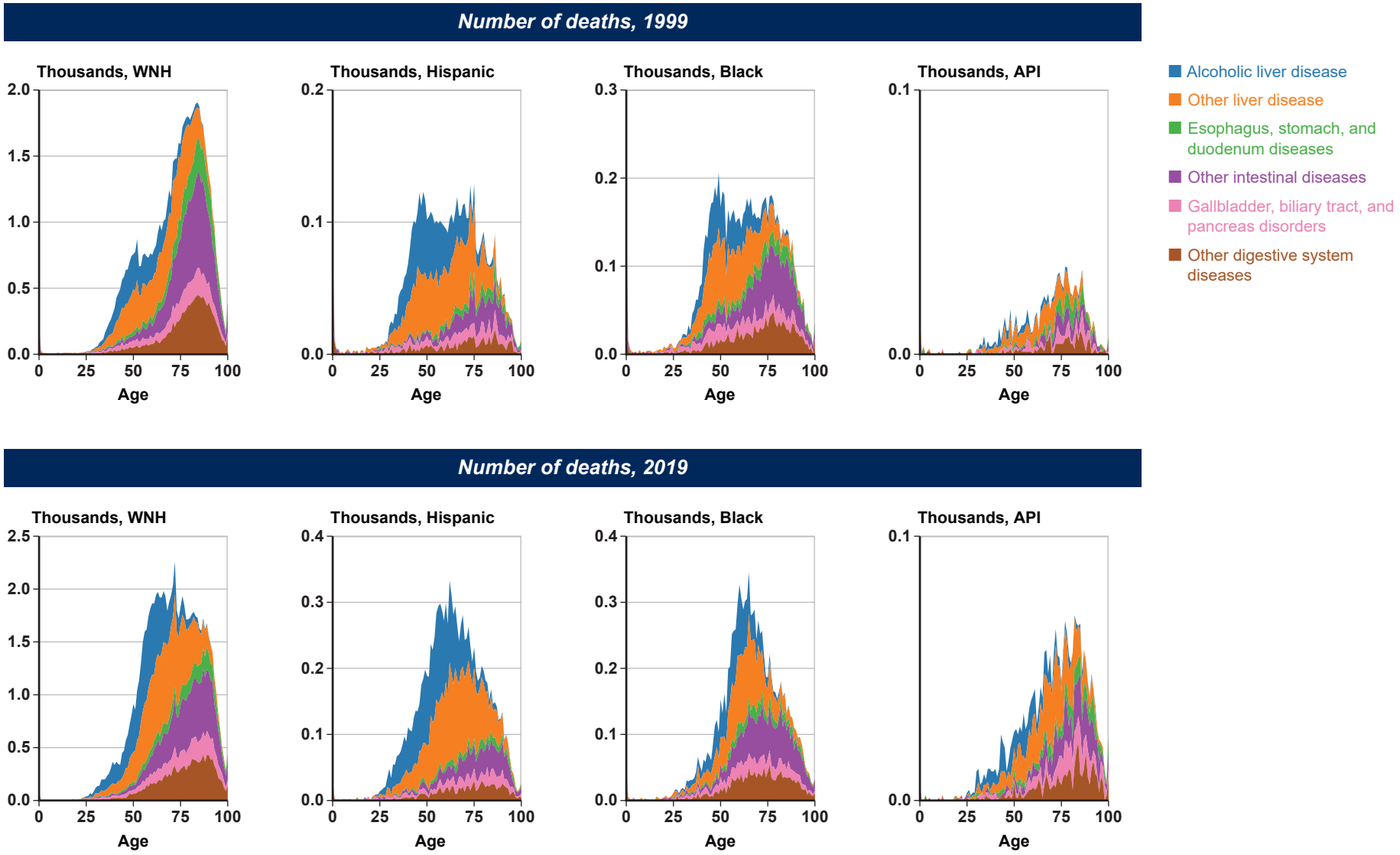


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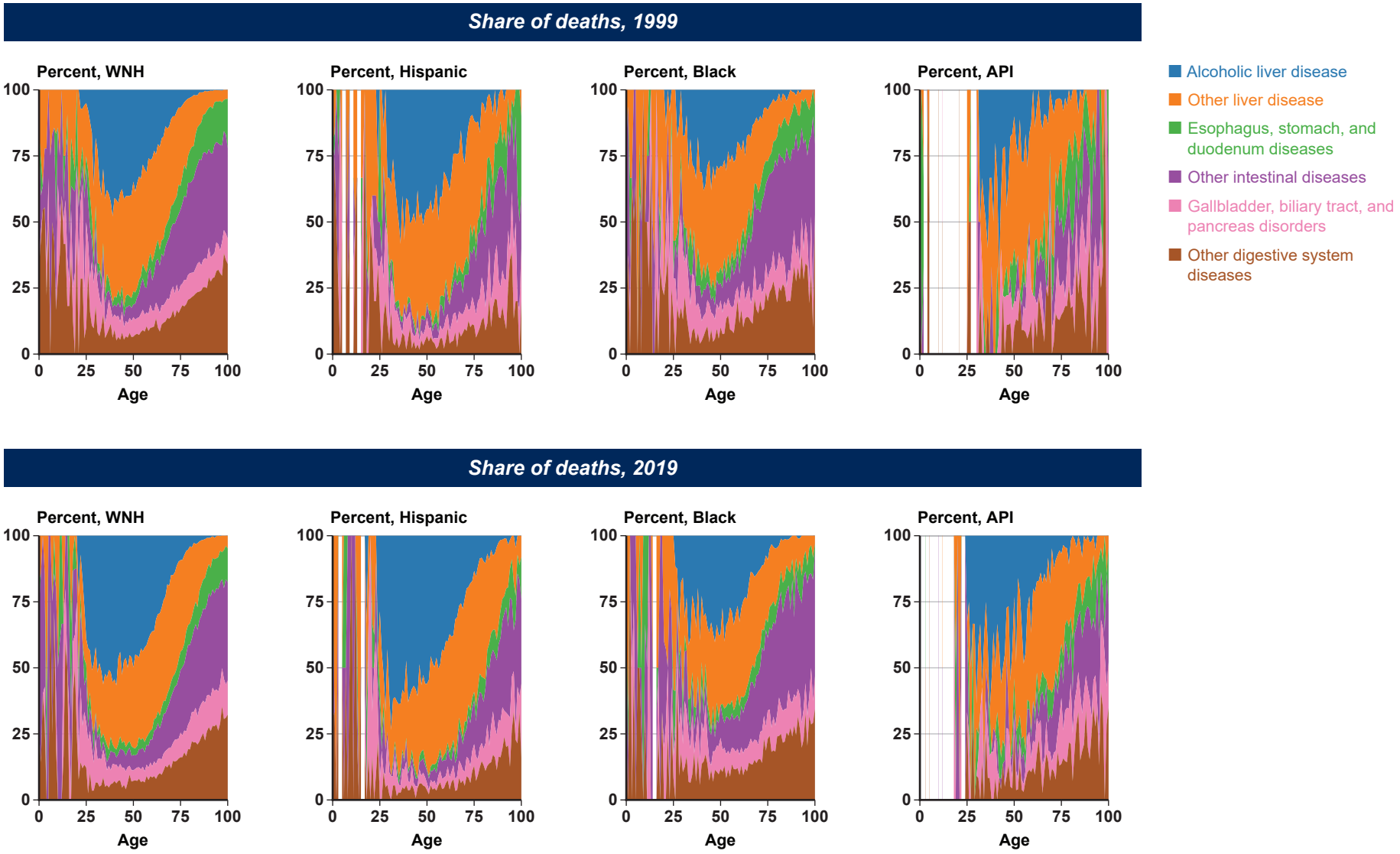
Chart 32.
Digestive system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*



SOURCE: Author's calculations based on CDC WONDER.

Chart 33.
Digestive system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

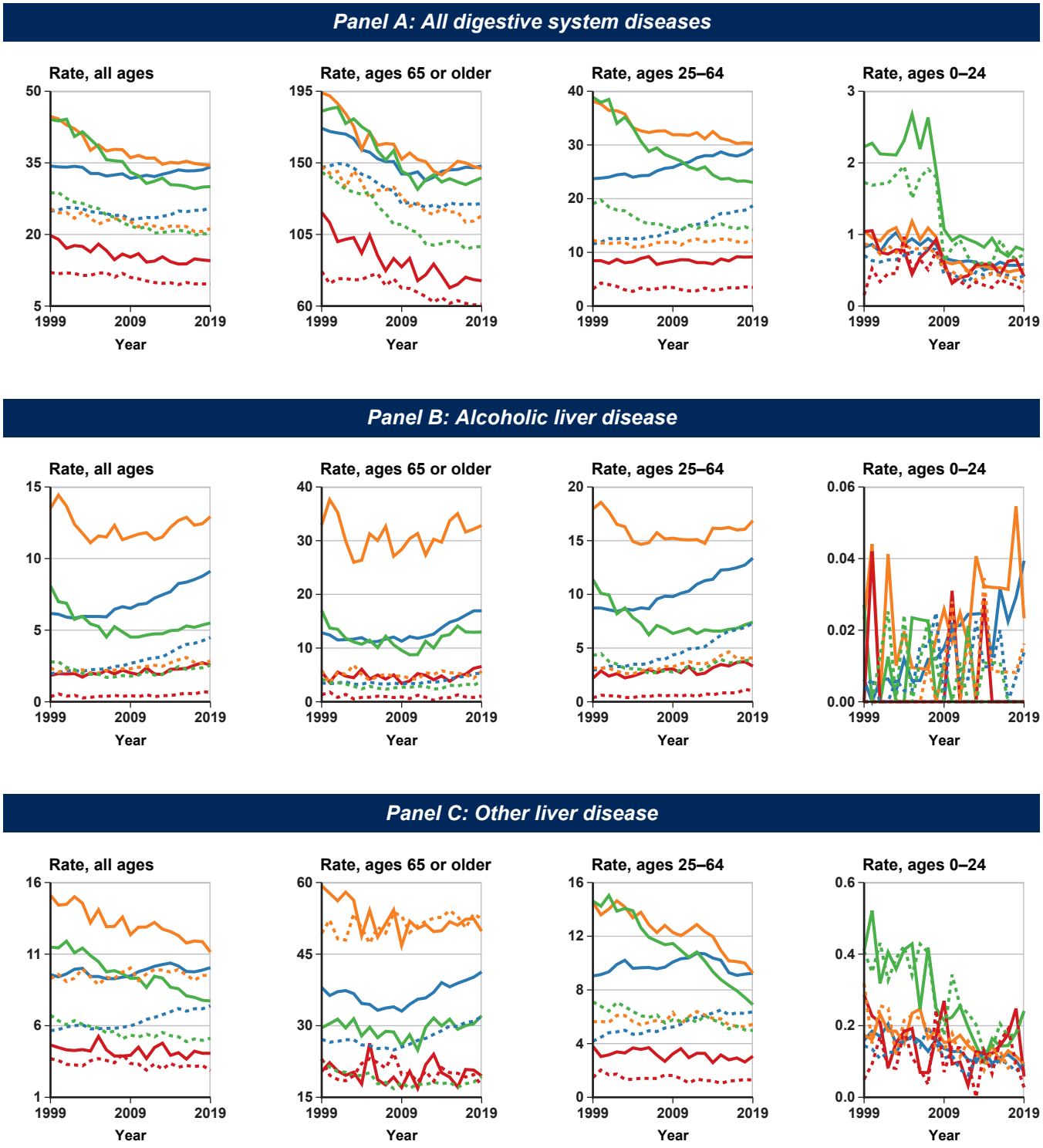


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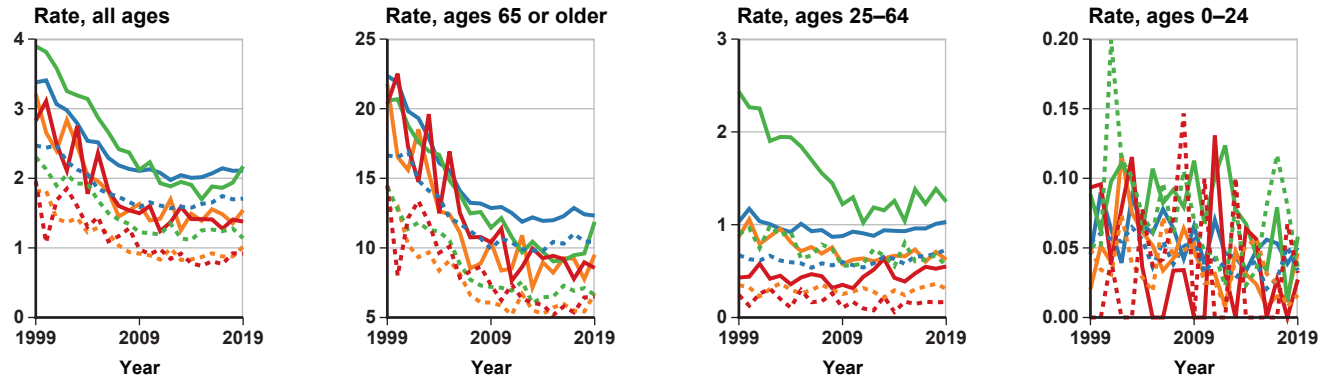
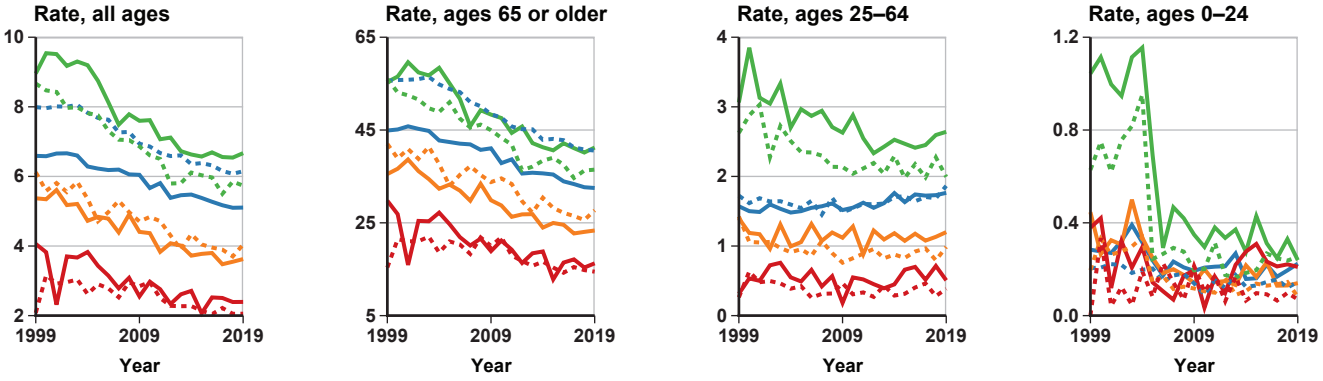
Chart 33.
Digestive system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel D: Esophagus, stomach, and duodenum diseases



Panel E: Other intestinal diseases



Panel F: Gallbladder, biliary tract, and pancreas disorders

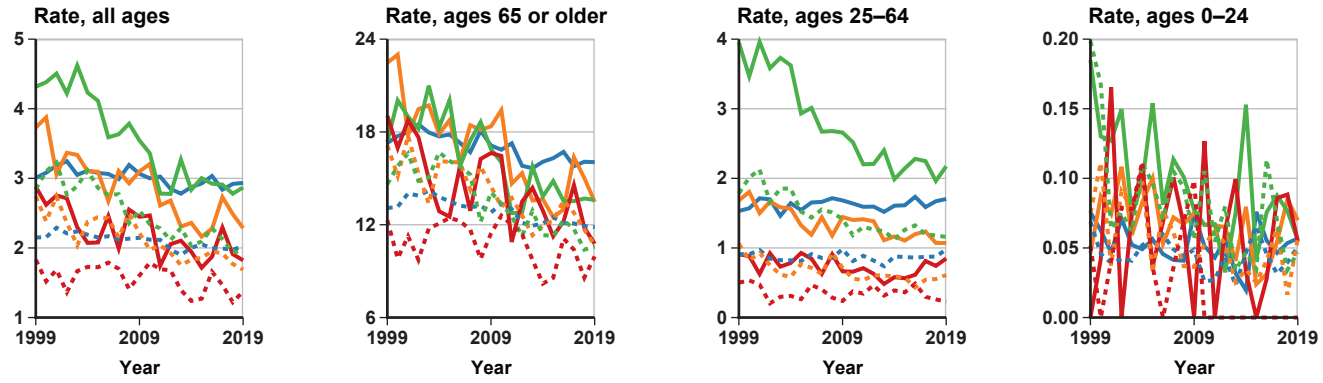


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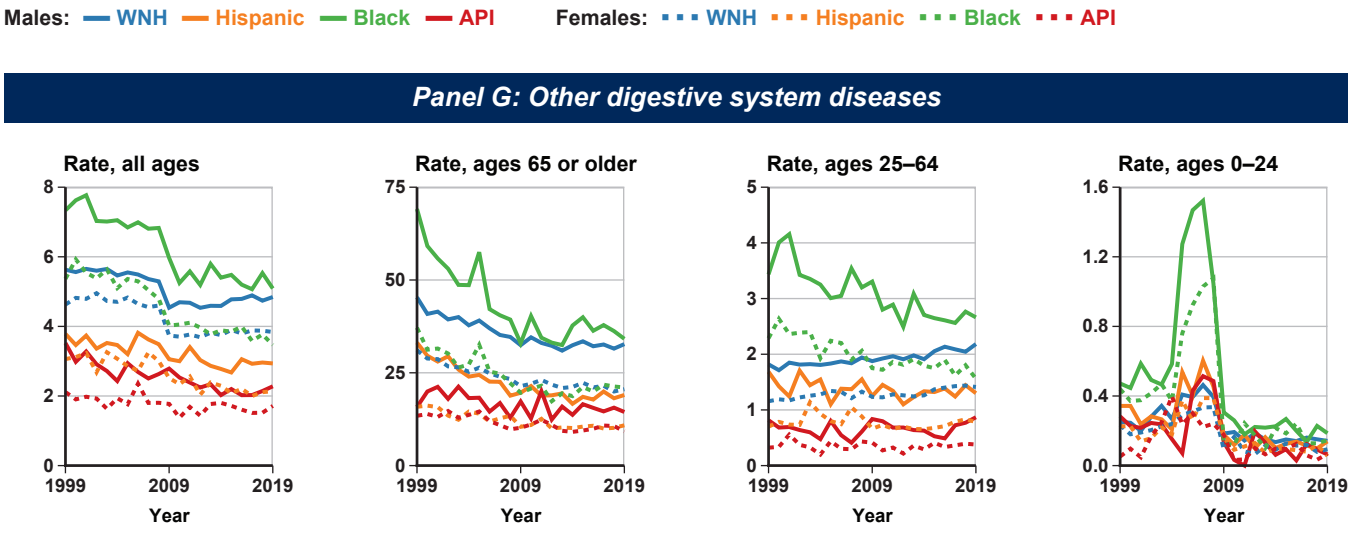
Chart 33.
Digestive system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Mortality rates were lower in 2019 than in 1999 for only three RE/sex groups: Hispanic males and Black males and females. During this period, the all-ages alcoholic liver disease death rate more than doubled for WNH females, from 2.0 to 4.5, and rose by 47.8 percent among WNH males. This trend exemplifies the rise in deaths of despair discussed earlier. Notably, alcoholic liver disease mortality rose for every RE/sex group in the second half of the period (2010–2019).

At all ages, other (nonalcohol-related) liver disease was the primary cause of digestive system disease–related deaths among WNH, Black, and API males and Hispanic, WNH, and API females. The share of digestive system disease–related deaths that was caused by nonalcoholic liver disease was disproportionately high for Hispanic females (44.9 percent).

Chart 33, Panel C shows that in 2019, Hispanic males had the highest all-ages nonalcohol-related liver disease mortality rate (11.1), followed by WNH males (10.0), Hispanic females (9.5), Black males (7.7), and WNH females (7.4). The mortality rates among Hispanic males and females were respectively 1.4 and 1.9 times greater than those of their Black counterparts. At ages 65 or older, Hispanic women had the highest nonalcohol-related liver disease death rate in 2019 (52.4), which corresponds with their disproportionately high share of digestive system disease deaths from this cause. Over the 1999–2019 period, all-ages nonalcohol-related liver disease mortality rates declined for most RE/sex groups. The exceptions were Hispanic females and WNH males, whose mortality rates rose slightly (by 2.3 percent and 5.1 percent, respectively), and WNH females, whose death rate rose by 30.7 percent, from 5.7 to 7.4.

The proportion of digestive system disease–related deaths that were caused by diseases of the esophagus, stomach, and duodenum ranged in 2019 from 4.0 percent in the Hispanic population to 9.1 percent among API people. The share declined from 1999 to 2019 and peaked at older ages, reaching, for instance, 14.1 percent of digestive system disease–related deaths among API individuals aged 85 or older.

Chart 33, Panel D shows that in 2019, Black males were the RE/sex group with the highest all-ages esophagus/stomach/duodenum disease mortality rate (2.2), followed by WNH males (2.1) and WNH females (1.7). However, WNH males had the highest all-ages esophagus/stomach/duodenum disease mortality rate from 2011 through 2018. At ages 25–64, esophagus/stomach/duodenum disease mortality rates were higher for Black men than for WNH men; but at older ages, the opposite was true. Black females had significantly lower esophagus/stomach/duodenum disease mortality rates than WNH females over the entire 1999–2019 period, both at ages 65 or older and over all ages combined. Over the 1999–2019 period, all-ages esophagus/stomach/duodenum disease mortality rates declined for all RE/sex groups. For Hispanic and API

males, as well as Black and API females, the all-ages death rate dropped by more than half over the period.

Of the digestive system diseases, the subcategory labeled "other diseases of intestines" became the primary cause of death among Black females in 2019, when it accounted for 28.1 percent of those deaths. Within the subcategory, about 66 percent of deaths involved vascular disorders of the intestines (inadequate blood supply), intestinal obstructions, and paralytic ileus (lack of muscle contractions). This subcategory accounts for a greater share of digestive system disease–related mortality for females than for males regardless of RE group. Other intestinal disorders account for a greater proportion of digestive system–related deaths in the Black and WNH populations than in the other RE groups. This subcategory also accounts for the greatest share of digestive system disease mortality at ages 85 or older in all RE groups.

Chart 33, Panel E shows that in 2019, Black males had the highest all-ages mortality rate from other intestinal diseases (6.7), followed by WNH females (6.1), Black females (5.7), and WNH males (5.1). Other intestinal disease death rates at ages 25–64 were higher for Black individuals than WNH people regardless of sex. However, at ages 65 or older, WNH women and Black men had similar death rates, while Black women had a higher mortality rate than WNH men. From 1999 to 2019, all-ages mortality from other intestinal diseases declined in all RE/sex groups.

At all ages, the shares of digestive system disease–related deaths that were attributed to disorders of the gallbladder, biliary tract, and pancreas ranged in 2019 from 6.4 percent for Hispanic people to 13.0 percent among the API population, with the gallbladder/biliary tract/pancreas disorder share of digestive system disease–related deaths typically highest at the oldest ages.

Chart 33, Panel F shows that Black males had the highest all-ages gallbladder/biliary tract/pancreas disorder death rate from 1999 until about 2011, when the mortality rates of WNH and Black males began to converge, such that by 2019, both were 2.9. A similar pattern appears in the all-ages gallbladder/biliary tract/pancreas disorder mortality rates of WNH and Black females. Mortality rates declined during the period in all RE/sex groups, especially among non-WNH groups.

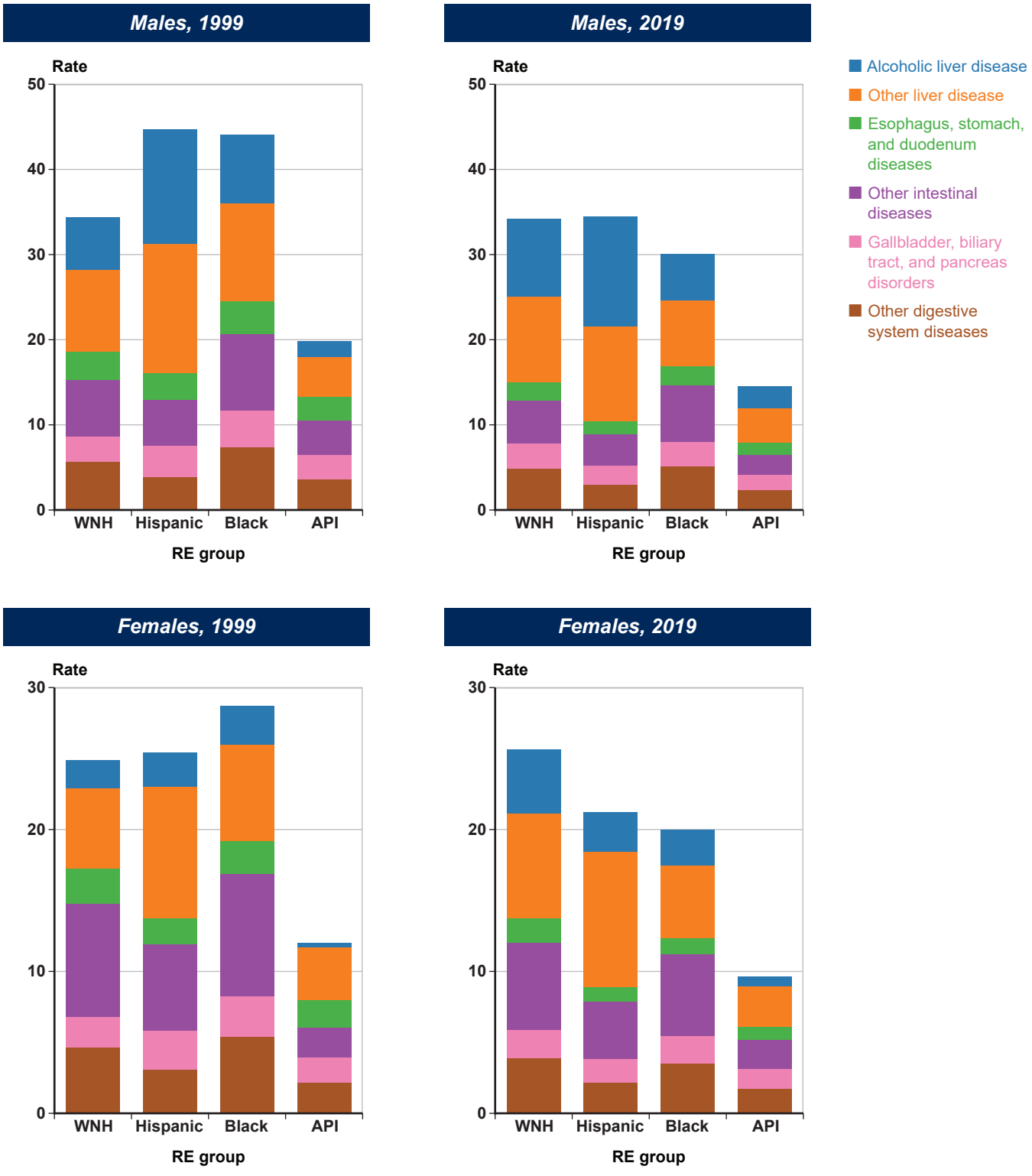
The residual subcategory "all other diseases of the digestive system" includes diseases of the oral cavity and the salivary glands; diseases of the appendix; hernias; noninfective enteritis and colitis; and diseases of the peritoneum. The share of digestive system–related deaths that was attributed to this group of disorders ranged in 2019 from about 8 percent among Hispanic individuals to about 16 percent for API and Black people. At ages 85 or older, other digestive system diseases constituted about one-quarter of digestive system disease–related deaths among the API, WNH, and Black populations.

Chart 33, Panel G shows that in 2019, Black and WNH males had the highest all-ages other-digestive-disease death rates (5.1 and 4.8, respectively), followed by WNH females (3.8) and Black females (3.5). The all-ages other-digestive-disease death rates declined for all RE/sex groups during the 1999–2019 period.

In summary, mortality caused by diseases of the digestive system shows a great deal of heterogeneity by RE/sex group, most notably with the Hispanic population exhibiting disproportionately high liver-disease mortality. Chart 34 shows the all-ages digestive disease mortality rates by cause-of-death subcategory, RE group, and sex in 1999 and 2019. In 1999, the death rate for Hispanic males (44.7) was slightly higher than that of Black males (44.1). However, the mortality-cause composition was quite different between the two populations, as Black males had substantially lower mortality from both alcoholic and other liver disorders, but higher mortality from all other subcategories, particularly other intestinal diseases and all other digestive system diseases. WNH males had significantly lower digestive system disease mortality rates than Black and Hispanic males in 1999, and alcoholic and other liver disease mortality among Hispanic males exceeded the mortality rate from all digestive system–related causes for API men. By 2019, the death rate from diseases of the digestive system had barely budged among WNH males, as increases in alcoholic and other liver disease mortality were offset by declines in other causes. By contrast, mortality rates decreased for males in the other RE groups, resulting in similar overall digestive-disorder mortality rates in 2019 between those who are WNH (34.2) and Hispanic (34.5) and a lower mortality rate for Black males (30.0).

Among females, the mortality rate from diseases of the digestive system in 1999 was highest among the Black RE group (28.7), followed by the Hispanic and WNH groups (25.4 and 24.9, respectively). By 2019, the digestive system disease death rate was highest in the WNH RE group, driven largely by a substantial increase in the mortality associated with diseases of the liver, while Black females had lower mortality rates than Hispanic females.

Chart 34.
Digestive system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Diseases of the Genitourinary System

Across RE groups, mortality caused by diseases of the genitourinary system ranged in 2019 from 2.4 percent of all deaths among WNH people to 3.5 percent of those among Black people. This section examines the three genitourinary system disease subcategories listed in Box 10.

Chart 35 shows the number and percentage distribution of genitourinary system disease deaths by subcategory for 1999 and 2019, with detail by RE group and age. Renal failure is the most common of these causes of death, ranging in 2019 from 66.2 percent of all genitourinary system–related deaths among WNH individuals to 78.3 percent of such deaths in the Black population. The share of genitourinary system–related deaths caused by renal failure increased slightly over the observation period and was lower for the WNH populations than in the other RE groups, regardless of sex. For instance, in 2019, renal failure accounted for 79.5 percent and 77.2 percent of all-ages genitourinary system–related deaths among Black males and females, respectively, but for only 70.0 percent of those deaths among WNH males and 62.5 percent of those among WNH females. The percentage of genitourinary system–related deaths caused by renal failure rises with age until about midlife then declines at older ages.

Chart 36 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for genitourinary system diseases overall.

Chart 36, Panel B shows that renal failure mortality rates among adults are higher for men than women. Black people have substantially higher mortality rates than the other RE groups, regardless of sex. For instance, in 2019, the all-ages renal failure death rate for Black males (28.8) was more than twice that of WNH males (13.6). Likewise, the all-ages mortality rate for Black females more than doubled that of their WNH counterparts (20.6 versus 9.3). For most of the 1999–2019 period, Hispanic males had slightly lower all-ages renal failure mortality rates than WNH males. All-ages renal failure mortality rates in 2019 were similar for API males and Hispanic and WNH females (all lower than 10), while API females were the RE/sex group with the lowest death rate (6.8). From 1999 to 2019, all-ages renal failure mortality rates declined for most RE/sex groups, particularly in the Black and API populations. In the midlife ages, however, renal failure mortality rates rose 43 percent among WNH men, from 2.8 to 4.0, and by 29 percent for WNH women, from 2.1 to 2.7.

The subcategory labeled "other disorders of the urinary system" consists primarily of urinary tract infections of an unspecified site. The share of genitourinary system–related deaths associated with this cause increased at older ages and declined significantly over the observation period. In 2019, the shares of all-ages genitourinary system–related deaths that were caused by other urinary system disorders ranged from 10.3 percent for the Black population to 18.8 percent for the WNH group. The percentage was higher for WNH people than for the other RE groups and was higher among females than males in all RE groups. For instance, in 2019, this subcategory accounted for 14.4 percent of genitourinary system–related deaths at all ages for WNH males, but for 23.1 percent of such deaths among WNH females.

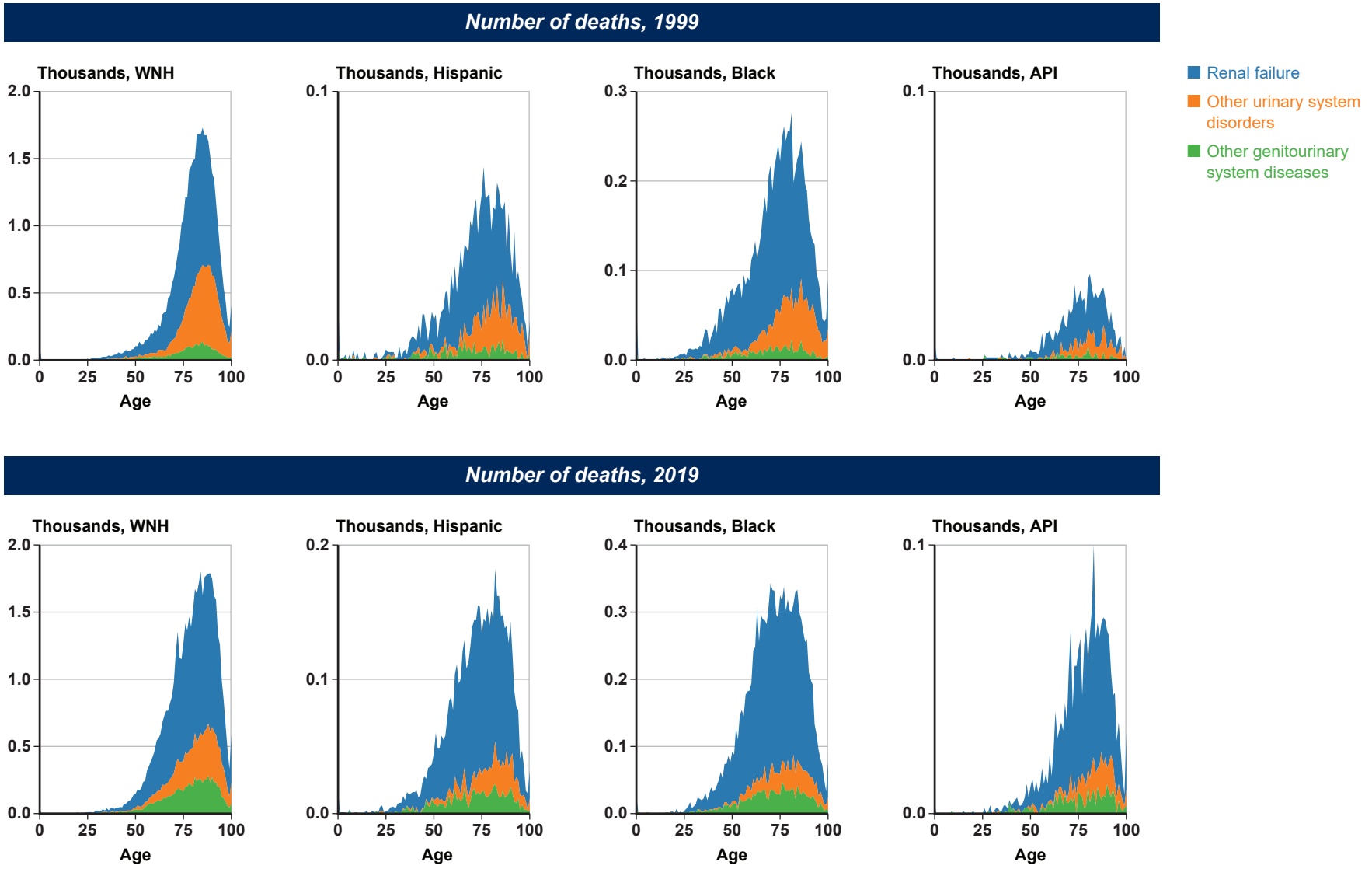
Box 10.
Genitourinary system disease cause-of-death subcategories

Formal title	Brief title	ICD code(s)
Renal failure	Renal failure	N17–N19
Other disorders of the urinary system	Other urinary system disorders	N30–N39
All other diseases of the genitourinary system	Other genitourinary system diseases	. . .
Glomerular diseases	. . .	N00–N07
Renal tubulo-interstitial diseases	. . .	N10–N15
Urolithiasis	. . .	N20–N23
Other disorders of the kidney and ureter	. . .	N25–N28
Diseases of male genital organs	. . .	N40–N50
Disorders of the breast	. . .	N60–N64
Inflammatory diseases of the female pelvic organs	. . .	N70–N76
Noninflammatory disorders of the female genital tract	. . .	N80–N98

SOURCE: ICD-10.

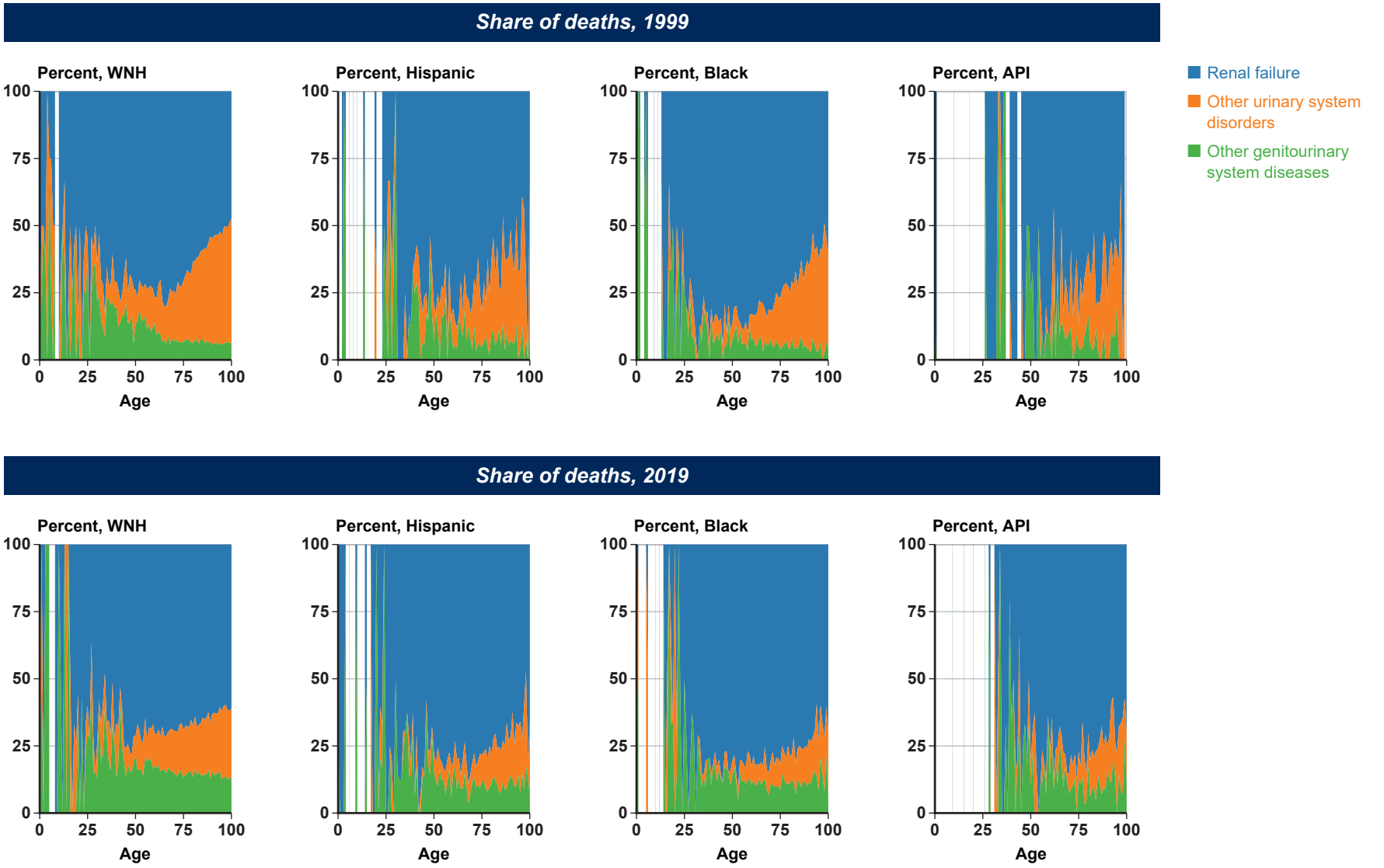
NOTE: . . . = not applicable.

Chart 35.
Genitourinary system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019



(Continued)

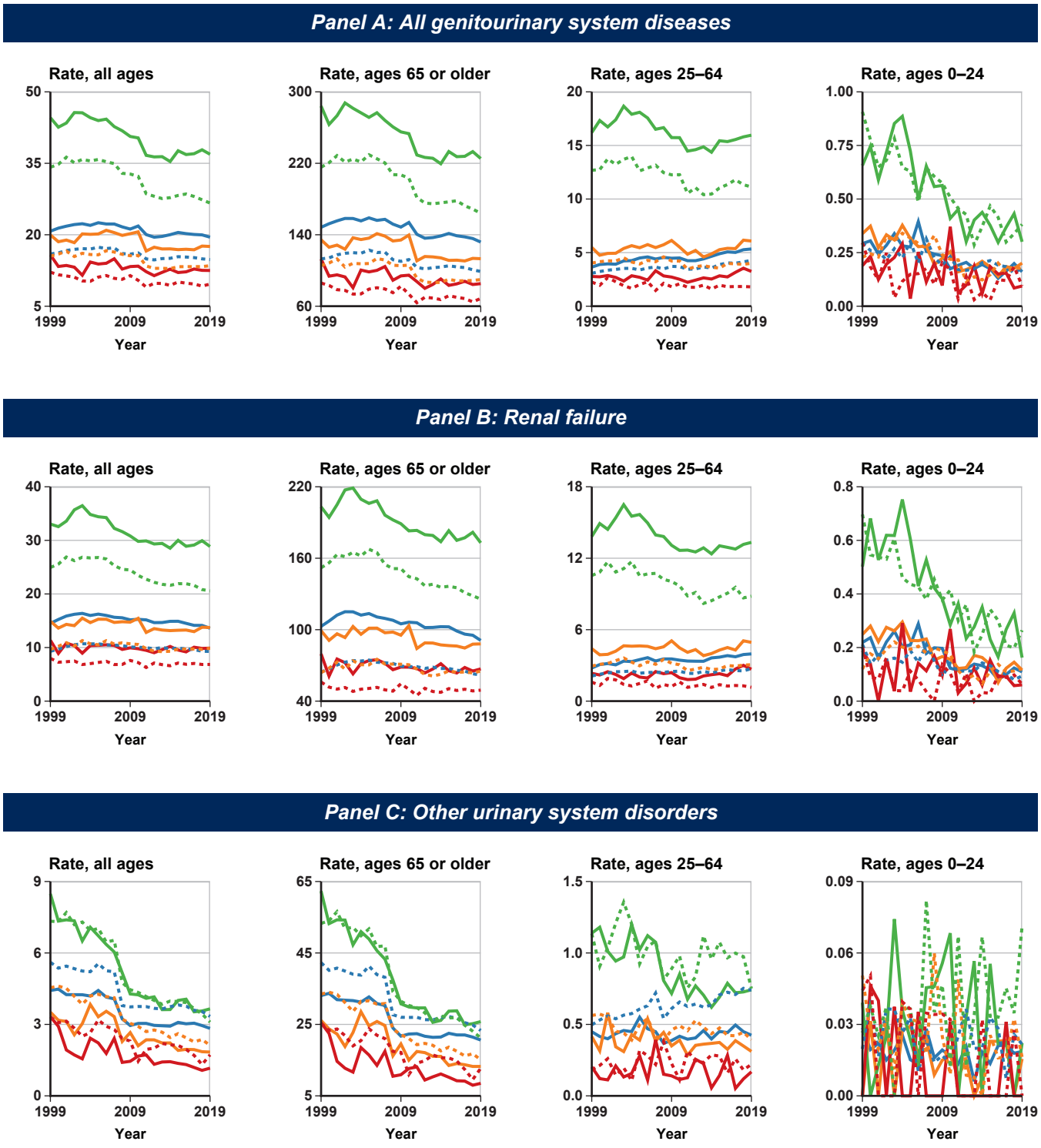
Chart 35.
Genitourinary system diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*



SOURCE: Author's calculations based on CDC WONDER.

Chart 36.
Genitourinary system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

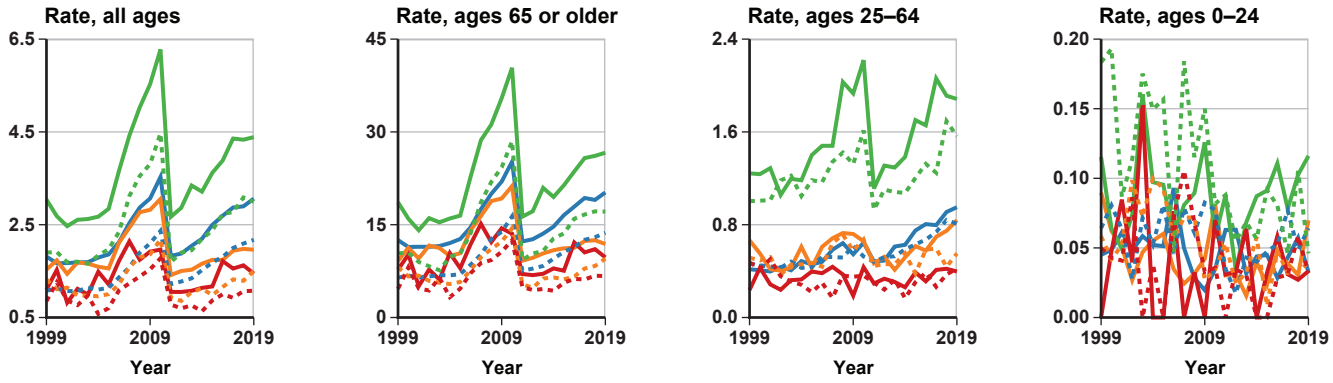


(Continued)

Chart 36.
Genitourinary system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel D: Other genitourinary system diseases



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

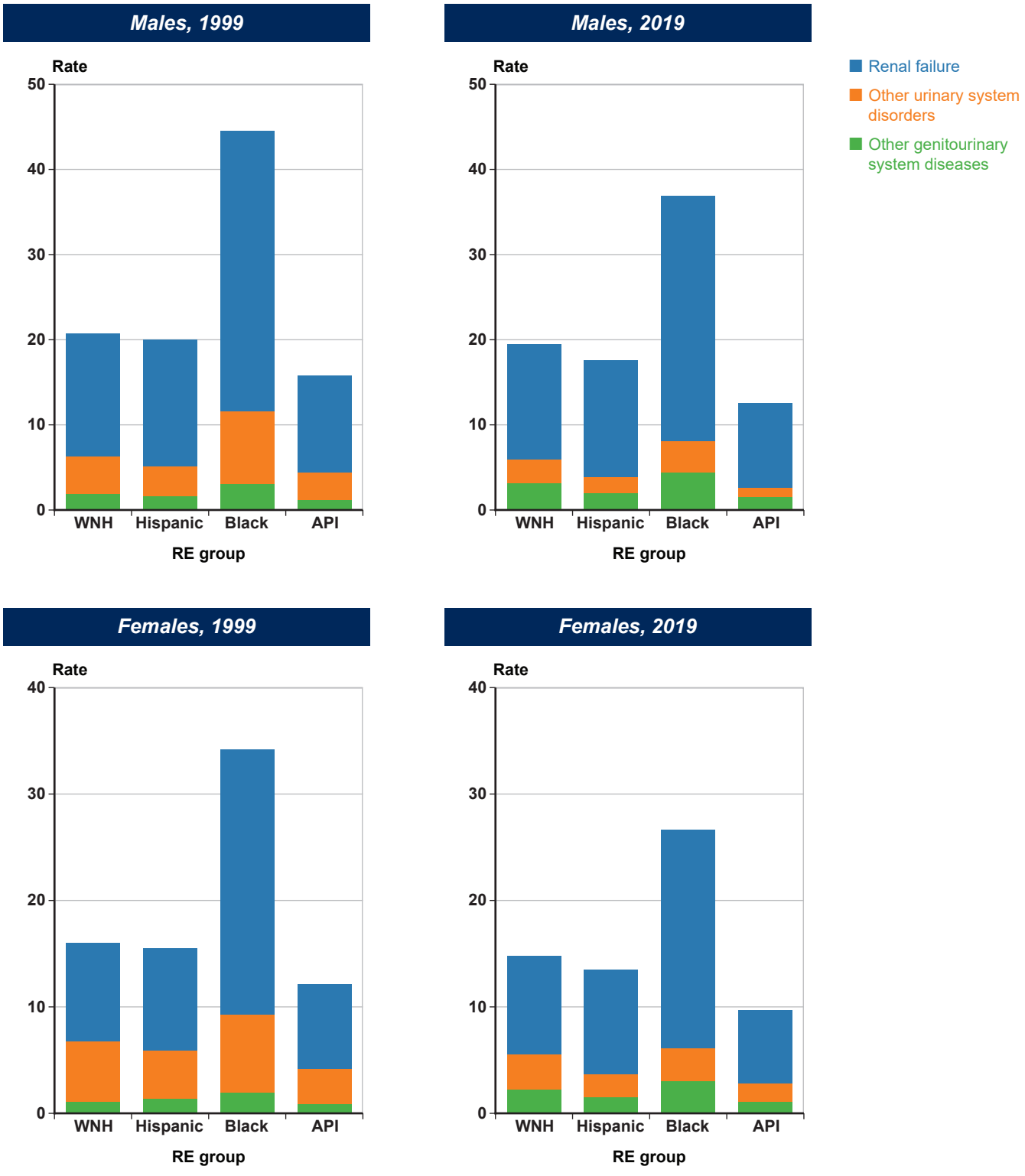
Chart 36, Panel C shows that Black males and Black females had the two highest all-ages other urinary system disorder mortality rates for most of the observation period (not always in that order). WNH females had the third highest rate from 1999 to 2012 and the second highest rate in 5 of the 7 years from 2013 to 2019. Females generally had higher mortality rates from other urinary system disorders than men in the WNH, Hispanic, and API populations, while the rates for Black males and females were similar. Hispanic males and females had lower other urinary system disorder mortality rates than their WNH counterparts at older ages and all ages combined, and API people had the lowest mortality rates from this cause. Over the 1999–2019 period, all-ages other urinary system disorder mortality rates declined in every RE/sex group, especially among the non-WNH groups. For instance, the all-ages other urinary system disorder death rate dropped by more than half among Black males (from 8.5 to 3.7) and Black females (from 7.3 to 3.1).

The third subcategory of genitourinary system–related deaths encompasses all other diseases of the genitourinary system. It includes glomerular diseases (which accounted for an unusually large spike in deaths from 2006 to 2010, peaking at 6,058 total deaths in 2010), renal tubulo-interstitial diseases, urolithiasis, and other disorders of the kidney and ureter. After 2010, deaths caused by other disorders of the kidney and ureter rose sharply, such that in 2019 they represented more than half of all deaths in this subcategory. The shares of genitourinary system–related deaths caused by all other diseases of the genitourinary system ranged in 2019 from 11.4 percent among the Hispanic, Black, and API communities to 15.0 percent for WNH individuals.

Chart 36, Panel D shows that the all-ages death rates from causes attributed to all other genitourinary system diseases peaked in 2010, driven by the spike in deaths from glomerular diseases mentioned above. From 2011 to 2019, mortality rates for this subcategory rose significantly among all RE/sex groups in the midlife and older age groups, driven by increasing mortality from other disorders of the kidney and ureter. Black males and females had the highest all-ages mortality rates in 2019, followed by WNH males and females.

Chart 37 presents the all-ages genitourinary system disease mortality rates by subcategory for 1999 and 2019, with detail by RE group and sex. In both years, the mortality rates associated with renal failure among Black males and females exceeded the death rates from all diseases of the genitourinary system combined for people of the same sex in the other RE groups. From 1999 to 2019, all-ages mortality rates declined for all RE/sex groups, modestly in the WNH population and substantially for the other groups. Mortality caused by renal failure and by other disorders of the urinary system (primarily urinary tract infections of unspecified site) declined, while mortality caused by all other diseases of the genitourinary system rose.

Chart 37.
Genitourinary system diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

Infectious and Parasitic Diseases

In 2019, the shares of all deaths that were attributed to the category "certain infectious and parasitic diseases" ranged from 2.1 percent for the WNH community to 3.3 percent among Black individuals. The category consists of the six infectious and parasitic disease subcategories listed in Box 11.

Chart 38 shows the number and percentage distribution of infectious and parasitic disease–related deaths by cause-of-death subcategory for 1999 and 2019, with detail by RE group and age. In 1999, HIV constituted only 8.7 percent of all infectious and parasitic disease–related deaths among API people and 12.5 percent of such deaths in the WNH community, but 43.2 percent of those in the Hispanic population and 49.1 percent among Black people. The HIV share of infectious and parasitic disease deaths is disproportionately higher for males than females and for Black and Hispanic people than members of the other RE groups. For instance, the percentage of all-ages infectious and

Box 11.
Infectious and parasitic disease cause-of-death subcategories

Formal title	Brief title	ICD code(s)
HIV	HIV	B20–B24
Sepsis	Sepsis	A40–A41
Viral hepatitis	Hepatitis	B15–B19
Intestinal infectious diseases	Intestinal infections	A00–A09
Other bacterial diseases	Other bacterial diseases	. . .
Leprosy	. . .	A30
Mycobacterial infection	. . .	A31
Listeriosis	. . .	A32
Tetanus	. . .	A33–A35
Diphtheria	. . .	A36
Whooping cough	. . .	A37
Scarlet fever	. . .	A38
Meningococcal infection	. . .	A39
Actinomycosis	. . .	A42
Nocardiosis	. . .	A43
Bartonellosis	. . .	A44
Erysipelas	. . .	A46
Other bacterial infections, not elsewhere classified	. . .	A48
Bacterial infection of unspecified site		A49
All other infectious and parasitic diseases	Other infectious and parasitic diseases	. . .
Tuberculosis	. . .	A16–A19
Certain zoonotic bacterial diseases	. . .	A20–A28
Infections with a predominantly sexual mode of transmission	. . .	A50–A64
Other spirochetal diseases	. . .	A65–A69
Other diseases caused by chlamydia	. . .	A70–A74
Rickettsioses	. . .	A75–A79
Viral infections of the central nervous system	. . .	A80–A89
Arthropod-borne viral fevers and viral hemorrhagic fevers	. . .	A90–A99
Viral infections characterized by skin and mucous membrane lesions	. . .	B00–B09
Other viral diseases	. . .	B25–B34
Mycoses	. . .	B35–B49
Protozoal diseases	. . .	B50–B64
Helminthiases	. . .	B65–B83
Pediculosis, acariasis, and other infestations	. . .	B85–B89
Sequelae of infectious and parasitic diseases	. . .	B90–B94
Other infectious diseases	. . .	B99

SOURCE: ICD-10.

NOTE: . . . = not applicable.

Chart 38.
Infectious and parasitic diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019

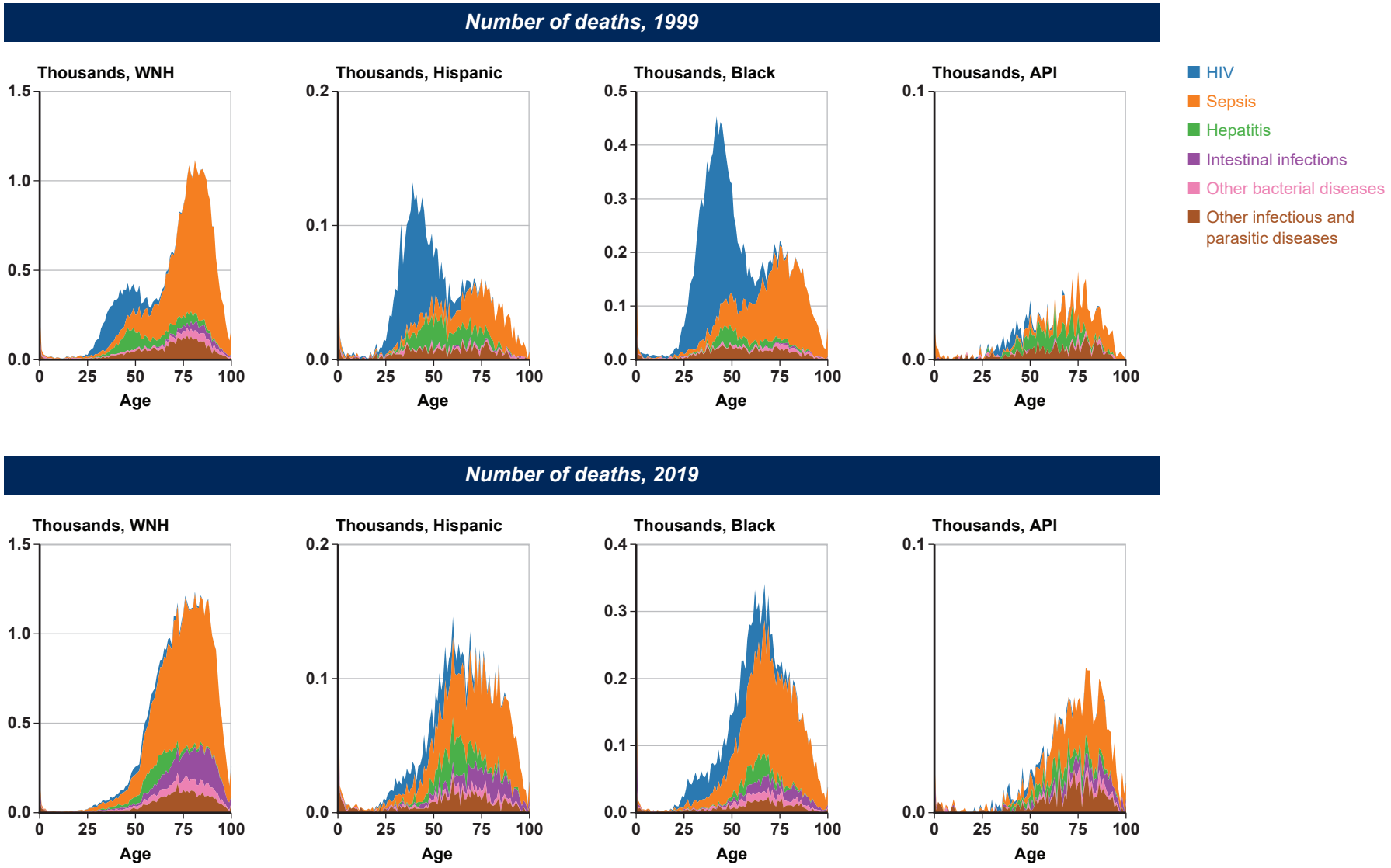


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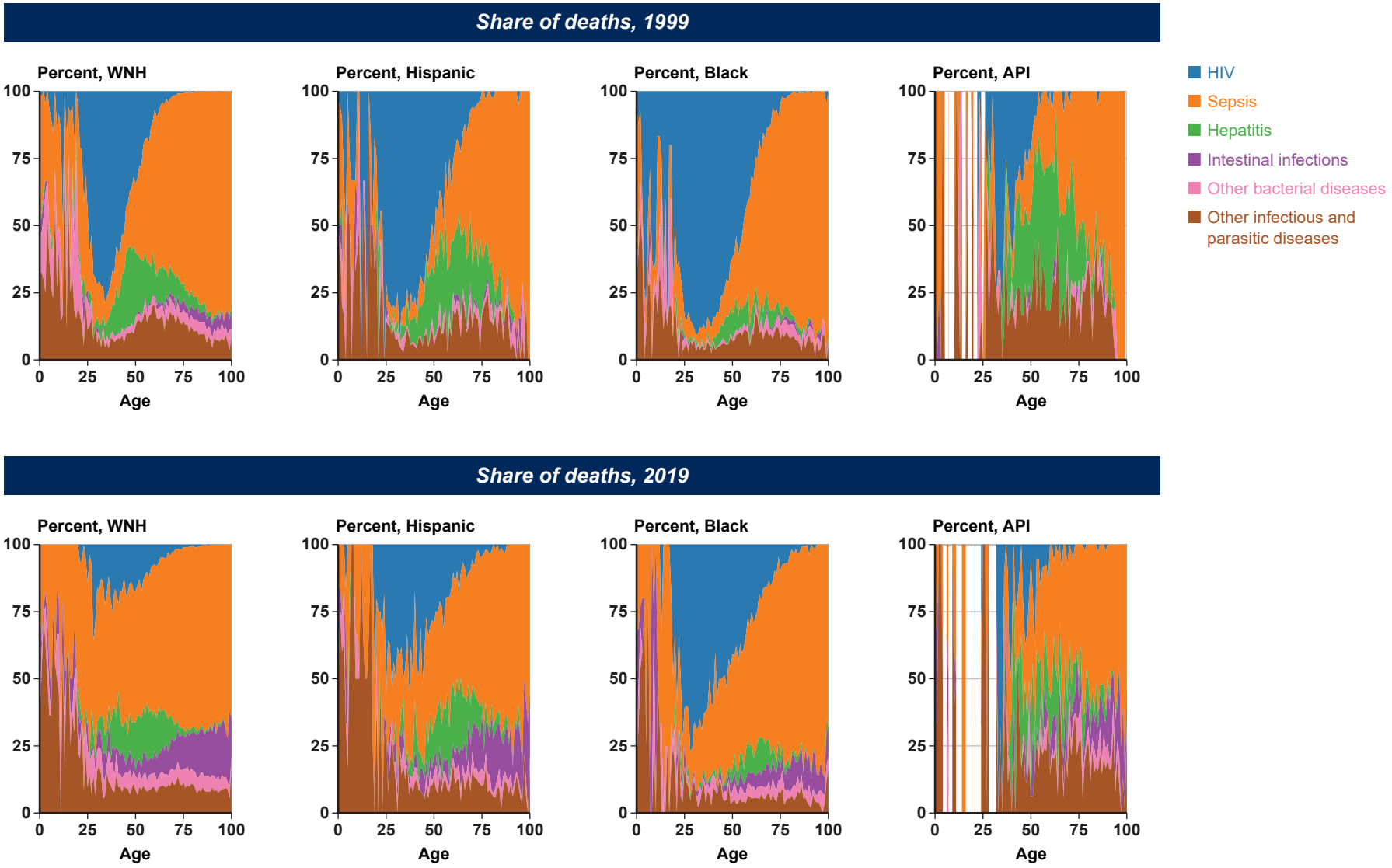
Chart 38.
Infectious and parasitic diseases: Number and percentage distribution of deaths by cause-of-death subcategory, by RE group and age, 1999 and 2019—*Continued*



SOURCE: Author's calculations based on CDC WONDER.

parasitic disease–related deaths that were attributed to HIV in 1999 were 58.4 percent among Black males and 35.8 percent among Black females. The HIV share of infectious and parasitic disease deaths peaked in the midlife ages. In 1999, HIV was the leading cause of infectious and parasitic disease deaths at ages 25–64 in all RE/sex groups other than API men (for whom viral hepatitis was a larger factor) and WNH and API women (for whom sepsis and viral hepatitis, respectively, contributed a larger share of deaths). By 2019, the proportion of infectious and parasitic disease deaths attributed to HIV had declined dramatically, thanks in part to the continued use of highly active antiretroviral therapy. From 1999 to 2019, the percentage of infectious and parasitic disease–related deaths caused by HIV at all ages declined from 49.1 percent to 22.4 percent in the Black population.

Chart 39 shows age-adjusted death rates for 1999–2019 by RE group, sex, and age group. Panel A shows the rates for infectious and parasitic diseases overall.

Chart 39, Panel B shows that Black males had the highest all-ages HIV mortality rates, followed by Black females and Hispanic males. In 1999, the all-ages mortality rate among Black males (36.1) was 9 times greater than that of WNH males (4.0). Likewise, the all-ages HIV-related death rate for Black females and Hispanic males exceeded the HIV mortality rate for WNH males by factors of 3.3 and 2.7, respectively. From 1999 to 2019, for every RE/sex group, all-ages HIV mortality rates declined, and at ages 25–64, the rates declined substantially. Over all ages combined, the HIV mortality rate in 2019 was less than one-fourth the 1999 rate among Black males and Hispanic males and females, and less than one-third the 1999 rate among Black and API females and WNH males. Nevertheless, enormous racial disparity remained. In 2019, all-ages HIV mortality rates among Black males, Black females, and Hispanic males exceeded that of WNH males by factors of 7.4, 3.2, and 2.0, respectively.

Sepsis refers to blood poisoning (infection with streptococcus or other bacteria). In 2019, sepsis was the leading cause of infectious and parasitic disease deaths in all RE groups, accounting for 47.0 percent of those deaths among API people, 48.0 percent of those among Hispanic people, 55.1 percent of those among Black individuals, and 62.5 percent of such deaths in the WNH population. The percentages are typically higher among females than males and at older ages than for younger groups.

Chart 39, Panel C shows that in 1999, Black males and females had the highest all-ages sepsis mortality rates (28.9 and 21.9, respectively), followed by WNH males (11.1). Hispanic males and WNH females both had all-ages sepsis death rates close to 10, while API males and females had the lowest mortality rates (7.8 and 5.6, respectively). From 1999 to 2019, all-ages sepsis mortality rates declined in all RE/sex groups, especially among the non-WNH groups. For instance, in 1999, the all-ages sepsis mortality rate for Black males (28.9) was 2.6 times that of WNH males (11.1). By 2019, the death rate among Black males had dropped to 17.9, or 1.7 times that of WNH males. Sepsis mortality rates at ages 65 or older decreased more rapidly than those of the other age groups over the observation period; in fact, at ages 25–64, mortality rates increased for API women and for WNH and Hispanic individuals of both sexes.

Viral hepatitis accounted for disproportionately high shares of infectious and parasitic disease deaths in the API and Hispanic communities. In 1999, for example, it represented almost one-quarter of such deaths in the API population. In 2019, the shares of infectious and parasitic disease deaths that were attributed to viral hepatitis were 5.4 percent for Black people, 6.0 percent among the WNH population, 11.4 percent for Hispanic people, and 11.7 percent in the API community. There is substantial racial disparity in the prevalence of hepatitis B and C in the United States, with API individuals exhibiting disproportionately high infection rates for hepatitis B virus and Hispanic and Black groups experiencing higher prevalence for hepatitis C virus (Carrion and others 2011; Kim and others 2017). In addition, the opioid crisis has exacerbated infection rates (CDC 2017).

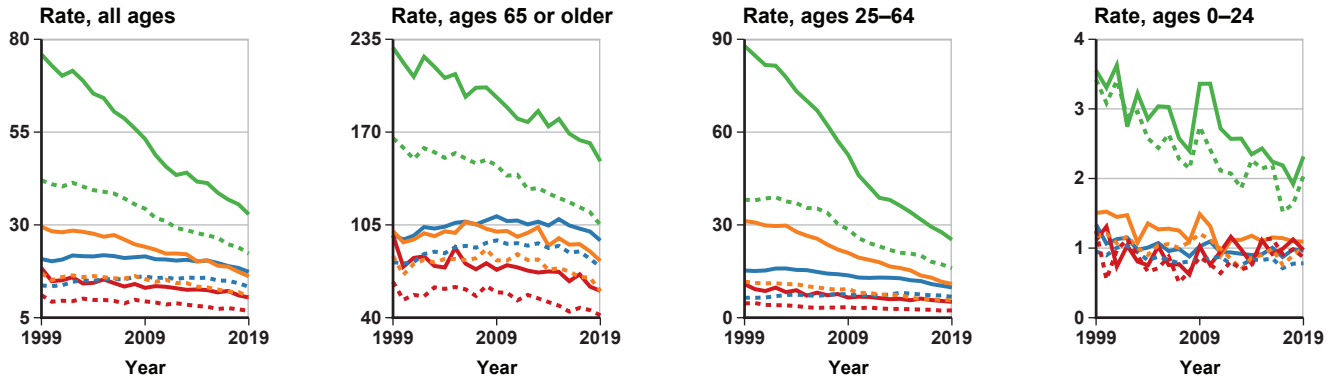
Chart 39, Panel D shows that Hispanic males had the highest all-ages hepatitis mortality rates for most of the 1999–2019 period, followed by Black males. API males had higher death rates than WNH males before 2005 and again from 2017 to 2019. Among females, the Hispanic RE group had the highest all-ages hepatitis mortality rate, while the WNH group had the lowest mortality rate through most of the period. From 1999 to 2019, the all-ages hepatitis death rate declined by more than half for Hispanic and API males, as well as for API, Hispanic, and Black females. There are also significant differences by age group. For example, at ages 65 or older, API and Hispanic men and women had higher hepatitis mortality rates than other groups until 2010. At ages 25–64, however, API women had the lowest mortality rates each year after 2001.

The percentage of infectious and parasitic disease deaths caused by intestinal infections rose

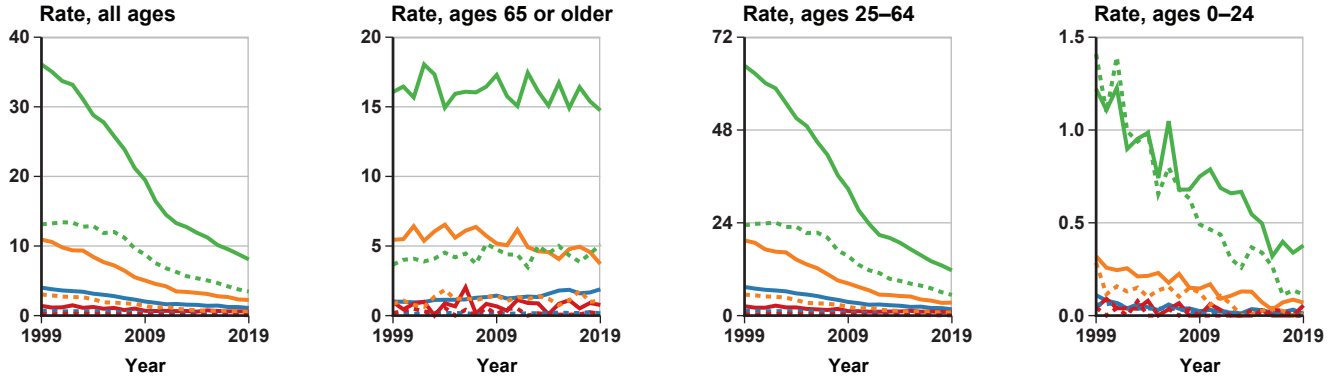
Chart 39.
Infectious and parasitic diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel A: All infectious and parasitic diseases



Panel B: HIV



Panel C: Sepsis

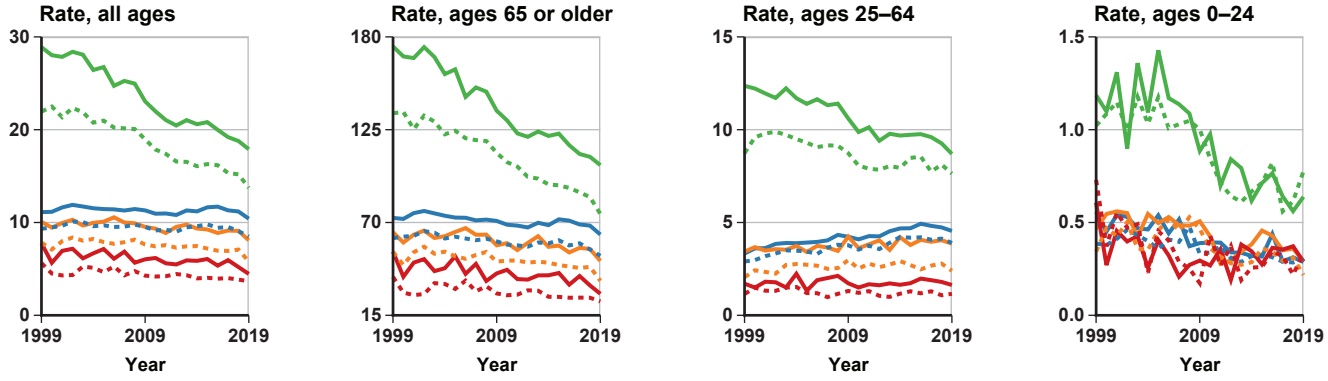


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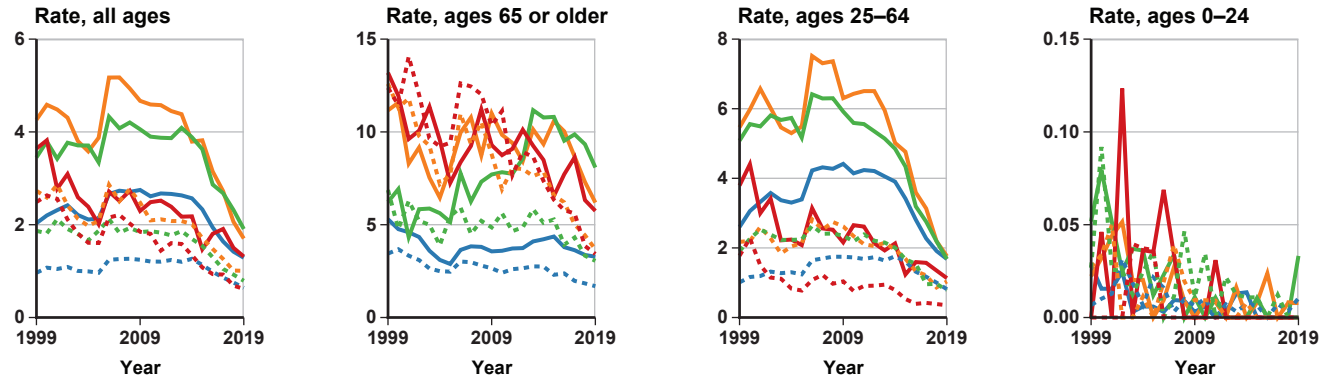
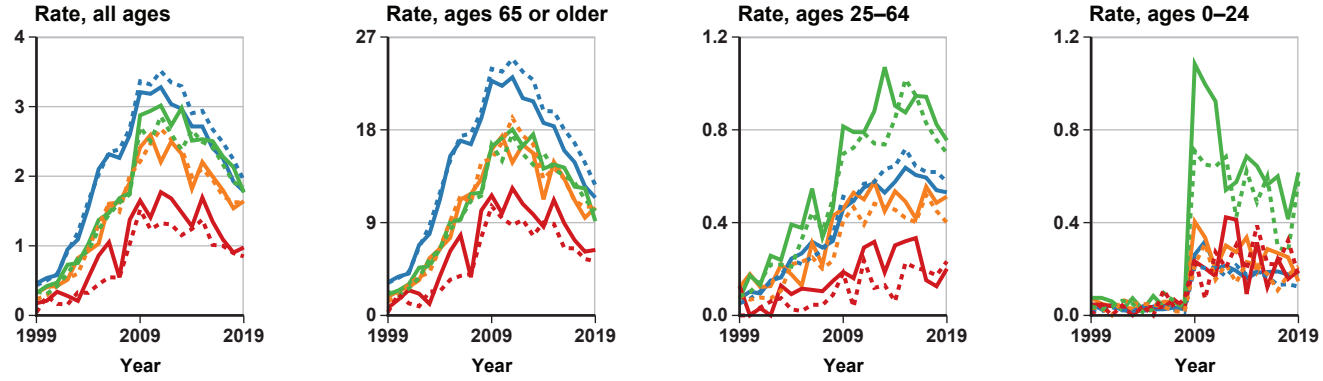
Chart 39.
Infectious and parasitic diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel D: Hepatitis



Panel E: Intestinal infections



Panel F: Other bacterial diseases

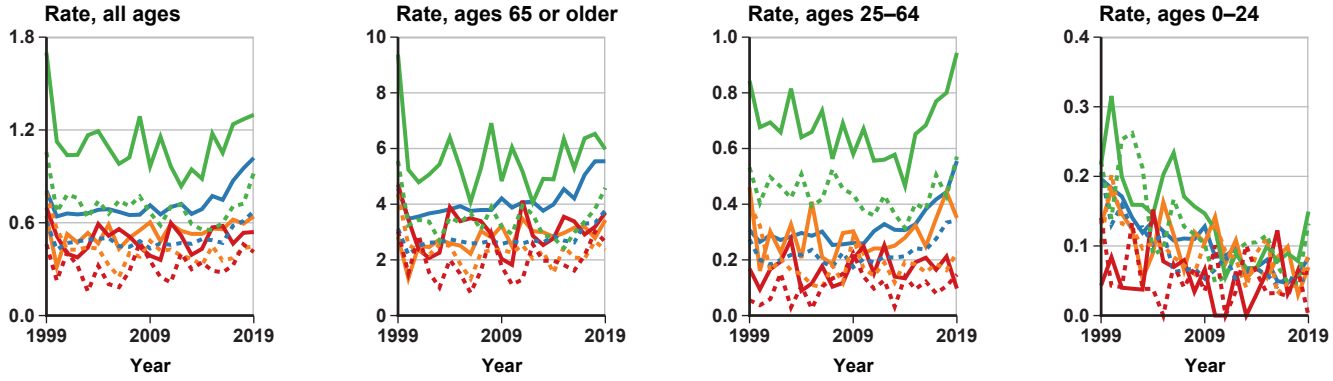


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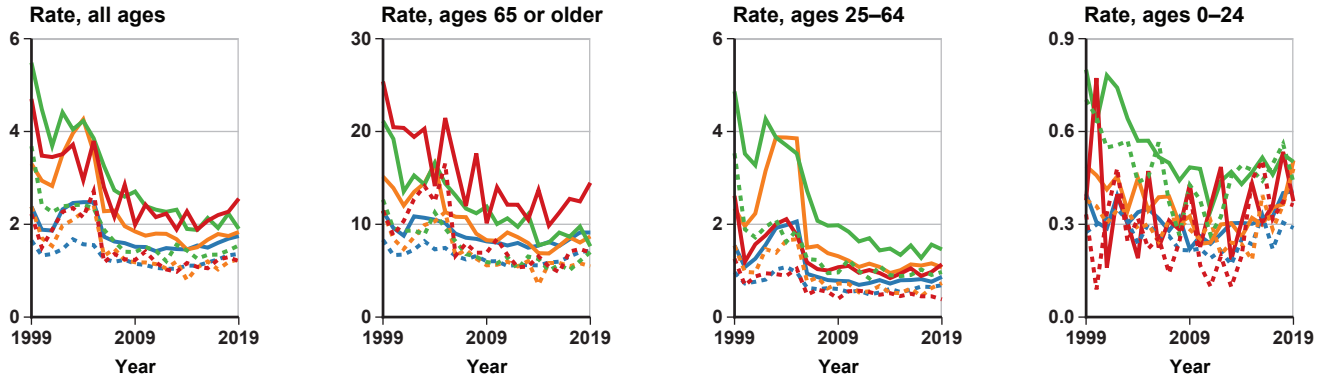
Chart 39.
Infectious and parasitic diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, sex, and age group, 1999–2019—*Continued*

Males: WNH Hispanic Black API Females: WNH Hispanic Black API

Panel G: Other infectious and parasitic diseases



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

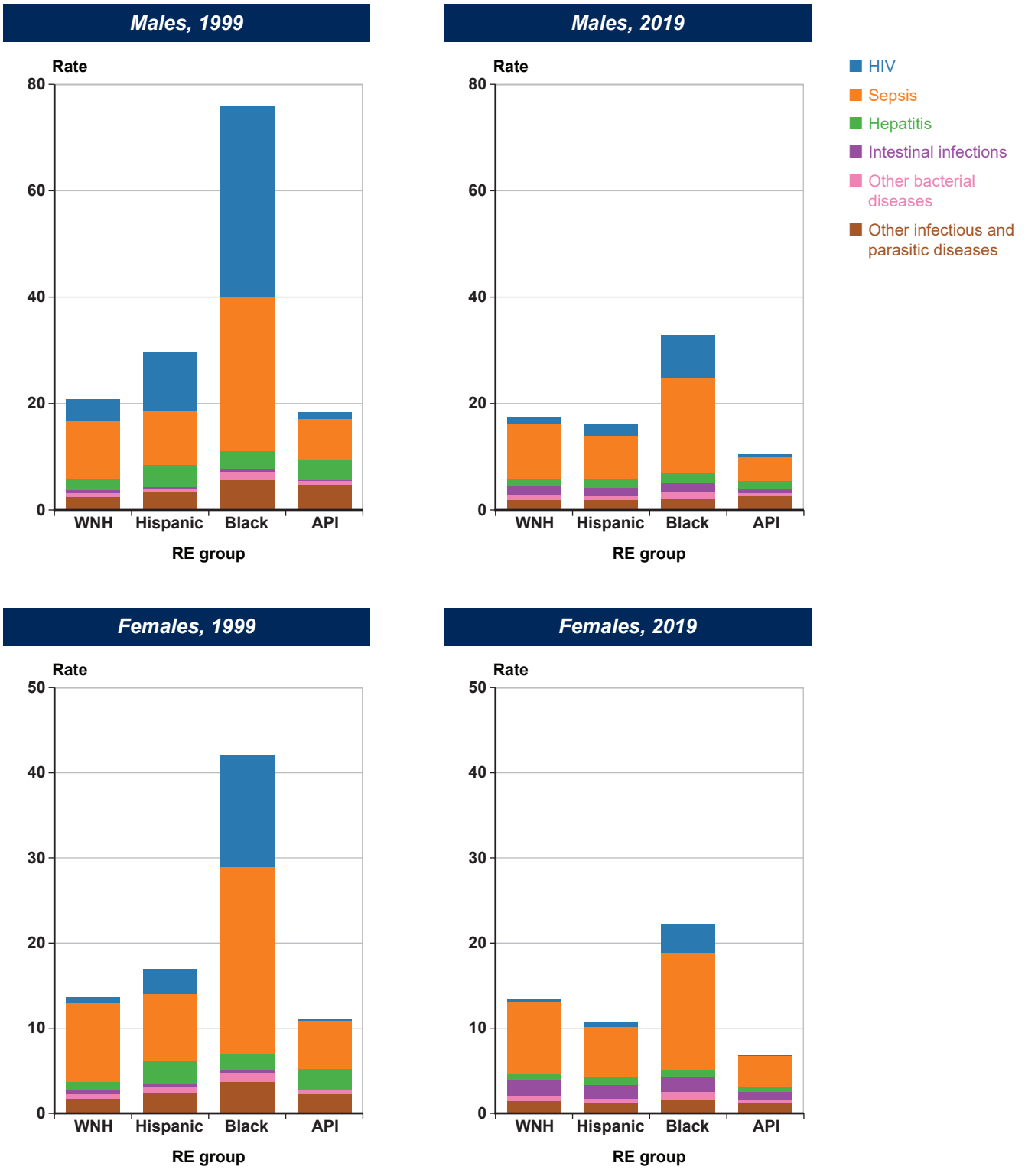
dramatically over the study period. In 1999, intestinal infectious diseases accounted for 2.7 percent of infectious and parasitic disease deaths among WNH people and less than 1 percent of those deaths among all other RE groups. By 2019, the shares of infectious and parasitic disease–related deaths that were caused by intestinal infections were 12.7 percent among WNH people, 11.2 percent among Hispanic individuals, 10.4 percent among API people, and 6.6 percent among Black individuals. The percentage tends to be higher among women than for men. It peaks at the oldest ages; for example, intestinal infections account for almost 20 percent of all infectious and parasitic disease deaths for WNH women older than 84.

Chart 39, Panel E shows that the all-ages intestinal infection death rates rose very rapidly from 1999 to 2010 for all RE/sex groups, then declined. In 2019, WNH and Black females had the highest all-ages intestinal infection mortality rates, followed by WNH and Black males; API males and females had the lowest death rates. From 1999 to 2019, all-ages intestinal infection mortality rates increased by factors of 8 for Hispanic females, 5 or more among Black males and females and API and Hispanic males, and more than 3 among WNH males and females.[25]

The two remaining infectious and parasitic disease cause-of-death subcategories are "other bacterial diseases" and the residual group "all other infectious and parasitic diseases." Other bacterial diseases represented 4.0 percent of infectious and parasitic disease deaths in 2019 among Hispanic and Black people and 5.4 percent of deaths in the WNH and API communities. The all-ages other bacterial disease mortality rate in 2019 (Chart 39, Panel F) was highest for Black and WNH males, followed by Black and WNH females. "All other infectious and parasitic diseases" includes viral infections of the central nervous system (such as polio, rabies, meningitis, and encephalitis), tuberculosis, protozoal diseases, and sequelae of infectious and parasitic diseases. The percentage of infectious and parasitic disease deaths at all ages attributed to this subcategory ranged from 6.4 percent among Black individuals to 21.4 percent in the API population in 2019, although the shares were substantially higher among those aged 0–24. Chart 39, Panel G shows that in 2019, API males had the highest all-ages other infectious and parasitic disease mortality rate (2.6), followed by Black males (1.9) and Hispanic males (1.8). Among females, the Black population had the highest mortality rate (1.5) and the Hispanic and API groups had the lowest rate (1.2).

Chart 40 shows the all-ages infectious and parasitic disease mortality rates by cause-of-death subcategory, RE group, and sex in 1999 and 2019. In 1999, the death rates attributed to HIV (36.1) and sepsis (28.9) among Black males were so high that either one by itself matched or exceeded the combined mortality rate for all infectious and parasitic diseases in each

Chart 40.
Infectious and parasitic diseases: Age-adjusted mortality rates, by cause-of-death subcategory, RE group, and sex, 1999 and 2019 (all ages combined)



SOURCE: Author's calculations based on CDC WONDER.

NOTE: Rates are per 100,000 population.

of the other RE groups. For Black females, the sepsis death rate (21.9) exceeded the combined infectious and parasitic disease death rates of females in the other RE groups, and the HIV death rate (13.1) nearly did so. Black females experienced higher infectious and parasitic disease mortality than any RE/sex group other than Black males. For both sexes, Hispanic people had higher infectious and parasitic disease mortality rates than WNH individuals, as their lower death rates from sepsis were more than offset by higher mortality from HIV, hepatitis, and the residual subcategory all other infectious and parasitic diseases. The API population, on the other hand, had the lowest overall infectious and parasitic disease mortality, as death rates from hepatitis and the other-infectious-disease subcategory, which were higher than those of the WNH population, were offset by lower mortality from sepsis and HIV. By 2019, mortality rates had declined in all RE/sex groups and for most major subcategories (except intestinal infectious diseases), with Hispanic males and females experiencing lower overall infectious and parasitic disease mortality rates than their WNH counterparts. However, the sepsis mortality rates among Black males and females still exceeded the mortality rates for all infectious and parasitic diseases combined in the other RE groups in 2019.

Other Causes of Death

In 2019, the shares of all deaths that were caused by:

- musculoskeletal system diseases ranged from 0.47 percent for API people to 0.58 percent in the Black population;
- blood and blood-forming organ diseases ranged from 0.33 percent for the API population to 0.65 percent among Black individuals;
- conditions arising in the perinatal period ranged from 0.18 percent in the WNH population to 1.08 percent for Hispanic people;
- congenital anomalies ranged from 0.27 percent in the WNH community to 0.81 percent for Hispanic people;
- skin diseases ranged from 0.17 percent for API people to 0.24 percent for Black individuals;
- complications of childbirth ranged from 0.02 percent for WNH individuals to 0.11 percent in the Black community; and
- abnormal clinical findings not elsewhere classified ranged from 0.86 percent for API people to 1.33 percent in the Black community.

Notably, the United States has the highest maternal and infant mortality rates among comparable developed countries. Black mothers and their infants experience death rates several times higher than those of their peers in other RE groups. Age-adjusted mortality rates from complications of pregnancy, childbirth, and the puerperium increased over the 1999–2019 period. The maternal mortality rate in 2019 for Black women was 2.5 times the rate for WNH women and 3.5 times the rate for Hispanic women (Hoyert 2021). Similarly, deaths caused by conditions originating in the perinatal period (which include disorders related to the length of gestation and fetal growth; complications of pregnancy, labor, and delivery; and any other medical conditions related to the perinatal period) were substantially higher for Black infants. Another major cause of death shortly after birth is congenital malformations, deformations, and chromosomal abnormalities, for which mortality is significantly higher in the Black community than for any other RE group. The death rate for Black infants in 2018 was twice that of infants born to WNH mothers.

Summary

Mortality differentials by RE group and sex affect Social Security retirement and disability program-participation outcomes. This article summarizes and compares recent trends (1999–2019) in cause-specific mortality among four major RE groups in the increasingly diverse U.S. population. From 1999 to 2019, the WNH population increased by about 3.8 million. By contrast, the Hispanic, Black, and API populations respectively increased by 26.6 million, 10.4 million, and 10.5 million. The Hispanic community is the youngest RE group, as 42.2 percent of its population was younger than 25 in 2019, compared with only 27.3 percent of the WNH population. Immigration has influenced faster growth in the API and Hispanic populations than in the other groups and since about 2010, newly arrived API immigrants have been outnumbering Hispanic arrivals. The public's evolving perceptions about racial and ethnic identity and the rising share of ethnoracially mixed families pose a challenge to the future collection of data on race and ethnicity, and to their comparability with earlier data, as larger numbers of Americans will straddle multiple backgrounds and have many options for defining their RE identity.

U.S. mortality patterns vary geographically. The highest age-adjusted all-cause mortality rates are observed in most of the South along with some areas

of the Midwest, Great Lakes, and Ohio Valley regions. The states with the highest percentages of Black residents are mostly in the South. The Hispanic population concentrates heavily along the Southern border, the West coast, and South Florida. Many API communities are located on the West coast and in portions of the Northeast Corridor. Nationwide, within a given RE group, males have higher all-cause mortality rates than females. For either sex, the Black community has the highest mortality rate, followed by the WNH population. The Hispanic population has a lower all-cause mortality rate than WNH people, a phenomenon often referred to as the Hispanic mortality paradox, given the WNH community's advantages in socioeconomic status. The API population enjoys the lowest all-cause age-adjusted death rates.

Much of the all-cause mortality rate improvement between 1999 and 2019 occurred during the first half of the period. By 2010, mortality rates began to decline at a substantially slower pace for all RE groups. Americans in the midlife years (ages 25–64) began experiencing a surge in deaths driven by the effects of drug overdoses, alcohol abuse, and suicides, often referred to as deaths of despair. All-cause age-adjusted death rates at ages 25–64 were higher in 2019 than in 2010 in most subpopulations, as the opioid epidemic, which initially affected primarily the WNH community, began to spread across all demographic groups. Over the entire 1999–2019 period, all-cause mortality rates within a given RE group improved faster for males than for females, narrowing the gender gap. In addition, mortality rates improved at a slower rate among the WNH population than for other RE groups, reducing the WNH-Black mortality gap. Nevertheless, in 2019, Black females had higher all-cause mortality rates than both API and Hispanic males, while WNH females had higher mortality rates than API males.

Diseases of the circulatory system are the most common all-ages cause-of-death category. The proportion of all deaths that are caused by circulatory system diseases has steadily declined over time, yet in 2019 the proportion still ranged, across RE groups, from 27.6 percent among the Hispanic population to 32.2 percent among Black individuals. From 1999 to 2019, all-ages circulatory system disease mortality rates for all RE/sex groups declined by more than one-third, and most of the improvement occurred during the first decade of the period and at a faster pace for the aged than for those in the midlife years. By 2010, circulatory system disease mortality rates either had begun to decline at a slower rate, outright flattened, or increased among those in the midlife ages. The pause in the decline of circulatory system disease mortality rates contributed to the rise in all-cause mortality in the midlife ages seen in the second decade of the observation period. Black males had the highest all-ages circulatory system disease mortality rates, followed by WNH males and Black females. Ischemic and cerebrovascular diseases accounted for more than half of circulatory system disease–related deaths among Black and WNH individuals and almost two-thirds of those in the Hispanic and API populations in 2019. The substantial decline in mortality caused by ischemic and cerebrovascular diseases throughout the 2000s more than offset the increased mortality in other circulatory system–related causes, such as hypertensive disease and heart failure, that began in 2010. Among all RE/sex groups in 2019, Black females had the highest age-adjusted death rate from pulmonary heart disease; they also had the second highest mortality rate, following Black males, for cerebrovascular disease, hypertensive disease, and cardiac arrest; and they had the third highest mortality rate, after Black and WNH males, from heart failure, cardiomyopathy, other cardiac arrhythmias, and diseases of the arteries, arterioles, and capillaries.

Cancers (neoplasms) were the second most common cause-of-death category after circulatory system diseases, accounting for more than one-fifth of all deaths in 2019. Unlike the pattern for circulatory diseases, cancer death rates generally declined steadily throughout the 1999–2019 period. Black males had the highest all-ages mortality rate, followed by WNH males, Black females, and WNH females. Black and WNH females both had a higher cancer-related mortality rate in 2019 than Hispanic and API males. However, the mortality rates of Black males and females improved more rapidly than those of any other RE/sex group, narrowing substantially the mortality gap with the WNH population. In addition, the gender gap in cancer death rates narrowed over the observation period for every RE group.

Among males in 2019, the Black RE group had the highest mortality rates in six cancer subcategories: neoplasms of the respiratory and intrathoracic organs (lung cancer); of the genital organs; of the pancreas; of the colon; of other digestive system organs (esophagus, stomach, small intestine, and rectum); and of ill-defined, other secondary, and unspecified sites.[26] The WNH RE group had the highest death rates in six other subcategories: neoplasms of the lymphoid, hematopoietic, and related tissue (such as leukemia

and lymphoma); of the urinary tract (primarily kidney and bladder cancers); of the eye, brain, and other parts of the central nervous system; of the lip, oral cavity, and pharynx; of the skin (such as melanoma); and in the residual "all other cancers" subcategory.

Of the specific cancer subcategories, for females in 2019, the Black RE group had the highest death rates associated with neoplasms of the lymphoid, hematopoietic, and related tissue (leukemia and lymphoma); of the breast; of the genital organs (cervical, uterine, and ovarian cancers); of the pancreas; of the colon; of other digestive system organs (esophagus, stomach, small intestine, and rectum); and of ill-defined, other secondary, and unspecified sites. The WNH group had the highest mortality rates in six neoplasm subcategories (lung, urinary tract, eye/brain/nervous system, oral, and skin cancers, as well as the "all other cancers" subcategory). The death rates associated with most cause-specific cancers declined throughout the 1999–2019 period, resulting in substantial cancer mortality-rate improvement for all RE/sex groups. Neoplasms of the liver and intrahepatic bile ducts are an exception, in that mortality rates declined only for the API population but increased significantly for the other RE groups, regardless of sex. Until about 2013, however, the API community had a higher mortality rate in this subcategory than did any other RE group. Rising liver cancer rates in the Hispanic, WNH, and Black populations have generally been attributed to the spread of hepatitis C, while the disproportionately high rate of liver cancer incidence in the API community is linked to the high prevalence of chronic hepatitis B in the API population, whether U.S.- or foreign-born.

Depending on the RE group, about 7–10 percent of all deaths in 2019 were caused by diseases of the respiratory system. This category represents an unusual exception, in that age-adjusted mortality rates are higher among WNH males and females than their Black counterparts. The disparity is driven by mortality at ages 65 or older, because Black people in the midlife years and younger ages experience higher death rates than any other RE group of the same sex. The leading specific cause of death among respiratory disorders is chronic lower respiratory disease (primarily COPD but also emphysema and asthma), followed by influenza/pneumonia. Over the 1999–2019 period, respiratory system disease mortality declined substantially, particularly among the non-WNH population. Nevertheless, mortality in the midlife ages was higher in 2019 than in 2010 in every RE/sex group. In 2019, WNH males and females had the highest and second highest all-ages mortality rates associated with chronic lower respiratory disease, while Black people experienced higher death rates from influenza/pneumonia than any other RE group of the same sex. On the other hand, the Hispanic community had a disproportionately large percentage of respiratory disorder–related deaths attributed to interstitial respiratory diseases (such as pulmonary fibrosis). In 2019, among RE/sex groups, Hispanic males and females experienced the second and third highest all-ages mortality rates from interstitial respiratory disease, after WNH males.

The proportion of deaths attributed to external causes, such as injuries resulting from accidents and assaults, was substantially higher in the younger and midlife age groups than for those aged 65 or older. Across RE groups in 2019, the share of all deaths attributed to external causes ranged from 7.6 percent among API people to 12.9 percent in the Hispanic population. External causes were the third leading cause-of-death category for Hispanic and Black males at all ages, following only circulatory system diseases and neoplasms. All-ages external-cause mortality rates were significantly higher among males than females. For WNH males and females, the rates rose steadily throughout the 1999–2019 period. For the other RE/sex groups, the rates rose after about 2013. For males, the Black RE group had the highest external-cause mortality rate, followed by the WNH and Hispanic groups. Among females, the WNH group had the highest all-ages external-cause mortality rate from 2002 to 2019. No other cause-of-death category exhibited greater heterogeneity by RE group or such compositional variation over the two decades. Assaults constituted disproportionately larger shares of external-cause deaths for the Black and Hispanic communities, while suicides accounted for greater shares of such deaths in the WNH and API populations. In addition, the percentage of external-cause deaths attributed to accidental poisonings (largely from drug and alcohol overdoses), as well as to falls at older ages, rose dramatically over the 1999–2019 period. Increasing mortality from falls is likely associated with the rising prevalence of dementia and degenerative disorders of the nervous system and to the increasing use of medications that raise the risk of falling.

In 1999, transportation accidents were the leading external cause of death for every RE/sex group other than Black males. By 2019, however, transportation accidents were the leading external cause of death only among Hispanic females. Each year during

1999–2019, more Black males died as a result of assault than from any other external cause. In 2019, the all-ages assault-related mortality rate for Black males was more than 10 times that of WNH males. By contrast, mortality rates from suicide among WNH males and females were double those of their Black counterparts. Suicide was also the leading external cause of death for API males in 2019. Furthermore, the rate of mortality caused by falls increased significantly among the aged in all RE/sex groups from 1999 to 2019, becoming the leading external cause of death over all ages combined for API females. Finally, the opioid epidemic drove an increase in poisoning-related mortality, such that it had become the leading external cause of death for WNH and Black females and for WNH and Hispanic males by 2019. Among females, the poisoning-related mortality was highest for the WNH RE group, for whom the all-ages death rate rose more than six-fold during the 1999–2019 period. Among males, the WNH group had the highest accidental poisoning mortality rate from 2003 until 2019, when the rate for the Black group surpassed it. The growth in opioid-involved overdose deaths among Black people now outpaces that of any other RE group, as fentanyl and other synthetic opioids disproportionately affect overdose death rates among older people in the Black community.

The shares of deaths that are caused by diseases of the nervous system and by mental and behavioral disorders rapidly expanded in the observation period, driven primarily by rising mortality at older ages associated with Alzheimer's and Parkinson's diseases, other degenerative diseases of the nervous system not elsewhere classified (including senile degeneration of the brain and degeneration of the nervous system because of alcohol), and unspecified dementia and other organic mental disorders. Also driving the rising shares of deaths attributable to the mental/behavioral and nervous system categories were increases in mortality at younger ages from mental and behavioral disorders caused by psychoactive substance use (which overwhelmingly involves alcohol). The percentage of all deaths attributed to the combination of mental/behavioral disorders and diseases of the nervous system rose in the WNH population from 5.7 percent in 1999 to 13.9 percent in 2019. WNH males and females had the highest all-ages mortality rates associated with diseases of the nervous system, followed by Black males and females. In each RE group, the age-adjusted nervous system disease mortality rates were similar between males and females, despite significant gender differences in mortality by specific cause. For example, Alzheimer's disease mortality rates were substantially higher for women than men. Conversely, mortality associated with Parkinson's disease in men was at least twice that of women. Among mental and behavioral disorders, WNH and Black women had the highest death rates caused by unspecified dementia, followed by Black and WNH men. In addition, death rates from mental and behavioral disorders caused by psychoactive substance use began to rise among all RE/sex groups around 2010, exhibiting developments associated with increasing numbers of deaths of despair.

Across RE groups, the shares of all deaths that were caused by endocrine, nutritional, and metabolic diseases ranged in 2019 from 4.5 percent in the WNH population to 6.5 percent for Black and Hispanic people. Age-adjusted endocrine, nutritional, and metabolic disease mortality rates declined for all RE/sex groups between 1999 and 2010, but increased thereafter for most groups. As a result, mortality rates were higher in 2019 than in 1999 for WNH, Black, and API males. The gender gap in mortality widened considerably in all RE groups over the 1999–2019 period, with males experiencing disproportionately higher mortality rates than females. In 2019, Black males had the highest all-ages endocrine, nutritional, and metabolic disease mortality rate, followed by Black females and Hispanic males. Hispanic females had higher all-ages endocrine, nutritional, and metabolic disease mortality rates than WNH males until 2007. Hispanic males and females experienced higher all-ages endocrine, nutritional, and metabolic disease mortality rates than their WNH counterparts, although the gap narrowed considerably over the observation period. Diabetes is by far the most common cause of death among endocrine, nutritional, and metabolic diseases, accounting in 2019 for two-thirds to three-quarters of deaths in this category, depending on the RE group. During the 21-year period, diabetes mortality rates improved for all RE/sex groups other than API males. However, death rates associated with metabolic disorders, obesity, and malnutrition rose in every RE/sex group. Malnutrition is a serious health issue among the aged, for whom decreased appetite, poor dental health, loneliness, failing health, lack of mobility, depression, and cognitive disorders affecting memory and behavior are contributing risk factors.

Across RE groups, the shares of all deaths caused by diseases of the digestive system ranged in 2019 from 3.0 percent in the Black community to 5.7 percent

among Hispanic individuals. Alcoholic liver disease and other disorders of the liver accounted for 70 percent of digestive system disease–related deaths for the Hispanic population and almost half of those in the WNH community. In 2019, Hispanic males had the highest all-ages alcoholic liver disease death rate, followed by WNH males. Among females, the WNH group had the highest all-ages alcoholic liver disease mortality rate, followed by the Hispanic group. Regardless of sex, Black individuals in 2019 had lower alcoholic liver disease mortality rates than their Hispanic and WNH counterparts. From 1999 to 2019, age-adjusted mortality rates in the midlife years for diseases of the digestive system rose significantly for WNH men and women but declined for the Black, Hispanic, and API populations. This development is in part the result of the rise in deaths of despair, as suggested by the significant increase in mortality from alcoholic and other liver diseases among WNH men and women.

The shares of deaths that were caused by diseases of the genitourinary system ranged in 2019 from 2.4 percent in the WNH community to 3.5 percent among the Black population. Renal failure accounted for at least two thirds of the deaths in this category, followed by other disorders of the urinary system (primarily involving urinary tract infections of unspecified site). Black males and females respectively had the highest and second highest all-ages genitourinary system–related mortality rates, which in 2019 were close to twice those of their WNH counterparts.

Across RE groups, the share of all deaths attributable to infectious and parasitic diseases ranged in 2019 from 2.0 percent for WNH people to 3.3 percent for Black people. Those shares declined over the 1999–2019 period, as HIV mortality rates dropped dramatically. In 1999, HIV accounted for more than half of infectious and parasitic disease deaths among Black and Hispanic males, while sepsis (infection caused by large amounts of bacteria entering the bloodstream) was the leading specific cause of infectious and parasitic disease death in all other RE/sex groups. By 2019, the all-ages HIV death rate was less than one-fourth the 1999 rate among Black males and Hispanic males and females, and less than one-third the 1999 rate among Black and API females and WNH males. Nevertheless, enormous RE-group disparity remained in 2019, when HIV mortality rates among Black males, Black females, and Hispanic males exceeded that of WNH males by factors of 7.4, 3.2, and 2.0, respectively. From 1999 to 2019, infectious and parasitic disease mortality declined in all RE/sex groups and for major specific causes (except intestinal infectious diseases), with Black males and females experiencing higher all-ages death rates than any other RE/sex group. By the second half of the period, Hispanic males and females had lower infectious and parasitic disease mortality rates than their WNH counterparts.

Finally, the United States has the highest maternal and infant mortality rates among comparable developed countries. Black mothers and their infants experience death rates several times higher than those of their peers in other RE groups. Age-adjusted mortality rates from complications of pregnancy, childbirth, and the puerperium increased over the 1999–2019 period. The maternal mortality rate in 2019 for Black women was 2.5 times the rate for WNH women and 3.5 times the rate for Hispanic women (Hoyert 2021). Similarly, deaths caused by conditions originating in the perinatal period (which include disorders related to the length of gestation and fetal growth; complications of pregnancy, labor, and delivery; and any other medical conditions related to the perinatal period) were substantially higher for Black infants. Another major cause of death shortly after birth is congenital malformations, deformations, and chromosomal abnormalities, for which mortality is significantly higher in the Black community than for any other RE group. The death rate for Black infants in 2018 was twice that of infants born to WNH mothers.

Notes

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[1] The ICD-10 is available at https://icd.who.int/browse10/2019/en. The 11th revision (ICD-11, available at https://www.who.int/standards/classifications/classification-of-diseases) was released after this research was conducted, but as of May 2024, the CDC WONDER database continues to use the ICD-10 classifications.

[2] Arias and others (2022) reported that "excess deaths due to COVID-19 and other causes in 2020 and 2021 led to an overall decline in life expectancy between 2019 and 2021 of 2.7 years for the total population, 3.1 years for males, and 2.3 years for females," with the Hispanic and Black communities experiencing substantially higher declines. Holman and MacDonald (2022) provided an update of the 2020 cause-specific mortality experience in the United States. In addition, COVID mortality differentials by race have evolved over time and remain a subject of active research (Johnson and Keating 2022).

[3] Data for 1968–1978 are coded using ICD-8 and data for 1979–1998 are coded using ICD-9. The classification revisions differ enough to complicate direct comparison of cause-of-death data.

[4] For further details on age adjustment and the 2000 U.S. standard population, see https://www.cdc.gov/nchs/hus/sources-definitions/age-adjustment.htm.

[5] The CDC WONDER database provides the Census Bureau population estimates. Race bridging is a technique used to make the 31 race categories used in the 2000 and 2010 decennial censuses of the U.S. population compatible with the four race categories specified in the 1977 Office of Management and Budget standards (see https://www.cdc.gov/nchs/nvss/bridged_race.htm).

[6] Flagg and Anderson (2021) summarized the process.

[7] The racial categories and labels used in this article follow the 1977 Office of Management and Budget standards and are determined by the available data.

[8] As its name implies, the WNH category is an exception. Individuals who identify as White and Hispanic are included in the Hispanic group but not the WNH category.

[9] Whether referring to immigrants or the U.S.-born, the API group encompasses a widely heterogenous people who trace their origins to dozens of separate nations spanning East Asia, Southeast Asia, the Indian subcontinent, and the Pacific Islands, where several hundred languages and dialects are spoken.

[10] As noted earlier, there is some small overlap among the non-WNH RE groups, which is ignored for the purposes of this discussion.

[11] Population counts below a certain threshold are suppressed to prevent the possible identification of individuals.

[12] Maryland is one of several states that recognizes independent cities as county-equivalent jurisdictions.

[13] As Pacific Islanders, Native Hawaiians are included in the API group.

[14] CDC deems crude death rates calculated from fewer than 20 deaths to be statistically unreliable.

[15] The mortality experience of Hispanic individuals shows a great deal of heterogeneity by age, country of origin, and whether foreign-born, suggesting that the mortality advantage does not apply equally to all Hispanic subgroups. Instead, it is consistently stronger among foreign-born Hispanics and tends to be more pronounced at older ages (Fenelon, Chinn, and Anderson 2017).

[16] The total count includes the comparatively low number of deaths among the AIAN population, and the total counts for the cause-of-death categories discussed later likewise include those in the AIAN population. However, as noted earlier, all other figures reported in this study exclude deaths among AIAN individuals (unless they also belong to at least one of this study's four RE groups).

[17] In this article, "cancer" and "neoplasms" refer to malignant neoplasms, unless otherwise specified.

[18] All-cause mortality rates at all ages improved for both males and females in every RE group from 1999 to 2019, with much of the mortality decline taking place by 2009. All-cause mortality rates at ages 25–64, on the other hand, rose after 2014 for all RE groups.

[19] Queens County (NY), with more than 2.2 million residents and an age-adjusted mortality rate of 506.8, narrowly misses inclusion in the group.

[20] County-level data are omitted to avoid statistical reliability problems associated with small sample sizes for certain RE groups in many counties.

[21] The authors focused on the non-Hispanic Black population.

[22] Swigris and others (2012) explored the differences by race and ethnicity.

[23] During the COVID-19 pandemic, drug overdose deaths increased even more sharply, rising by 30 percent in 2020 and another 15 percent the following year (CDC 2022).

[24] Such increases in apparent mortality rates may reflect factors besides a sudden steep rise in incidence. For example, epidemiological monitoring of certain diagnoses may become a priority, leading to the identification of cases that would previously have been classified under a different diagnosis. Nevertheless, even sharp increases in mortality for a given cause might be undercounted (Stokes and others 2020).

[25] In addition, the rates for API females increased by a factor of more than 20, from 0.04 in 1999 to 0.85 in 2019.

[26] Although breast cancer among males is uncommon, death rates in that subcategory also are higher in the Black population than in the other RE groups.

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