A Detroit woman listens to South African political activist Nelson Mandela speak in June 1990 shortly after his release from prison.

3 National Maps of Stroke Mortality by Race, Ethnicity, and Gender

In this section, national geographic disparities in stroke death rates are presented for the total U.S. population and for the five largest racial and ethnic groups in the United States—American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and whites. A map depicting rates for the total population of each racial and ethnic group is followed by separate maps for women and men in each group.

Each national map presents spatially smoothed, age-adjusted stroke death rates for counties across the United States. Hawaii, New York City, and the District of Columbia are displayed using a larger scale than the rest of the nation to enhance visualization of these areas. Alaska is shown using a smaller scale because of the large land area it occupies.

For American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, and Hispanics, stroke death rates were not calculated for a majority of counties nationwide because of small population sizes and infrequent stroke deaths in these counties. If a county and its neighboring counties reported fewer than 20 stroke deaths for a specific racial or ethnic group during 1991–1998, then a rate was not calculated for that county (see Appendix B for more details).

For part of the study period, Oklahoma and New Hampshire did not collect data on Hispanic origin on death certificates. Consequently, we were unable to report stroke death rates for Hispanics in those states. During 1991–1993 in New York City, Hispanic origin was recorded as “unknown” on approximately 18% of stroke death certificates for people ages 35 and older. Therefore, the stroke death rates for Hispanics in New York City may be underestimated.

Total Population

The age-adjusted stroke death rate for U.S. residents ages 35 and older was 121/100,000 during 1991–1998. Stroke is the third leading cause of death in the United States, preceded by heart disease and cancer.

The national map of age-adjusted, spatially smoothed stroke death rates for the total U.S. population shows considerable geographic disparity across the 3,100 counties for which data were available. County death rates ranged from 61 to 241/100,000. An approximately twofold difference existed between the midpoint of the highest quintile (194) and the midpoint of the lowest quintile (87). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for the total population (Figure 3.1). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

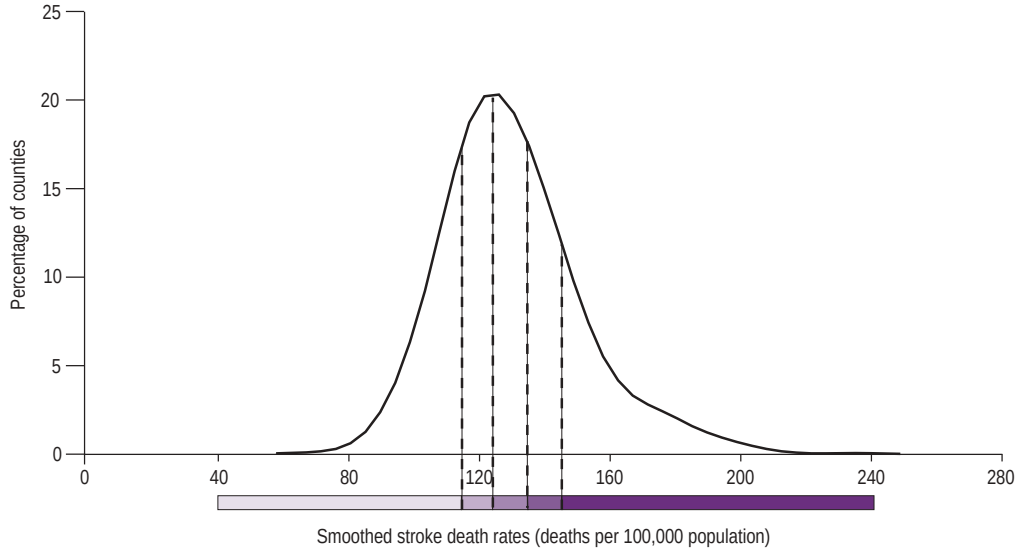
The map for the total population indicates that a majority of the counties in the southeastern states (except Florida) were in the top 40% of stroke death rates. The overall pattern shows that nearly all of the counties in the highest quintile were reported in two areas of the Southeast. The first area covers vast expanses of southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia), as well as part of Alabama. The second area encompasses Mississippi Delta counties in Tennessee, Arkansas, Mississippi, Louisiana, and the southeastern "bootheel" area of Missouri. A separate pocket of counties with high rates was observed in the Pacific Northwest, namely Washington, Oregon, and northern California. Counties in the lowest quintile were reported primarily in the Southwest, the Great Plains, the Northeast, and southern Florida.

All Women and All Men

During 1991–1998, the age-adjusted death rate for stroke was 117/100,000 for women and 126/100,000 for men ages 35 and older. For both women and men, stroke is the third leading cause of death in the United States, preceded by heart disease and cancer.

The maps of age-adjusted, spatially smoothed stroke death rates for women and men show considerable geographic disparity. For women, county death rates ranged from 58 to 226/100,000. The range for men was 60 to 258/100,000. For both women and men, an approximately twofold difference existed between the midpoint of the highest quintile (184 for women, 206 for men) and the midpoint of the lowest quintile (84 for women, 88 for men).

Figure 3.1
Frequency Distribution of Smoothed County Stroke Death Rates Among All People Ages ≥35 Years, 1991–1998



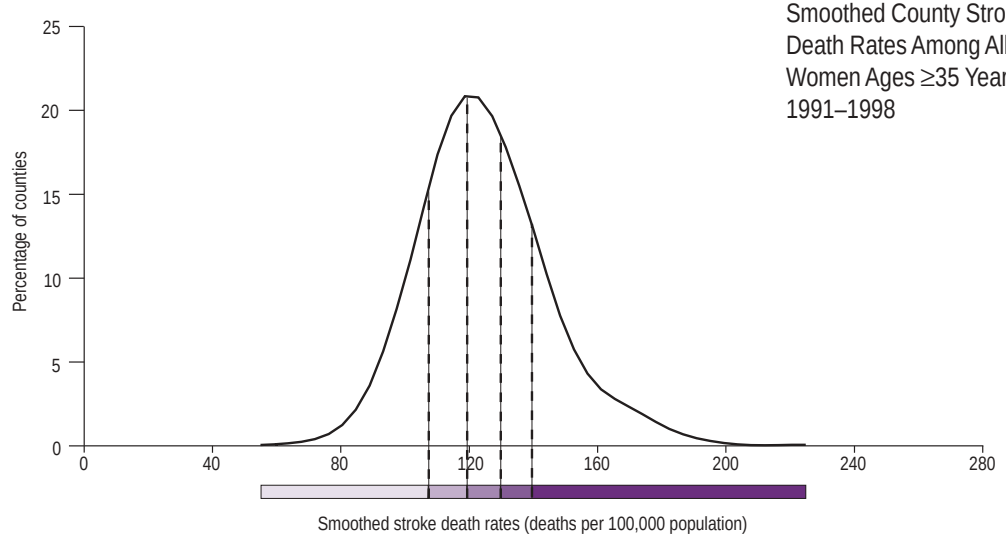


Figure 3.2
Frequency Distribution of Smoothed County Stroke Death Rates Among All Women Ages ≥35 Years, 1991–1998

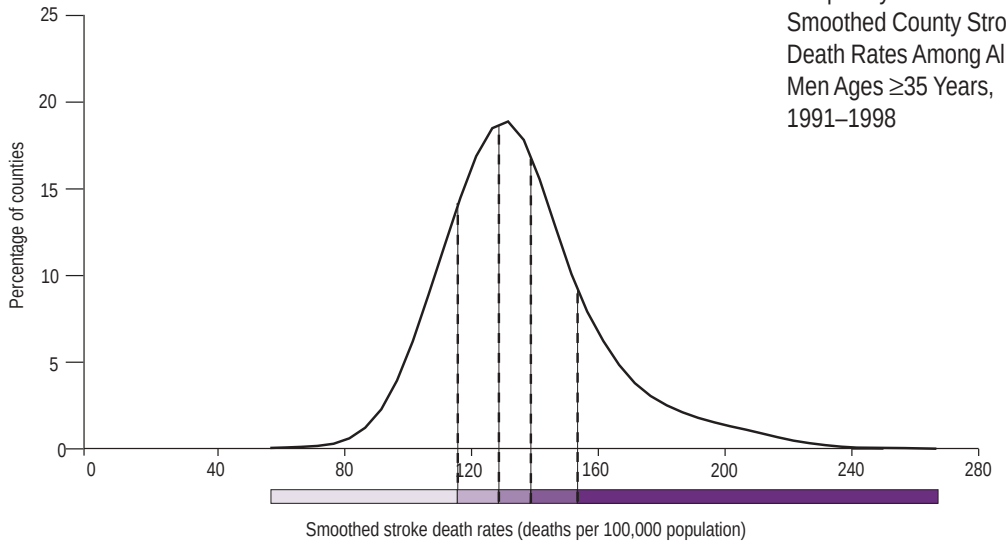


Figure 3.3
Frequency Distribution of Smoothed County Stroke Death Rates Among All Men Ages ≥35 Years, 1991–1998

The frequency distributions show the range of smoothed stroke death rates for women (Figure 3.2) and for men (Figure 3.3).

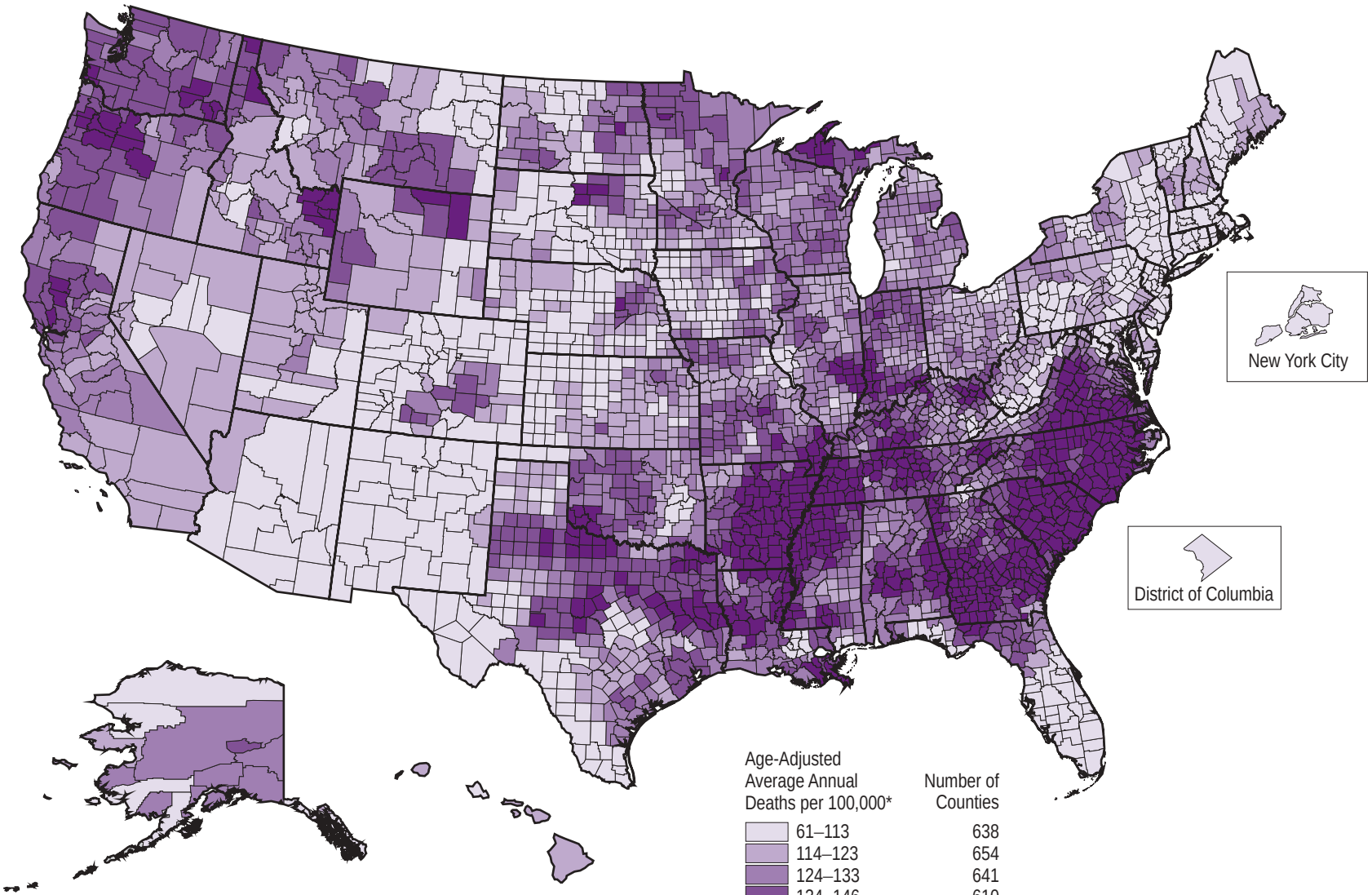
The maps indicate that for both women and men, a majority of the counties in the southeastern states (except Florida) were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia) and parts of the Mississippi Delta had dense concentrations of counties in the highest quintiles for women and men. Differences in the geographic patterns between women and men were observed in the midwestern and western states. For women, a pocket of counties with high rates extended from the western portion of Montana westward and southward through much of California. For men, a concentration of counties with high rates was observed in North Dakota, South Dakota, and other sections of the Midwest.

A Note on Methods

Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate the death rates and create the maps can be found in Appendix B.

Smoothed County Stroke Death Rates
1991–1998

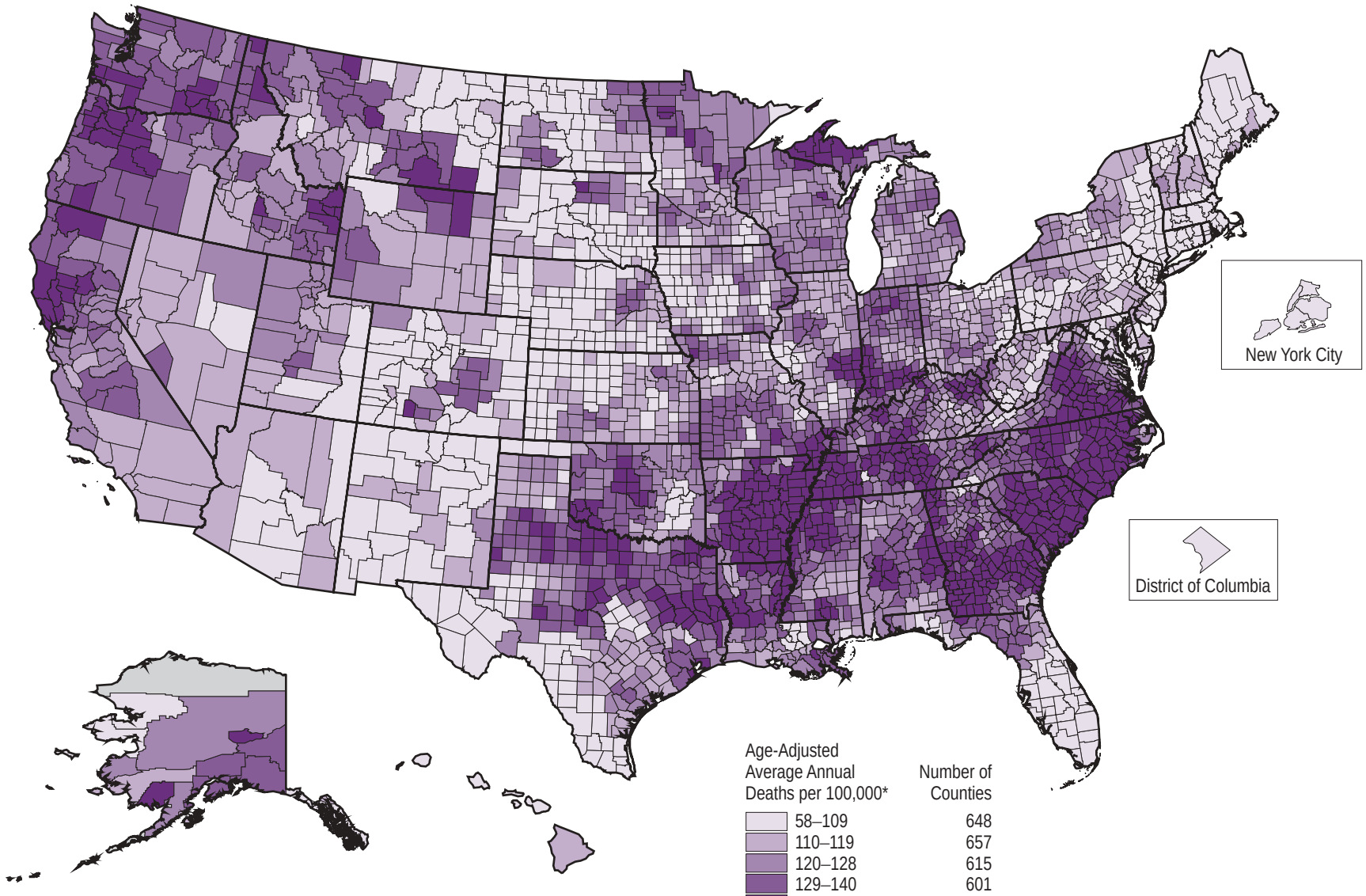
Total Population
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

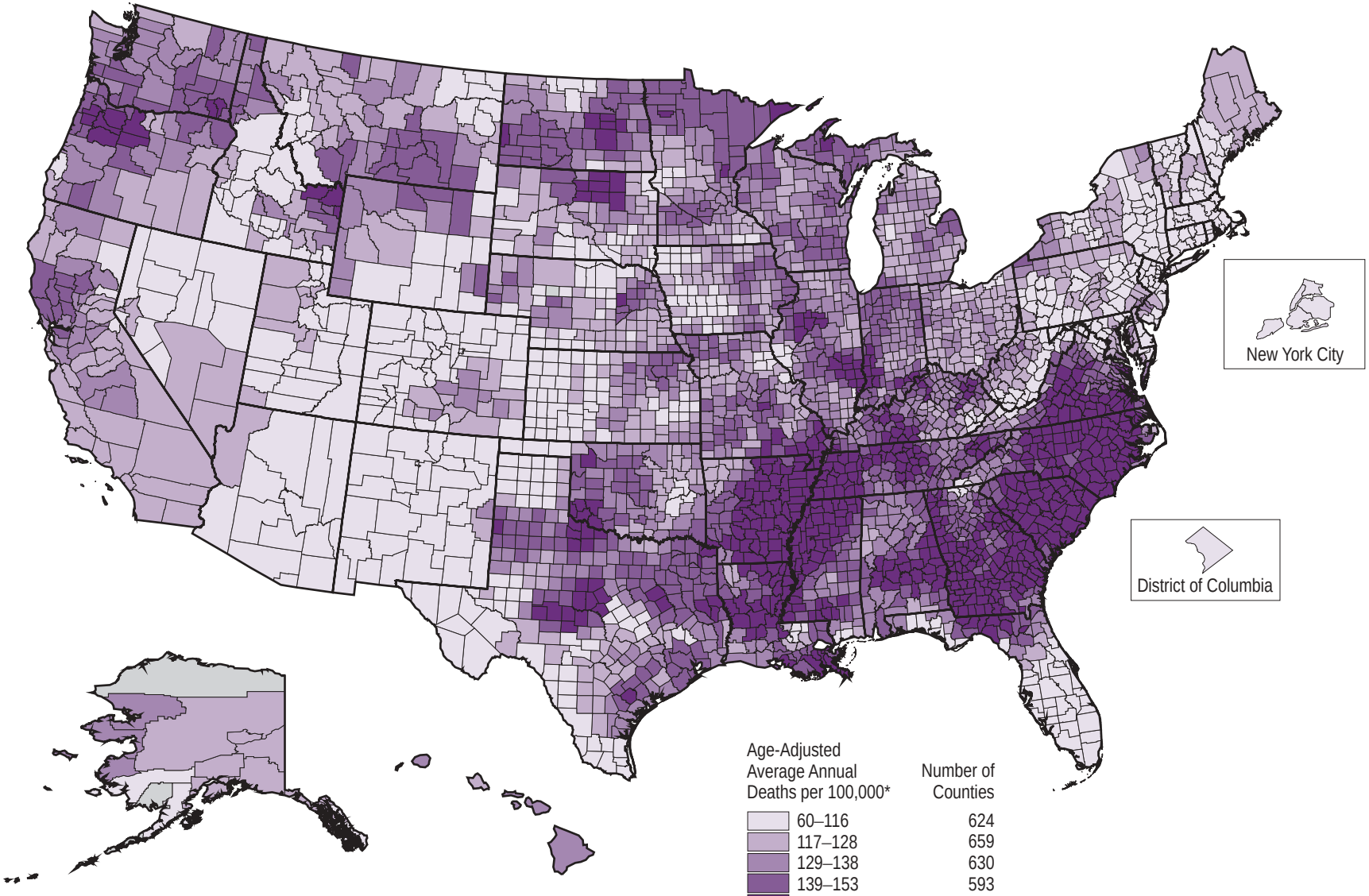
All Women
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

All Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

American Indians and Alaska Natives

American Indians and Alaska Natives made up 1.5% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for American Indians and Alaska Natives in this age group was 79/100,000. The American Indian and Alaska Native population in the United States is composed of many politically and culturally distinct Tribal Nations residing both in rural areas (including reservations with limited political sovereignty) and urban areas.

The national map of age-adjusted, spatially smoothed stroke death rates for all American Indians and Alaska Natives shows considerable geographic disparity across the 303 counties for which sufficient data existed to calculate rates. County death rates ranged from 29 to 272/100,000. A nearly fivefold difference existed between the midpoint of the highest quintile (222) and the midpoint of the lowest quintile (46). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for American Indians and Alaska Natives in all counties for which rates were calculated (Figure 3.4). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

The map suggests somewhat of a north-south gradient in stroke mortality among American Indians and Alaska Natives. Counties with high rates were reported primarily in the northern states of Alaska, Washington, Idaho, Montana, Wyoming, South Dakota, Wisconsin, and Minnesota. Counties with low rates were reported primarily in cental Oklahoma (predominantly among members of the Cherokee Nation), southern California, Arizona, and New Mexico. Exceptions to the north-south gradient were high rates in counties along the North Carolina–South Carolina border (where the Lumbee Indians reside), along the southern tip of Louisiana, and in Nevada.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 77/100,000 for American Indian and Alaska Native women and 80/100,000 for American Indian and Alaska Native men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for American Indian and Alaska Native women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For American Indian and Alaska Native women, county death rates ranged from 35 to 291/100,000. The range for American Indian and Alaska Native men was 33 to 291/100,000. For both women and men, a fivefold difference existed between the midpoint of the highest quintile (229 for women, 237 for men) and the midpoint of the lowest quintile (46 for women, 49 for men).

The frequency distributions show the range of smoothed stroke death rates for American Indian and Alaska Native

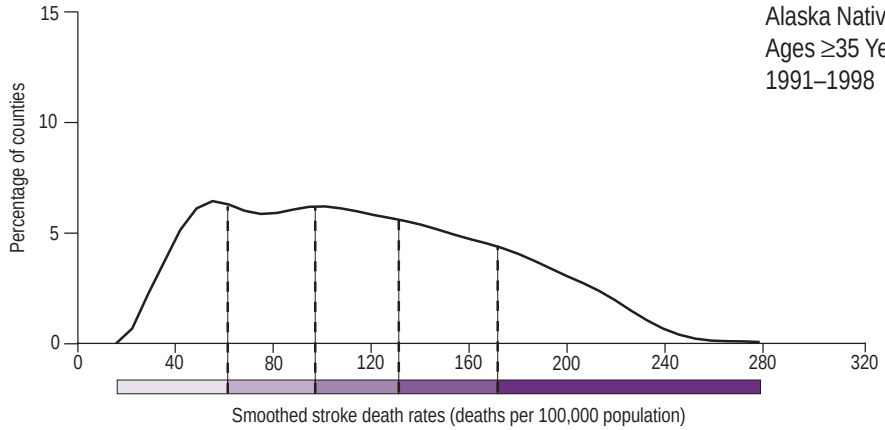


Figure 3.4
Frequency Distribution of Smoothed County Stroke Death Rates Among American Indians and Alaska Natives Ages ≥35 Years, 1991–1998

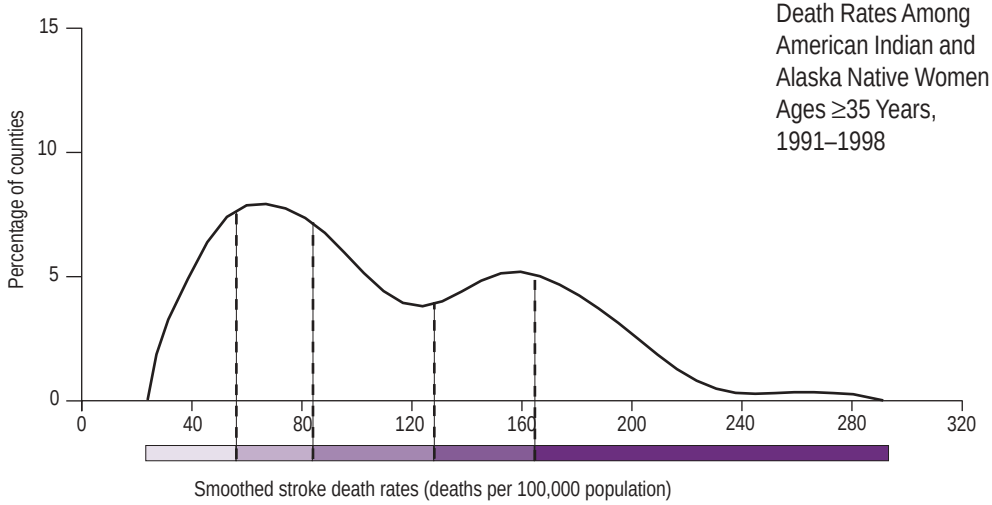


Figure 3.5
Frequency Distribution of Smoothed County Stroke Death Rates Among American Indian and Alaska Native Women Ages ≥35 Years, 1991–1998

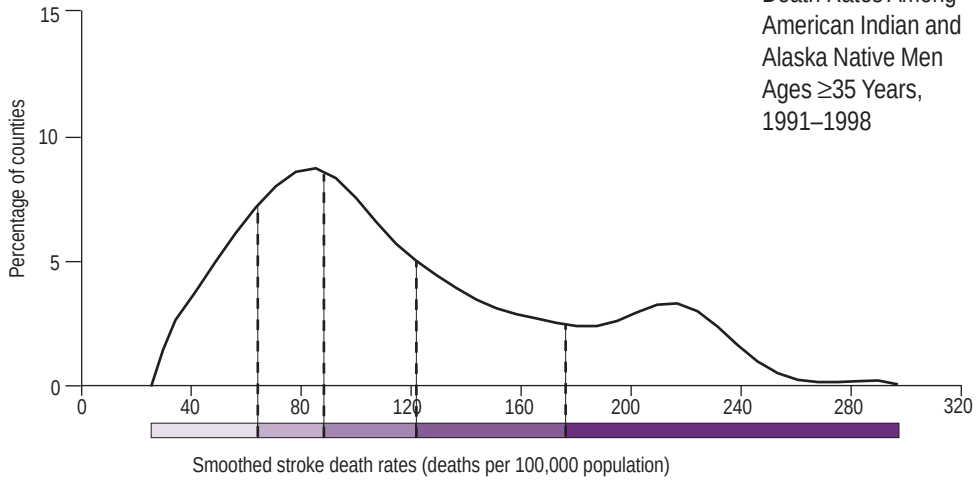


Figure 3.6
Frequency Distribution of Smoothed County Stroke Death Rates Among American Indian and Alaska Native Men Ages ≥35 Years, 1991–1998

women (Figure 3.5) and men (Figure 3.6) in all counties for which rates were calculated.

The maps for women and men indicate slightly different geographic patterns than the pattern for the total population. This difference can be largely attributed to the small number of counties with sufficient data to calculate rates for women and men separately. The patterns for American Indian and Alaska Native women and men are similar, with groups of counties with high rates in Oregon, northern California, and Arizona.

A Note on Methods

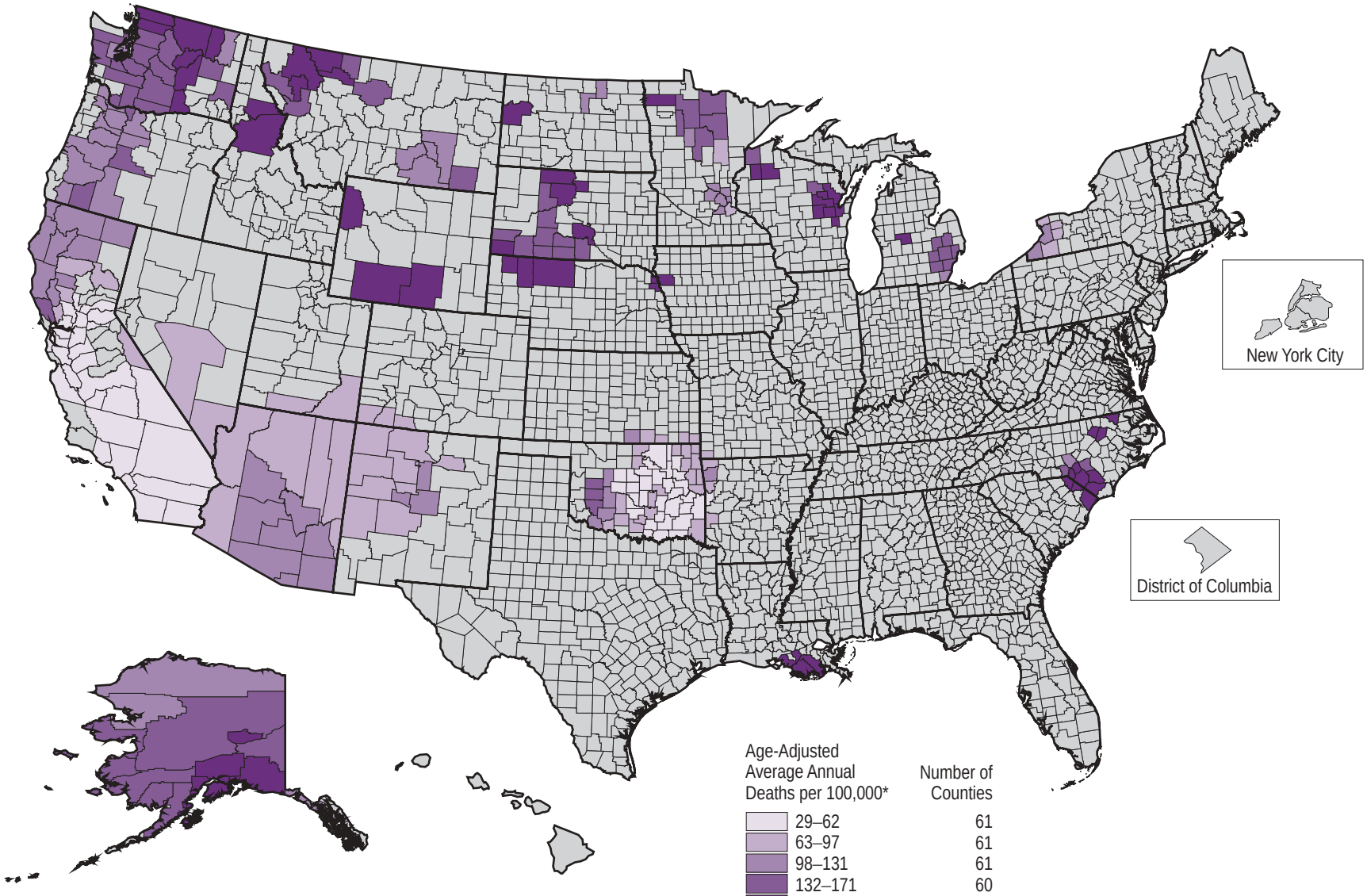
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate the death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that decedents of certain racial and ethnic minorities are sometimes misreported as "white" on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for American Indians and Alaska Natives. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of race and ethnicity on death certificates was a greater problem in certain parts of the country than others, the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates
1991–1998

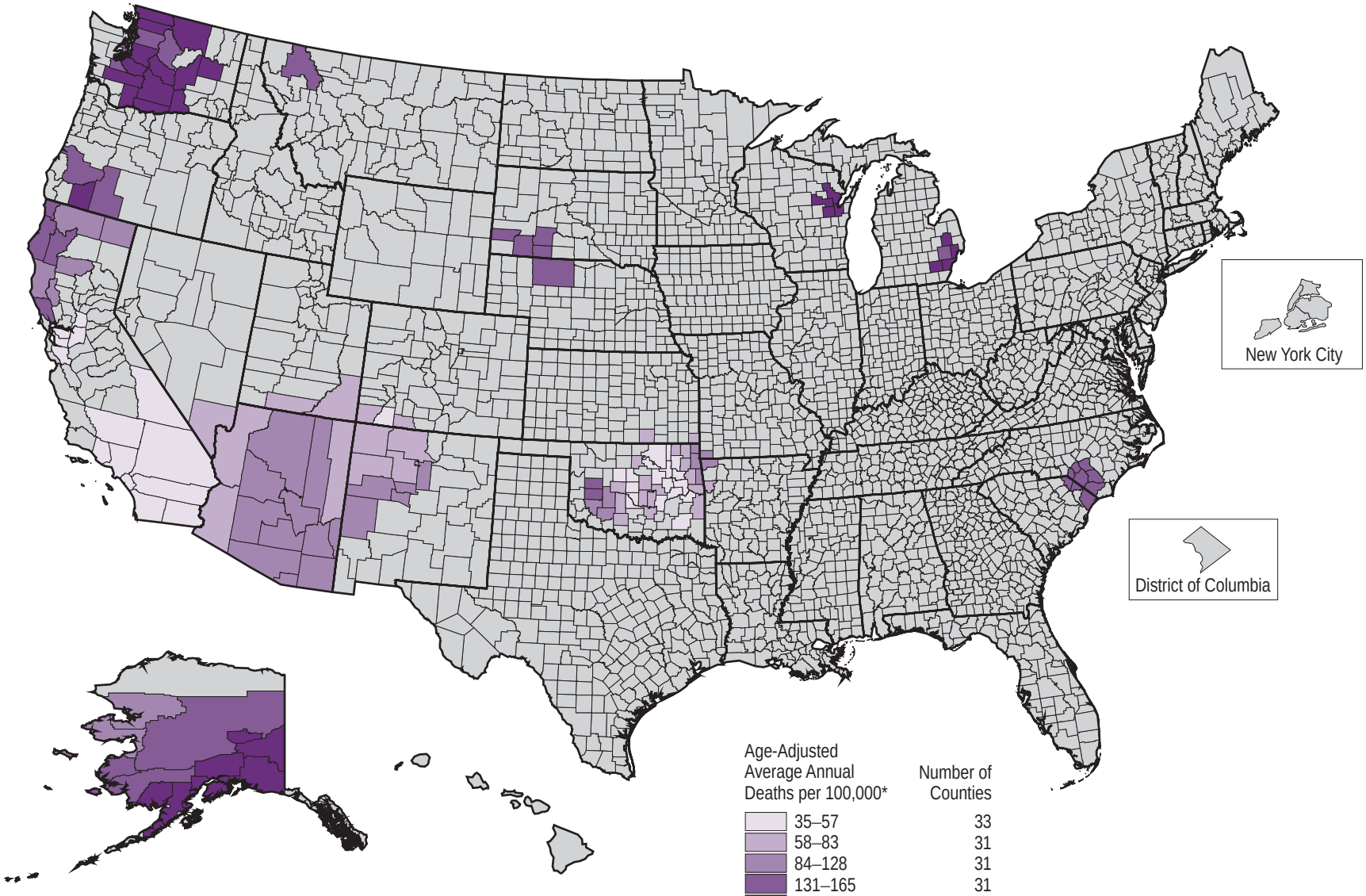
American Indians and Alaska Natives
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

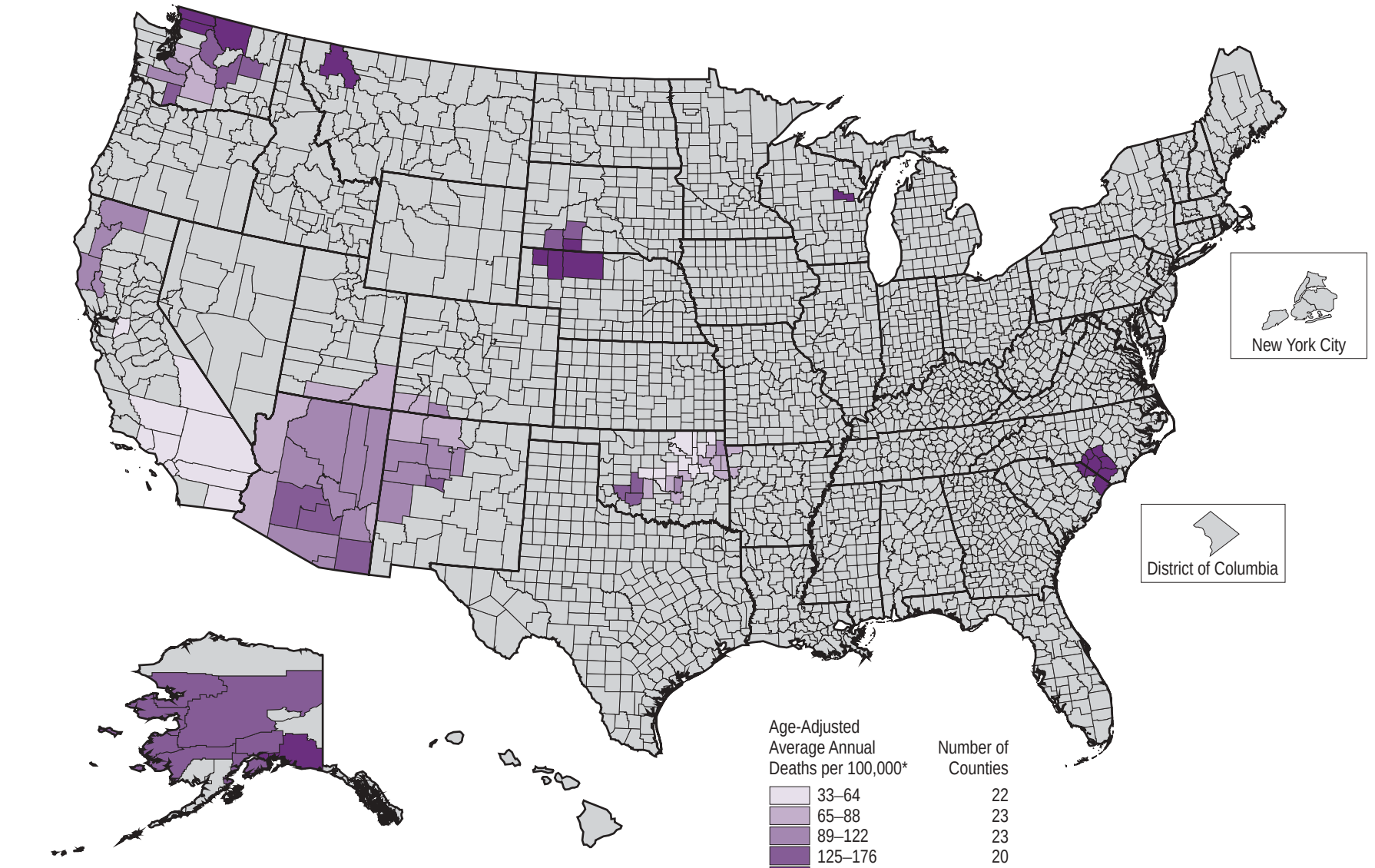
American Indian and Alaska Native Women
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

American Indian and Alaska Native Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Asians and Pacific Islanders

Asians and Pacific Islanders made up 4.5% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for Asians and Pacific Islanders in this age group was 105/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all Asians and Pacific Islanders shows considerable geographic disparity across the 364 counties for which sufficient data existed to calculate rates. County death rates ranged from 43 to 184/100,000. A nearly threefold difference existed between the midpoint of the highest quintile (156) and the midpoint of the lowest quintile (56). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for Asians and Pacific Islanders in all counties for which rates were calculated (Figure 3.7). The vertical dotted lines and graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

The map indicates a west-east gradient of stroke mortality among Asians and Pacific Islanders. Counties with the highest rates were reported in sections of Washington, Oregon, California, Nevada, and Arizona, with pockets of counties with high rates in the metropolitan areas of Minneapolis/St. Paul, Minnesota, and Memphis, Tennessee. Counties with the lowest rates were reported in the metropolitan areas of New York City, Philadelphia, Chicago, Miami and other parts of southern and middle Florida, and New Jersey.

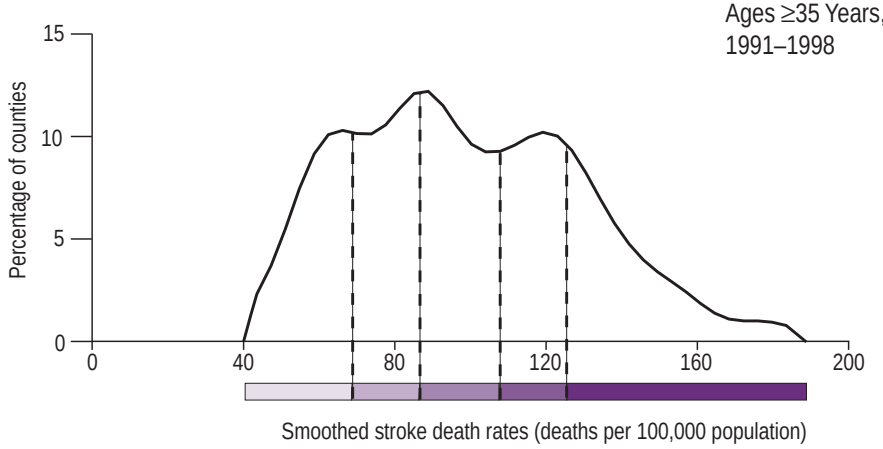
Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 96/100,000 for Asian and Pacific Islander women and 118/100,000 for Asian and Pacific Islander men ages 35 and older.

The maps of age-adjusted, spatially smoothed stroke death rates for Asian and Pacific Islander women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For Asian and Pacific Islander women, county death rates ranged from 33 to 237/100,000. The range for Asian and Pacific Islander men was 40 to 209/100,000. For both women and men, an approximately threefold difference existed between the midpoint of the highest quintile (178 for women, 176 for men) and the midpoint of the lowest quintile (54 for women, 61 for men).

The frequency distributions show the range of smoothed stroke death rates for Asian and Pacific Islander women

Figure 3.7
Frequency Distribution of Smoothed County Stroke Death Rates Among Asians and Pacific Islanders Ages ≥35 Years, 1991–1998



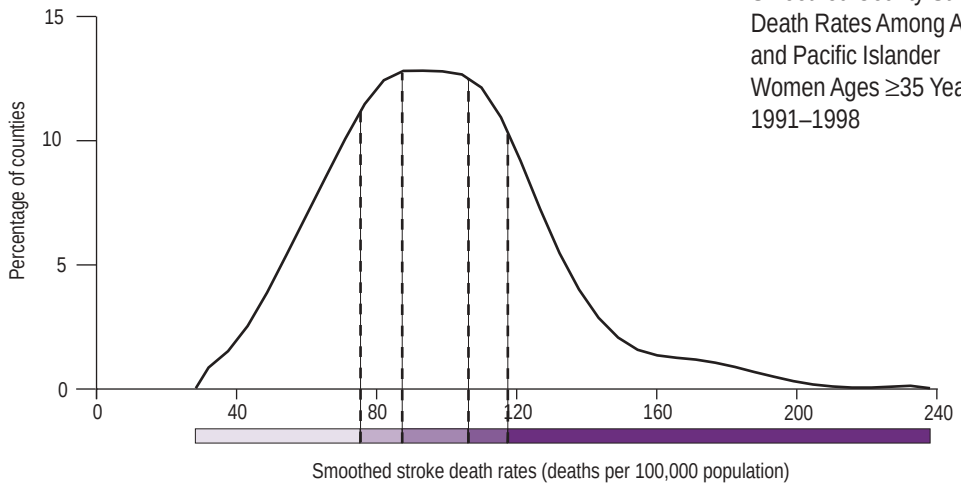


Figure 3.8
Frequency Distribution of Smoothed County Stroke Death Rates Among Asian and Pacific Islander Women Ages ≥35 Years, 1991–1998

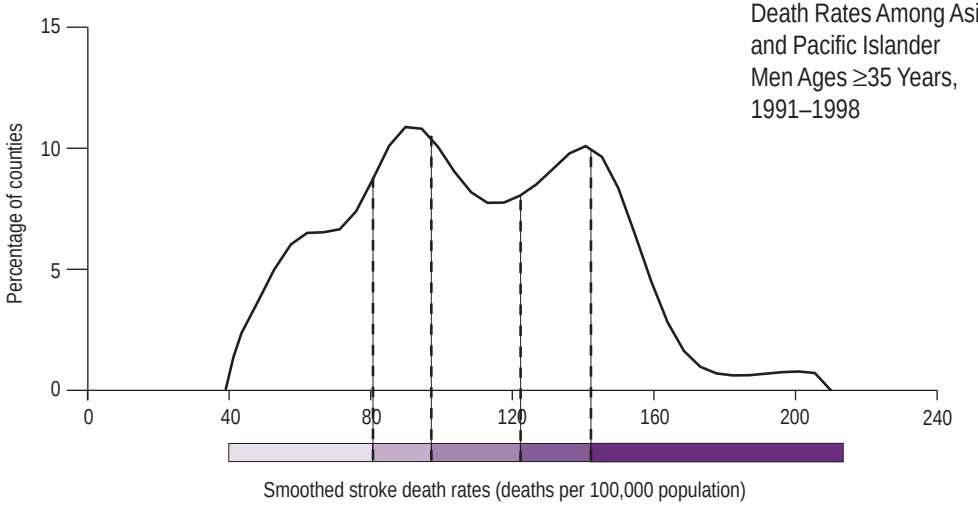


Figure 3.9
Frequency Distribution of Smoothed County Stroke Death Rates Among Asian and Pacific Islander Men Ages ≥35 Years, 1991–1998

(Figure 3.8) and men (Figure 3.9) in all counties for which rates were calculated.

The maps indicate a west-east gradient of stroke mortality for both Asian and Pacific Islander women and men. Counties with the highest rates were reported primarily in sections of Washington, Oregon, California, Nevada, Utah, and Arizona, with pockets of counties with high rates in the metropolitan areas of Minneapolis/St. Paul, Minnesota, and Dallas, Texas.

A Note on Methods

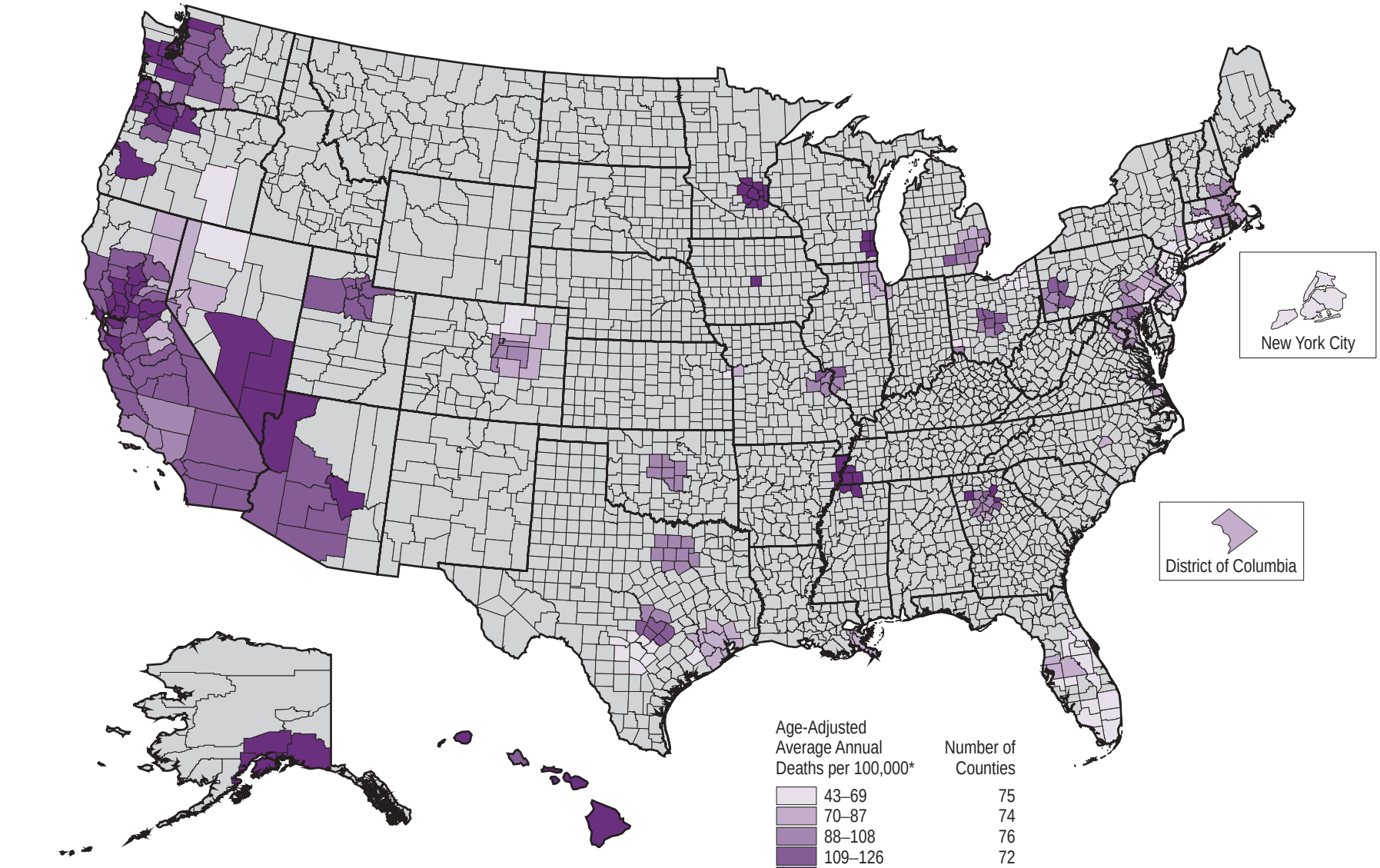
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that decedents of certain racial and ethnic minorities are sometimes misreported as "white" on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for Asians and Pacific Islanders. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of race and ethnicity on death certificates was a greater problem in certain parts of the country than others, the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates
1991–1998

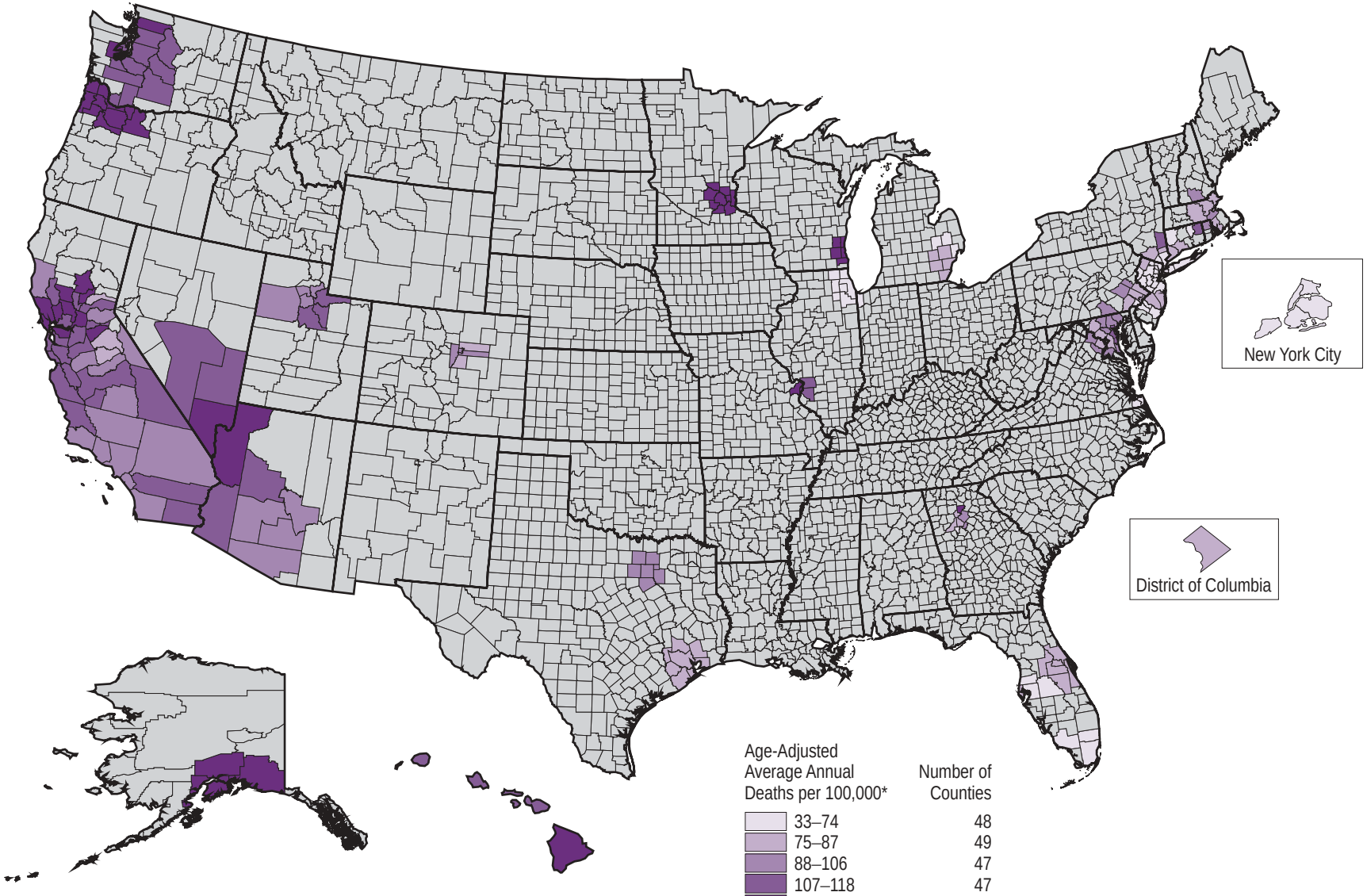
Asians and Pacific Islanders
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates 1991–1998

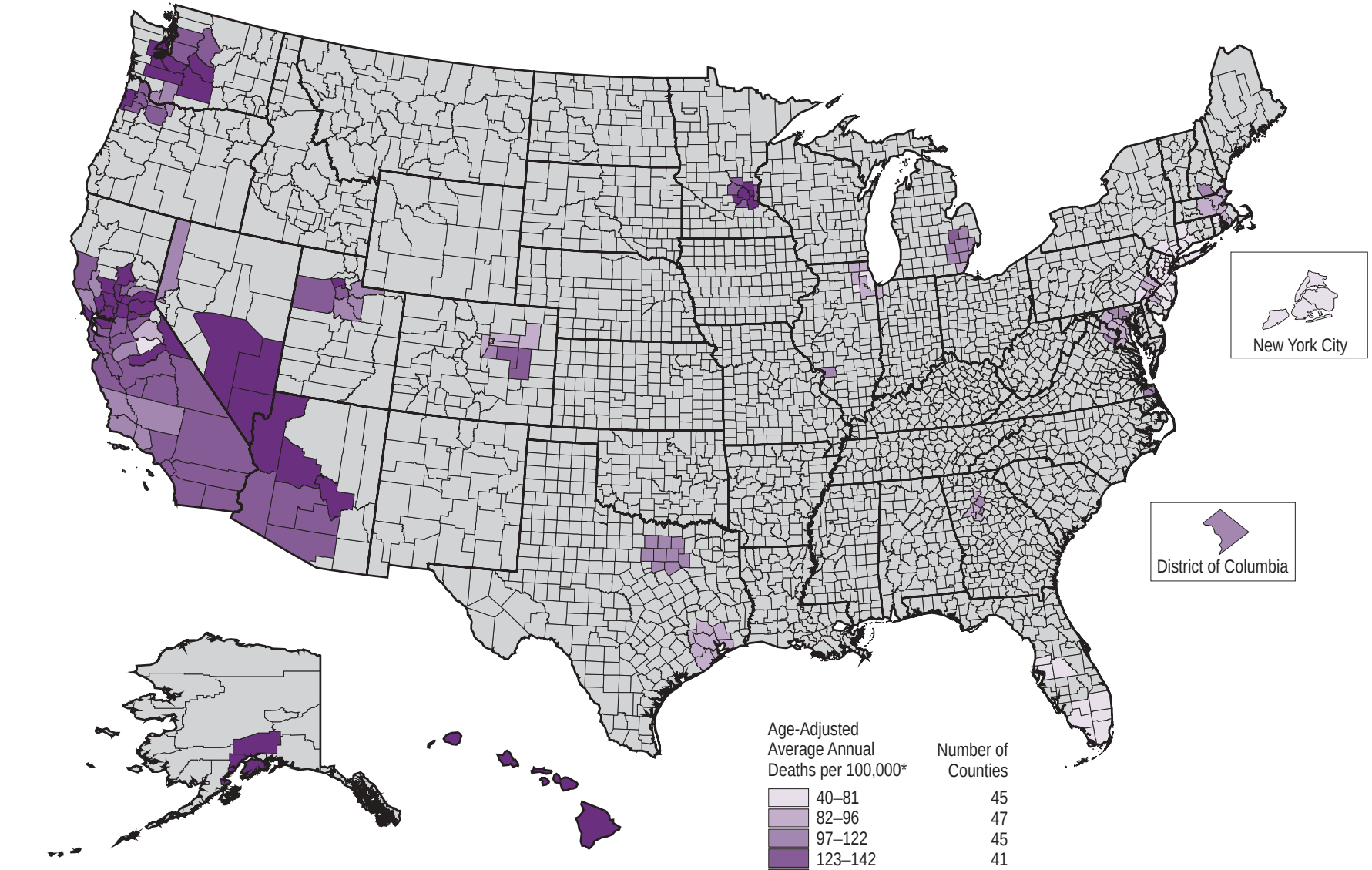
Asian and Pacific Islander Women Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

Asian and Pacific Islander Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Blacks

Blacks were the largest racial and ethnic minority group among U.S. residents ages 35 years and older in 2000, making up 12.9% of all residents. During 1991–1998, the age-adjusted stroke death rate for blacks in this age group was 166/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all blacks shows considerable geographic disparity across the 1,872 counties for which sufficient data existed to calculate rates. County death rates ranged from 74 to 311/100,000. A greater than twofold difference existed between the midpoint of the highest quintile (261) and the midpoint of the lowest quintile (111). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for blacks (Figure 3.10). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

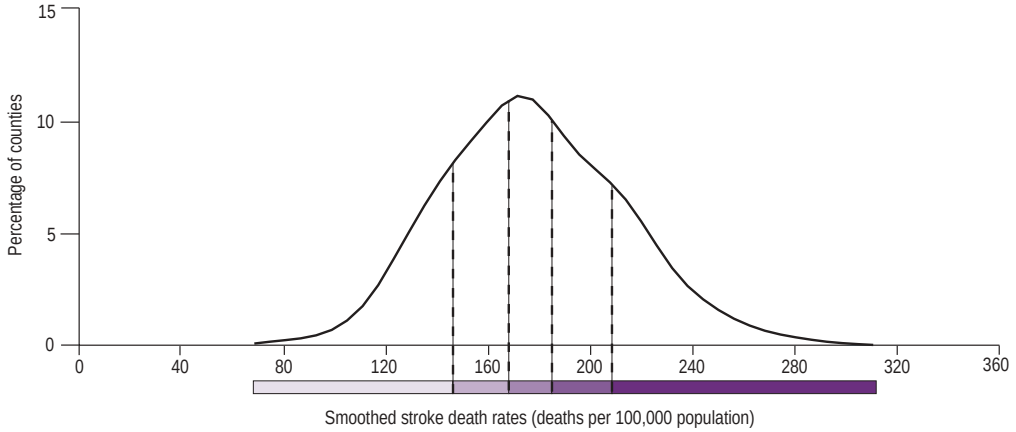
According to the map, the highest stroke death rates for blacks were reported in counties located primarily in two regions of the Southeast. The first region includes nearly the entire state of South Carolina, much of North Carolina, and many of the southern, rural Georgia counties of the Cotton Belt. The second region is the Mississippi River Valley and Delta, specifically counties in Arkansas, western Mississippi, and western Tennessee. Smaller groupings of counties in the highest quintile were also observed in northeastern Texas, northwestern Illinois, and along the Washington–Idaho border. Counties with low rates were reported primarily in the southwestern states of Nevada, Arizona, and New Mexico, along with parts of the Northeast. Several metropolitan areas had stroke death rates in the lowest quintile, including Boston, the District of Columbia, New York City, and Philadelphia.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 153/100,000 for black women and 182/100,000 for black men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for black women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For black women, county death rates ranged from 70 to 302/100,000. The range for black men was 84 to 404/100,000. For both women and men, a greater than twofold difference existed between the midpoint of the highest quintile (249 for women, 322 for men) and the midpoint of the lowest quintile (105 for women, 124 for men).

Figure 3.10
Frequency Distribution of Smoothed County Stroke Death Rates Among Blacks Ages ≥35 Years, 1991–1998



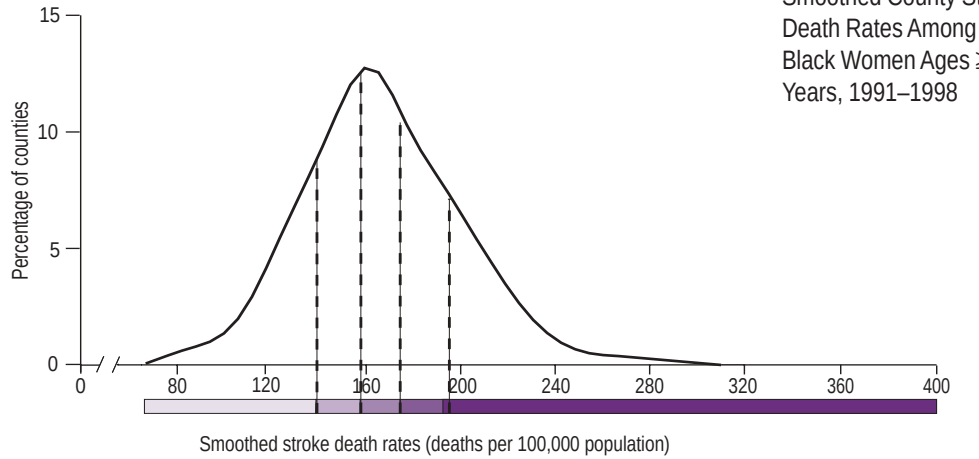


Figure 3.11
Frequency Distribution of Smoothed County Stroke Death Rates Among Black Women Ages ≥35 Years, 1991–1998

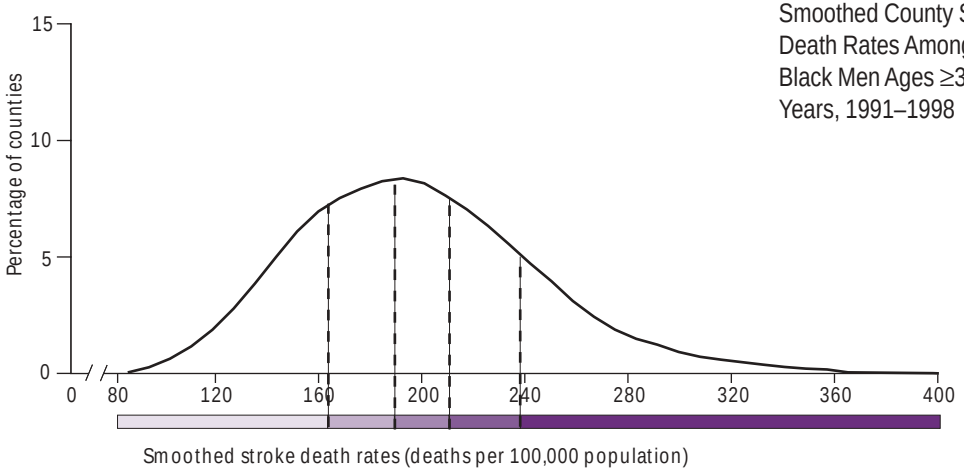


Figure 3.12
Frequency Distribution of Smoothed County Stroke Death Rates Among Black Men Ages ≥35 Years, 1991–1998

The frequency distributions show the range of smoothed stroke death rates for black women (Figure 3.11) and men (Figure 3.12) in all counties for which rates were calculated.

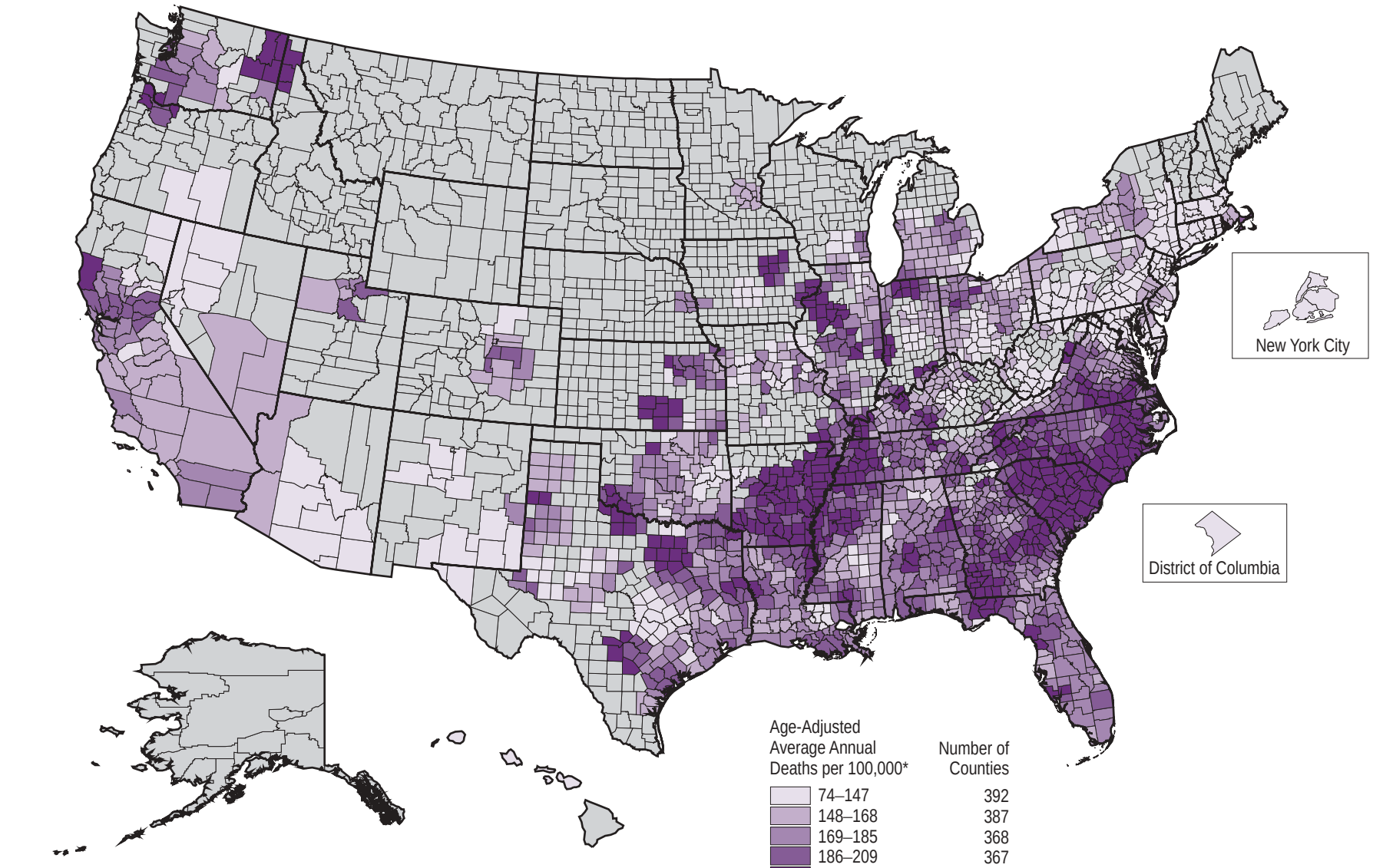
The maps indicate that for both black women and men, a majority of the counties in the southeastern states were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, Georgia, and Florida) and parts of the Mississippi Delta (as far east as Alabama) had dense concentrations of counties in the highest quintiles for women and men. Differences in the geographic patterns between women and men were observed in the western states. California, Arizona, Nevada, and Washington showed more counties in the top two quintiles for black women than for black men.

A Note on Methods

Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

Smoothed County Stroke Death Rates
1991–1998

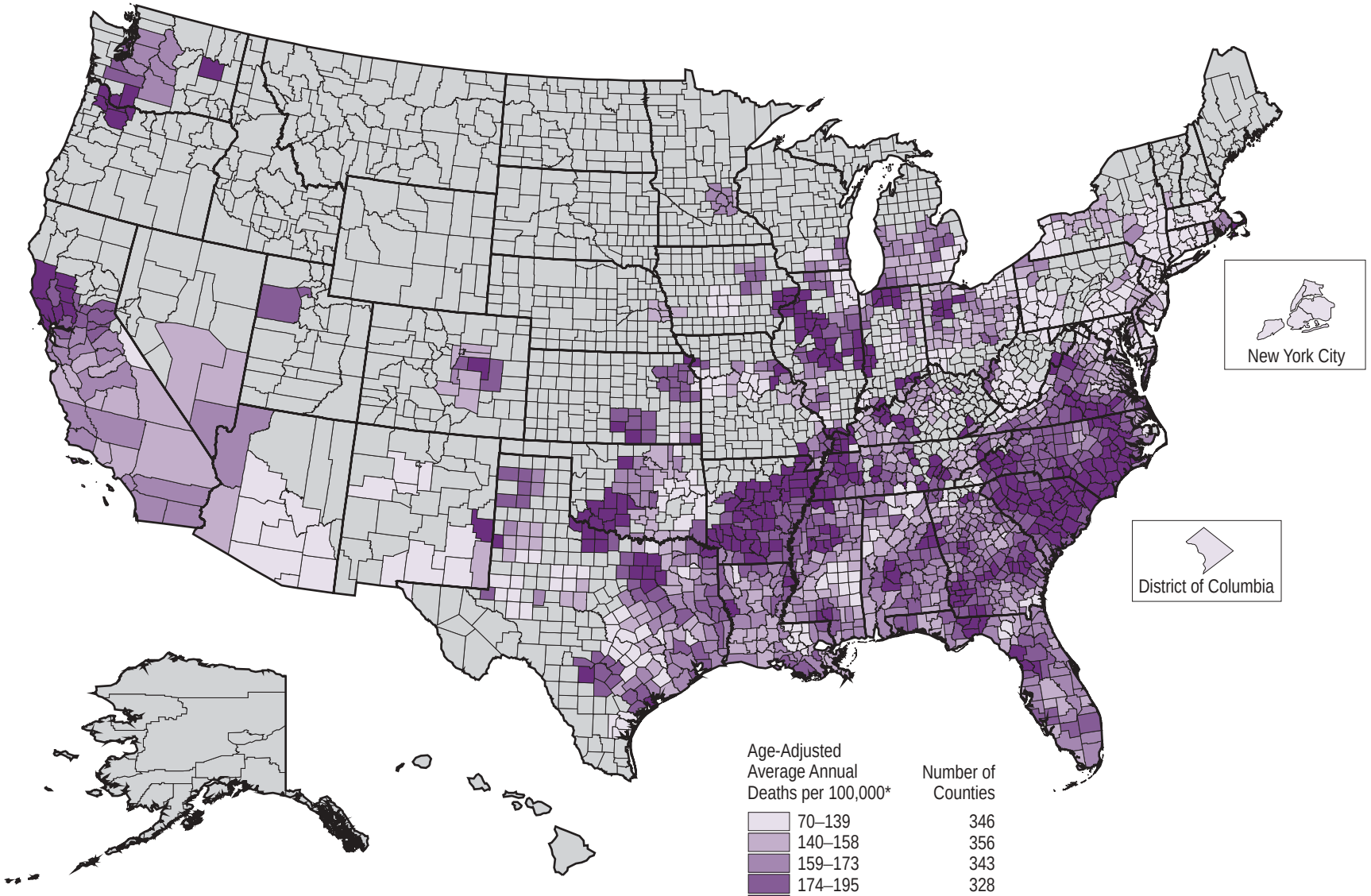
Blacks
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

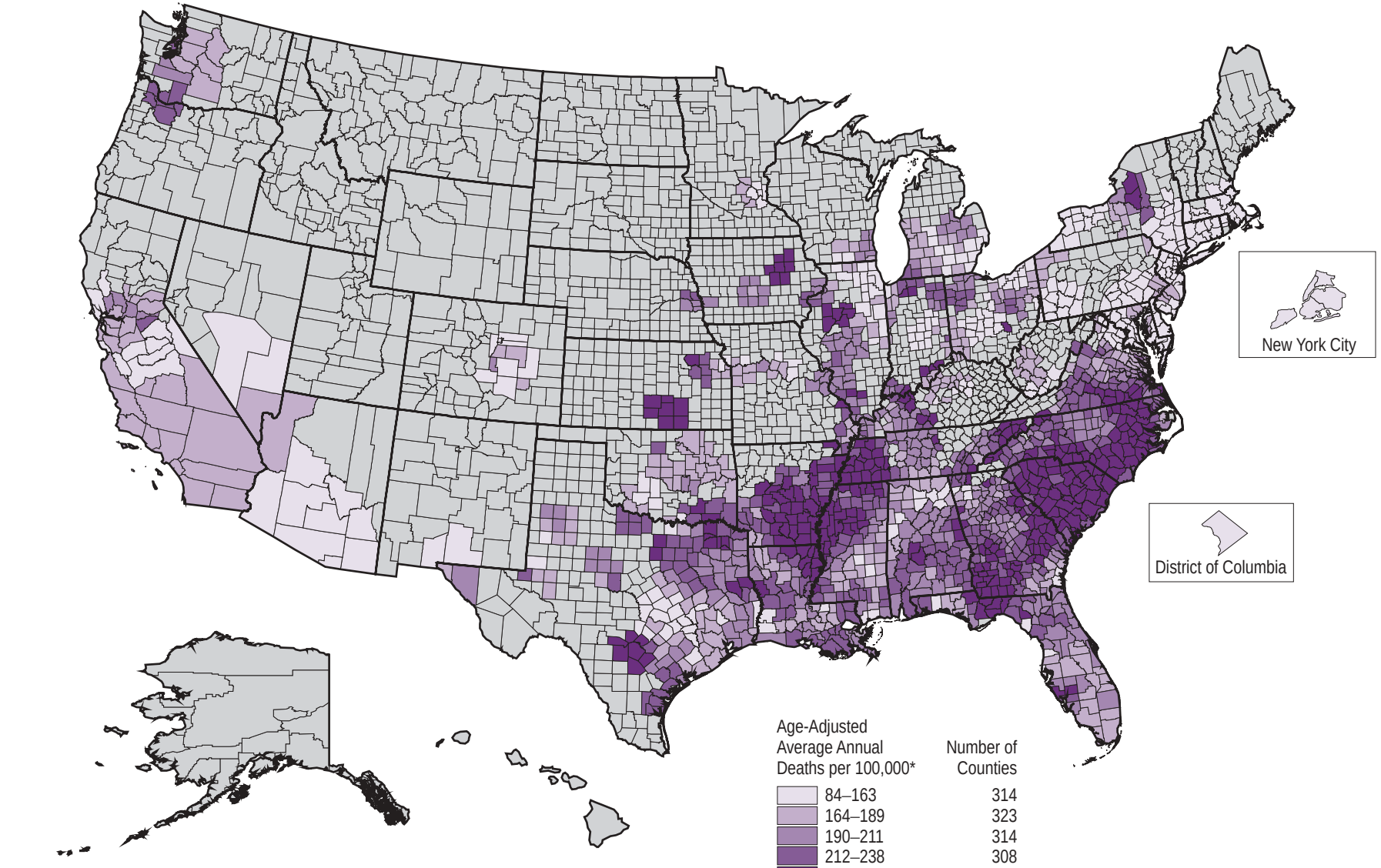
Black Women
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

Black Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Hispanics

Hispanics were the second largest racial and ethnic minority group among U.S. residents ages 35 years and older in 2000, making up 12.5% of all residents. During 1991–1998, the age-adjusted stroke death rate for Hispanics in this age group was 79/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all Hispanics shows considerable geographic disparity across the 724 counties for which sufficient data existed to calculate rates. County death rates ranged from 20 to 239/100,000. An approximately fourfold difference existed between the midpoint of the highest quintile (173) and the midpoint of the lowest quintile (41). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for Hispanics in all counties for which rates were calculated (Figure 3.13). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

According to the map, the highest stroke death rates for Hispanics were reported primarily in an area that extends from central New Mexico southeast into northwestern and central Texas, with an additional concentration among counties in and around Corpus Christi. Smaller groupings of counties in the highest quintile were also observed in eastern Texas, south-central Colorado, and northern Washington. The majority of counties in the highest three quintiles are located in the southwestern and Pacific states. Although several counties with low rates were reported in northern California and Nevada, most of the lowest rates were observed in the Northeast, southern Florida, and Chicago, Illinois.

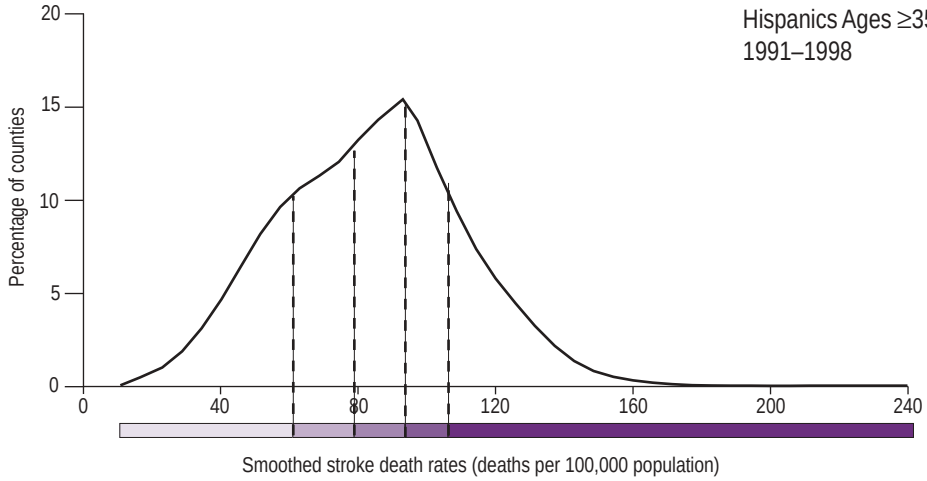
Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 72/100,000 for Hispanic women and 88/100,000 for Hispanic men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for Hispanic women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For Hispanic women, county death rates ranged from 22 to 156/100,000. The range for Hispanic men was 35 to 194/100,000. For both women and men, an approximately threefold difference existed between the midpoint of the highest quintile (128 for women, 159 for men) and the midpoint of the lowest quintile (39 for women, 55 for men).

The frequency distributions show the range of smoothed stroke death rates for Hispanic women (Figure 3.14) and

Figure 3.13
Frequency Distribution of Smoothed County Stroke Death Rates Among Hispanics Ages ≥35 Years, 1991–1998



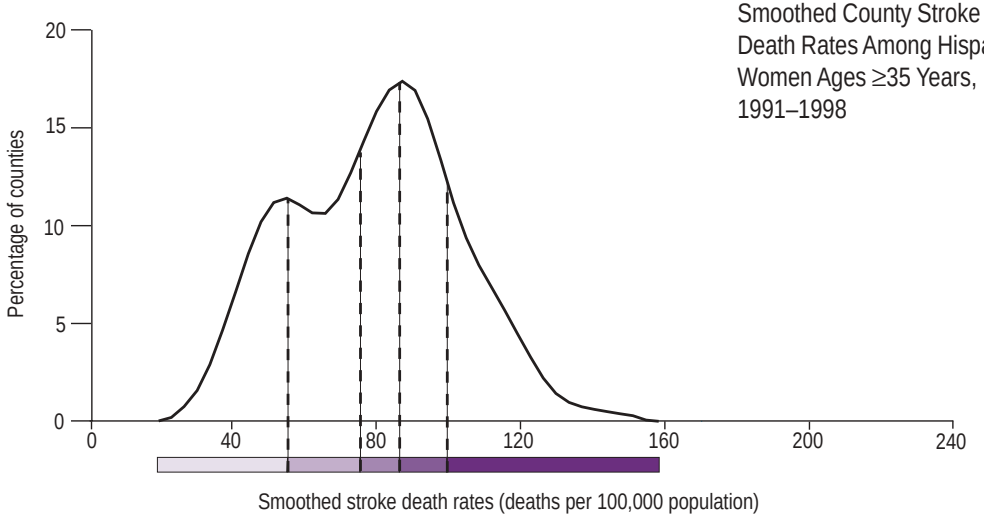


Figure 3.14
Frequency Distribution of Smoothed County Stroke Death Rates Among Hispanic Women Ages ≥35 Years, 1991–1998

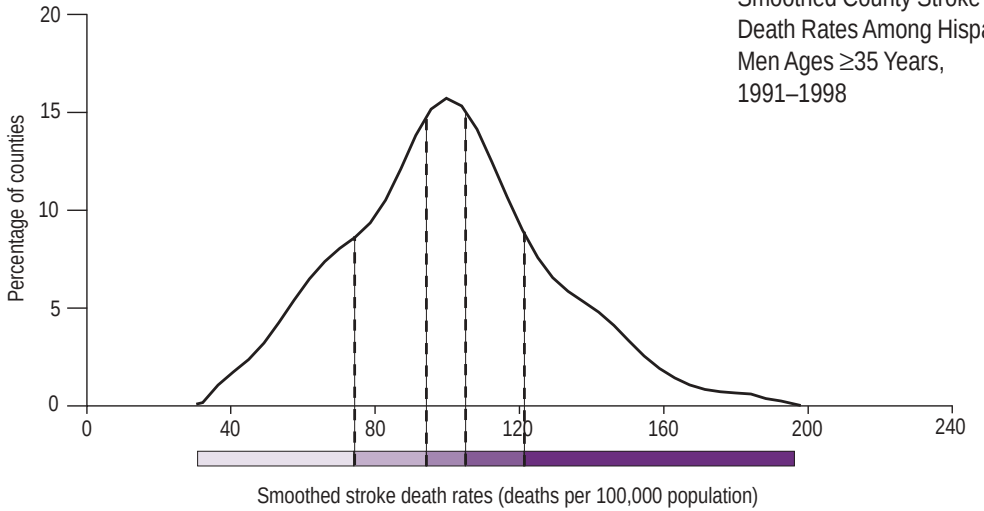


Figure 3.15
Frequency Distribution of Smoothed County Stroke Death Rates Among Hispanic Men Ages ≥35 Years, 1991–1998

men (Figure 3.15) in all counties for which rates were calculated.

The maps indicate that the largest concentrations of counties with the highest rates for both Hispanic women and men were reported in the southwestern states and California. New Mexico and California had larger concentrations of counties in the highest quintile for women compared with men, whereas Washington had a larger concentration of counties with high rates for men.

A Note on Methods

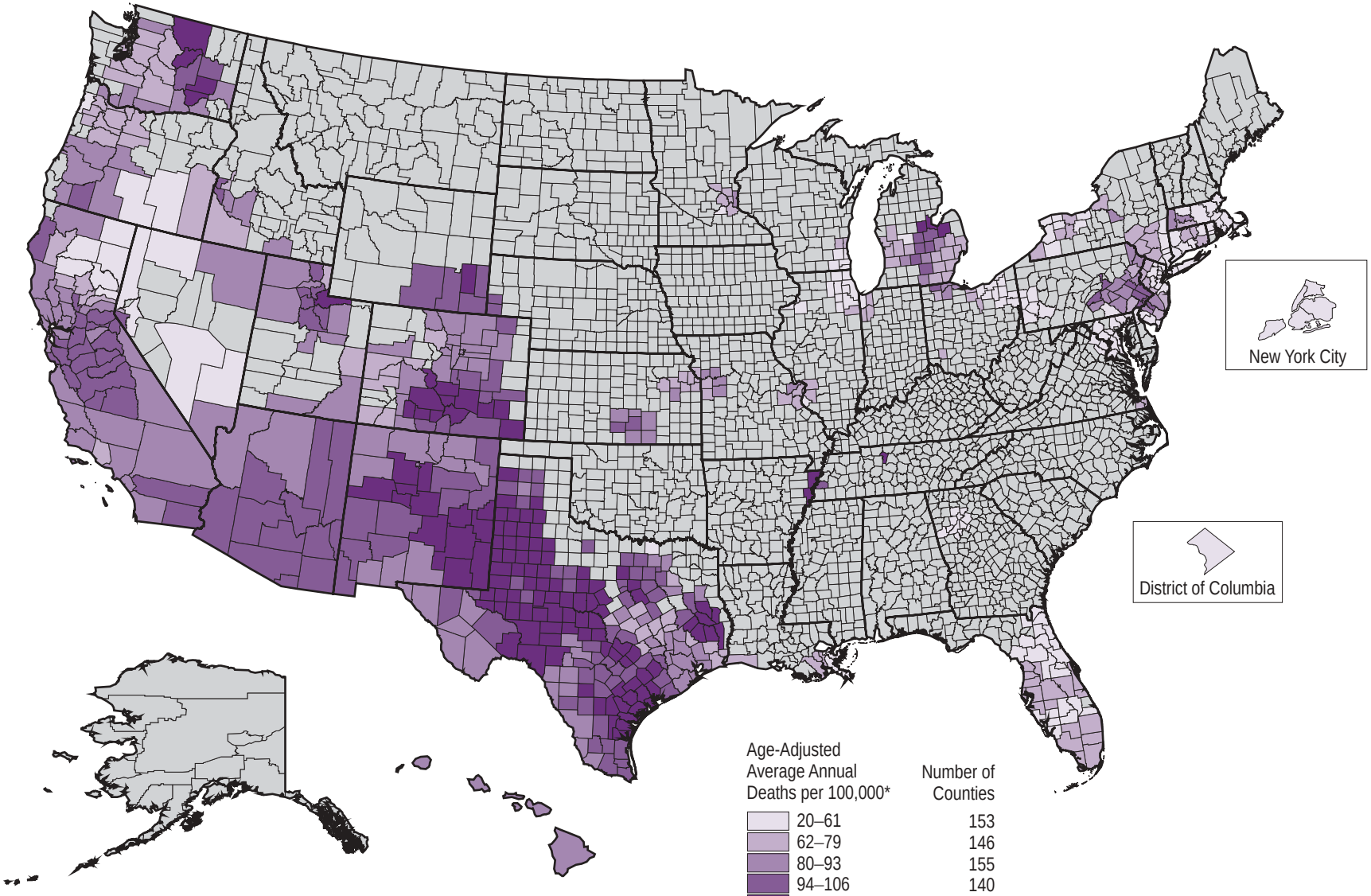
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that Hispanic decedents are sometimes misreported as non-Hispanic on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for Hispanics. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of Hispanic origin on death certificates was a greater problem in certain parts of the country, then the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates
1991–1998

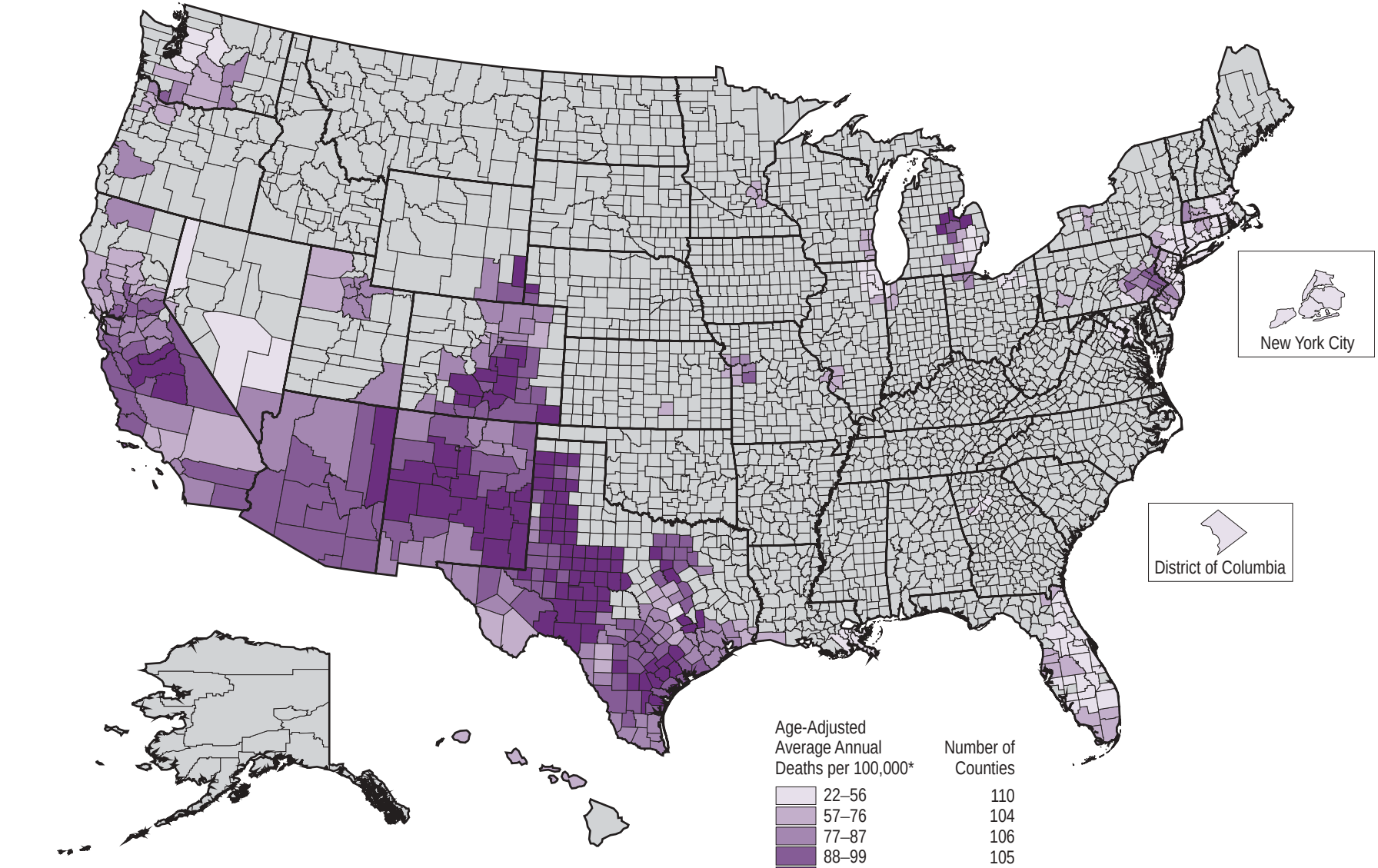
Hispanics
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

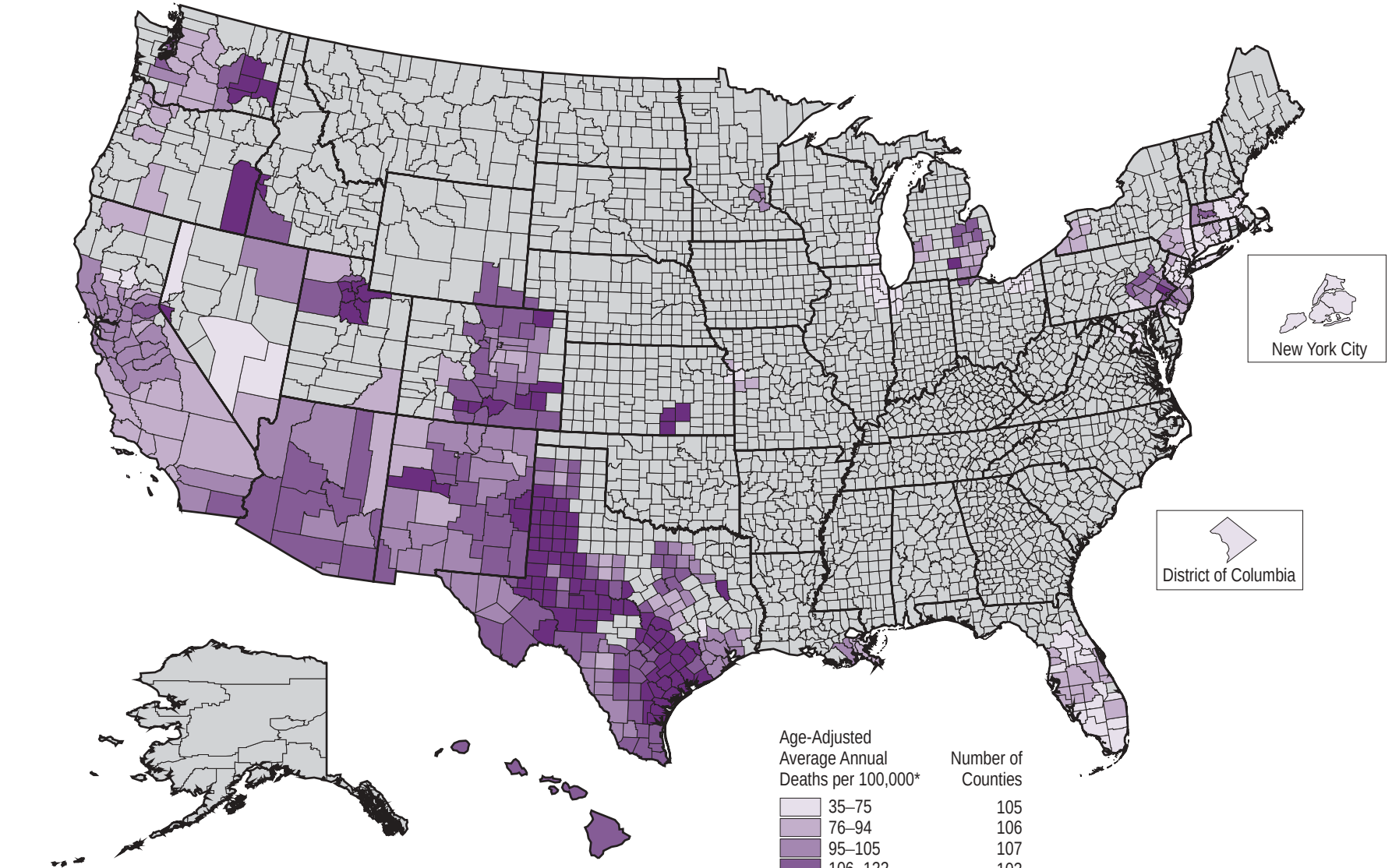
Hispanic Women
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

Hispanic Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Whites

Whites made up 77.1% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for whites in this age group was 117/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all whites shows considerable geographic disparity across the 3,095 counties for which sufficient data existed to calculate rates. County death rates ranged from 53 to 231/100,000. An approximately twofold difference existed between the midpoint of the highest quintile (187) and the midpoint of the lowest quintile (83). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke rates for whites (Figure 3.16). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

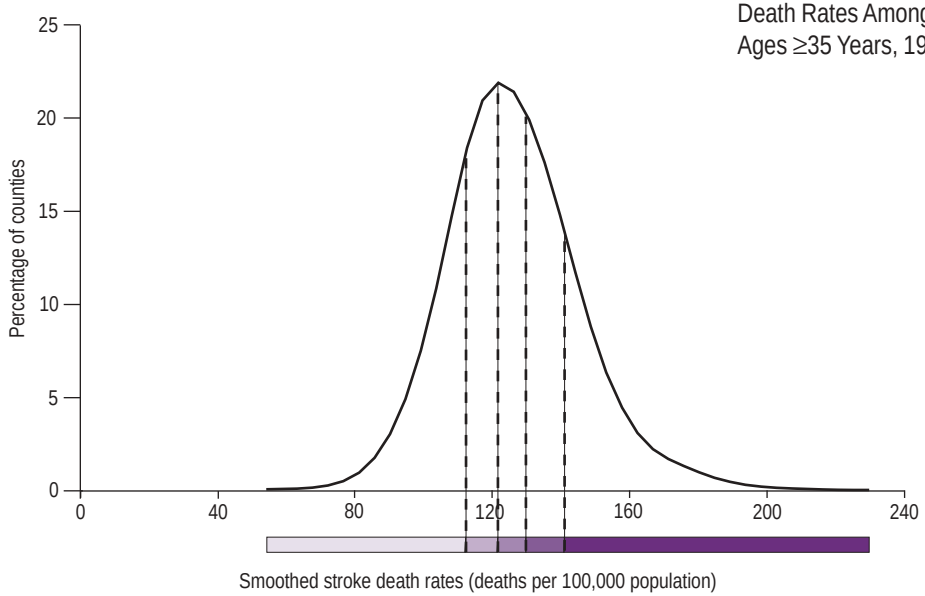
According to the map, the highest stroke death rates for whites were reported in counties concentrated primarily in two areas of the Southeast. The first area encompasses the Piedmont and coastal counties of South Carolina and North Carolina, much of Virginia, and many of the southern, rural Georgia counties of the Cotton Belt. The second area is the Mississippi Delta, including nearly all of Arkansas, northwestern counties of Mississippi, much of Tennessee, and parts of Kentucky. Other groupings of counties in the highest quintile were reported in northern Michigan, northwestern Oregon, and parts of central Texas and around San Francisco. Counties in the lowest quintile were reported primarily in the Northeast, southern Florida, and parts of the Great Plains and Southwest. Alaska and Hawaii also had counties in the lower quintiles.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 113/100,000 for white women and 121/100,000 for white men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for white women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For white women, county death rates ranged from 51 to 229/100,000. The range for white men was 42 to 229/100,000. For both women and men, an approximately twofold difference existed between the midpoint of the highest quintile (184 for women, 189 for men) and the midpoint of the lowest quintile (79 for women, 79 for men).

Figure 3.16
Frequency Distribution of Smoothed County Stroke Death Rates Among Whites Ages ≥35 Years, 1991–1998



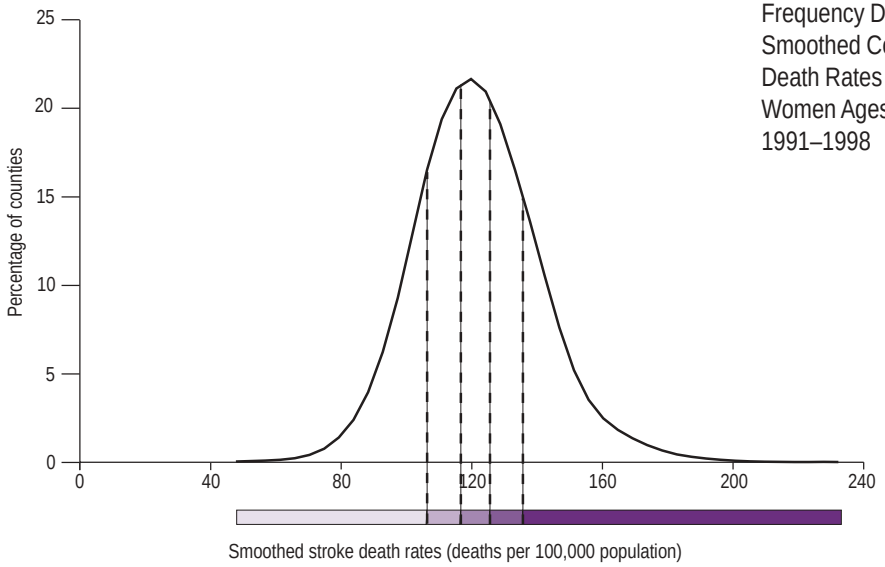


Figure 3.17
Frequency Distribution of Smoothed County Stroke Death Rates Among White Women Ages ≥35 Years, 1991–1998

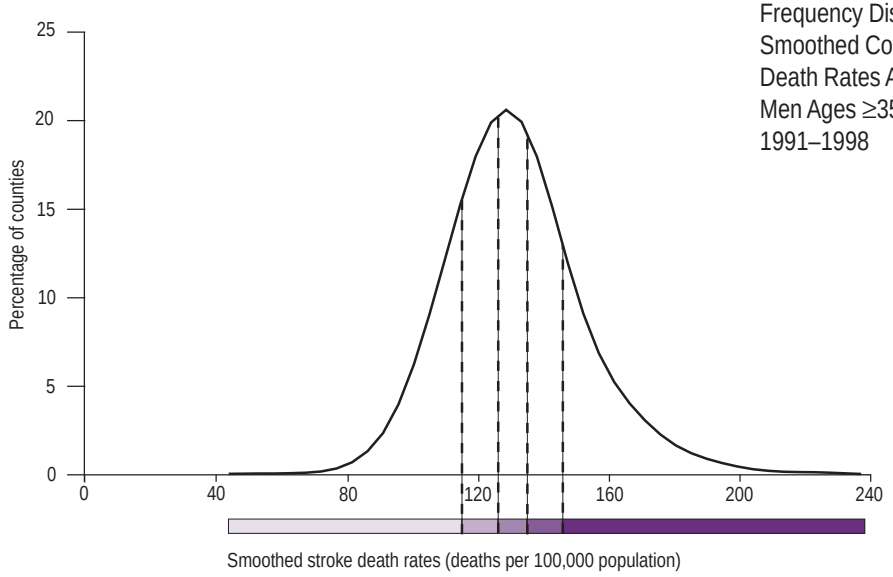


Figure 3.18
Frequency Distribution of Smoothed County Stroke Death Rates Among White Men Ages ≥35 Years, 1991–1998

The frequency distributions show the range of smoothed stroke death rates for white women (Figure 3.17) and men (Figure 3.18) in all counties for which rates were calculated.

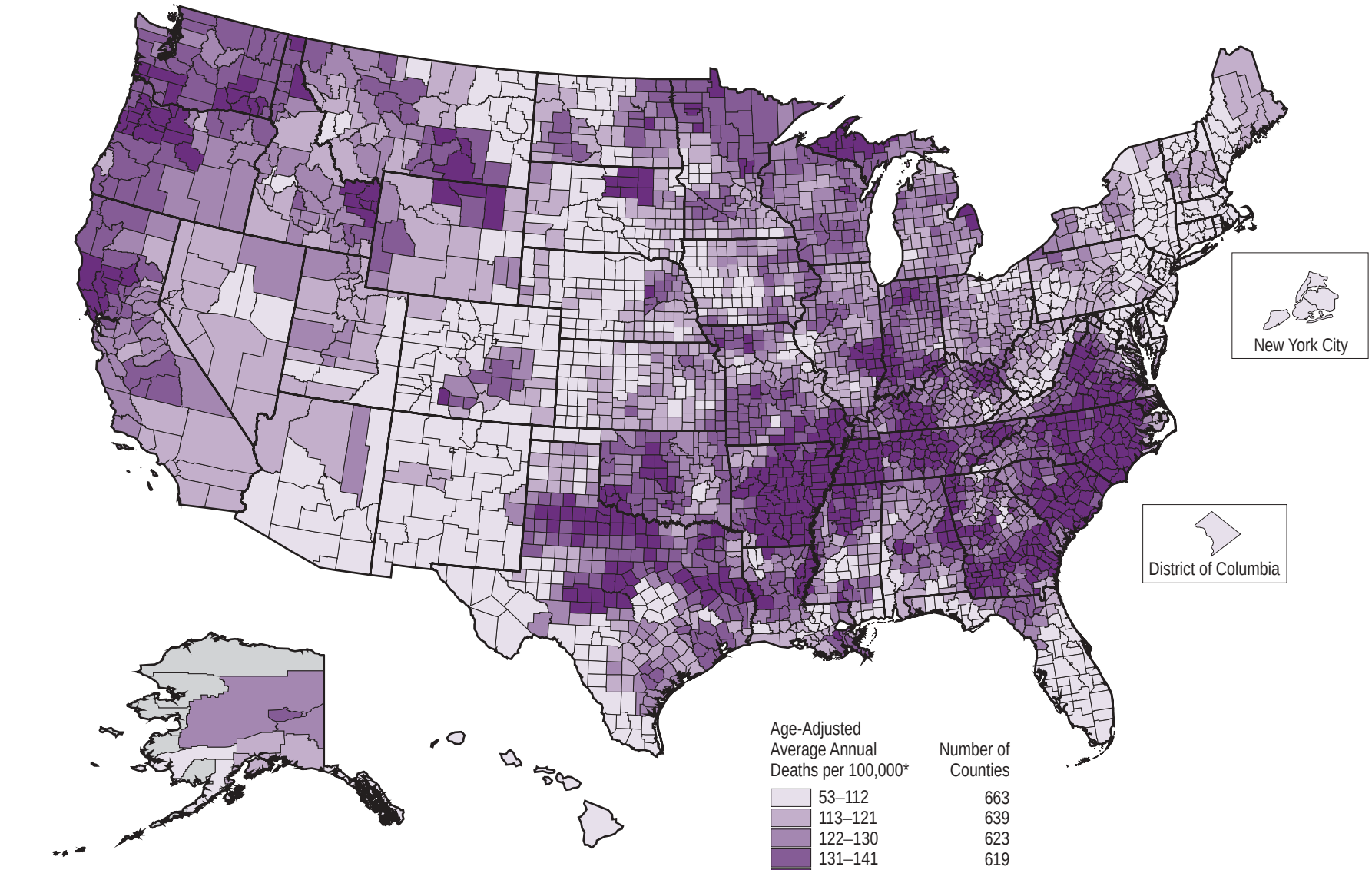
The maps indicate that for both white women and men, a majority of the counties in the southeastern states (except Florida) were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia) and parts of the Mississippi Delta had dense concentrations of counties in the highest quintiles for white women and white men. Differences in the geographic patterns between women and men were observed in the midwestern and western states. For white women, many of the counties in the western states were in the highest quintile. For white men, western counties in the highest quintiles were concentrated primarily in the Pacific Northwest and northern California; concentrations of counties with high rates also were observed in North Dakota and South Dakota.

A Note on Methods

Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

Smoothed County Stroke Death Rates
1991–1998

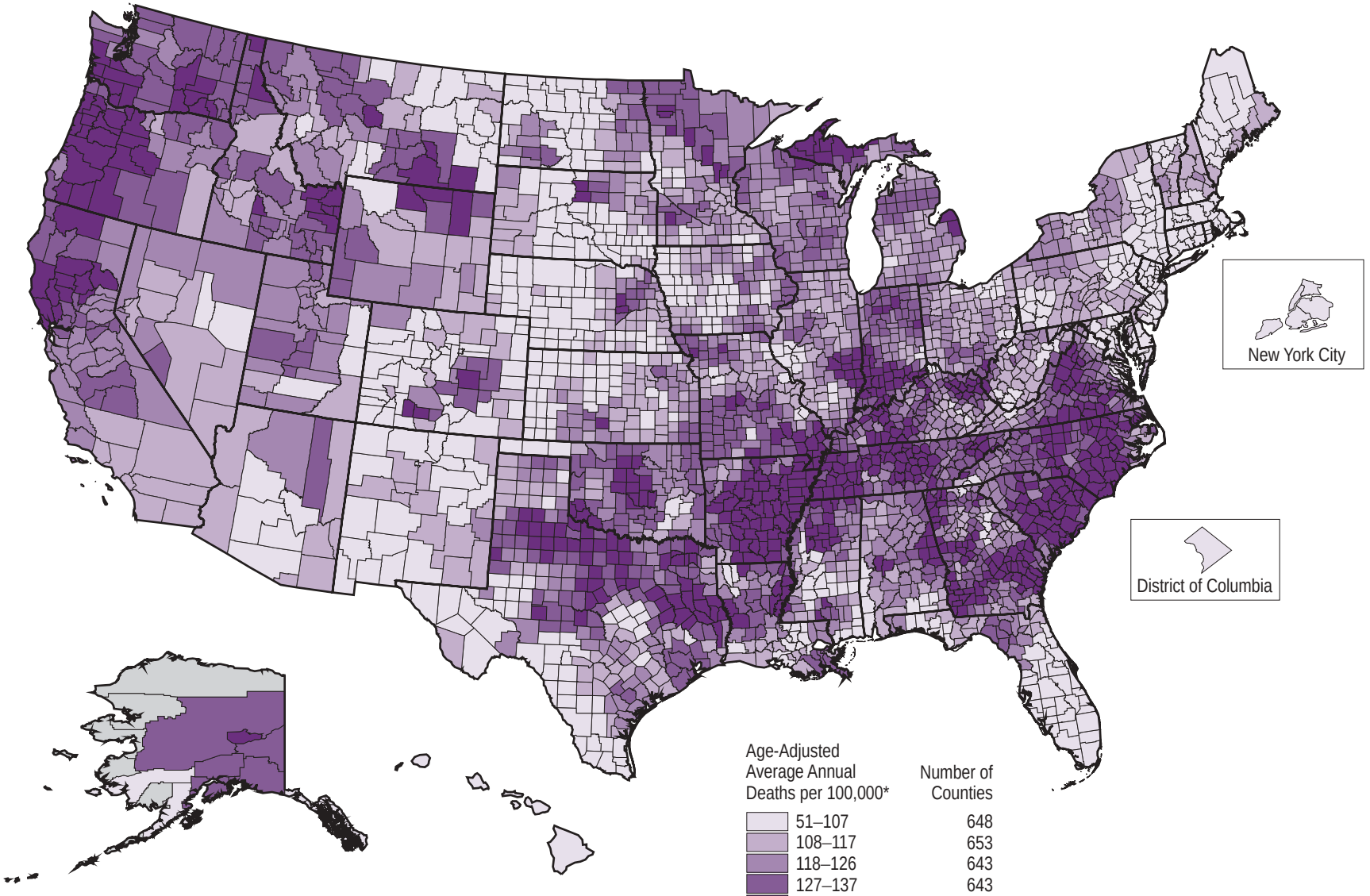
Whites
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

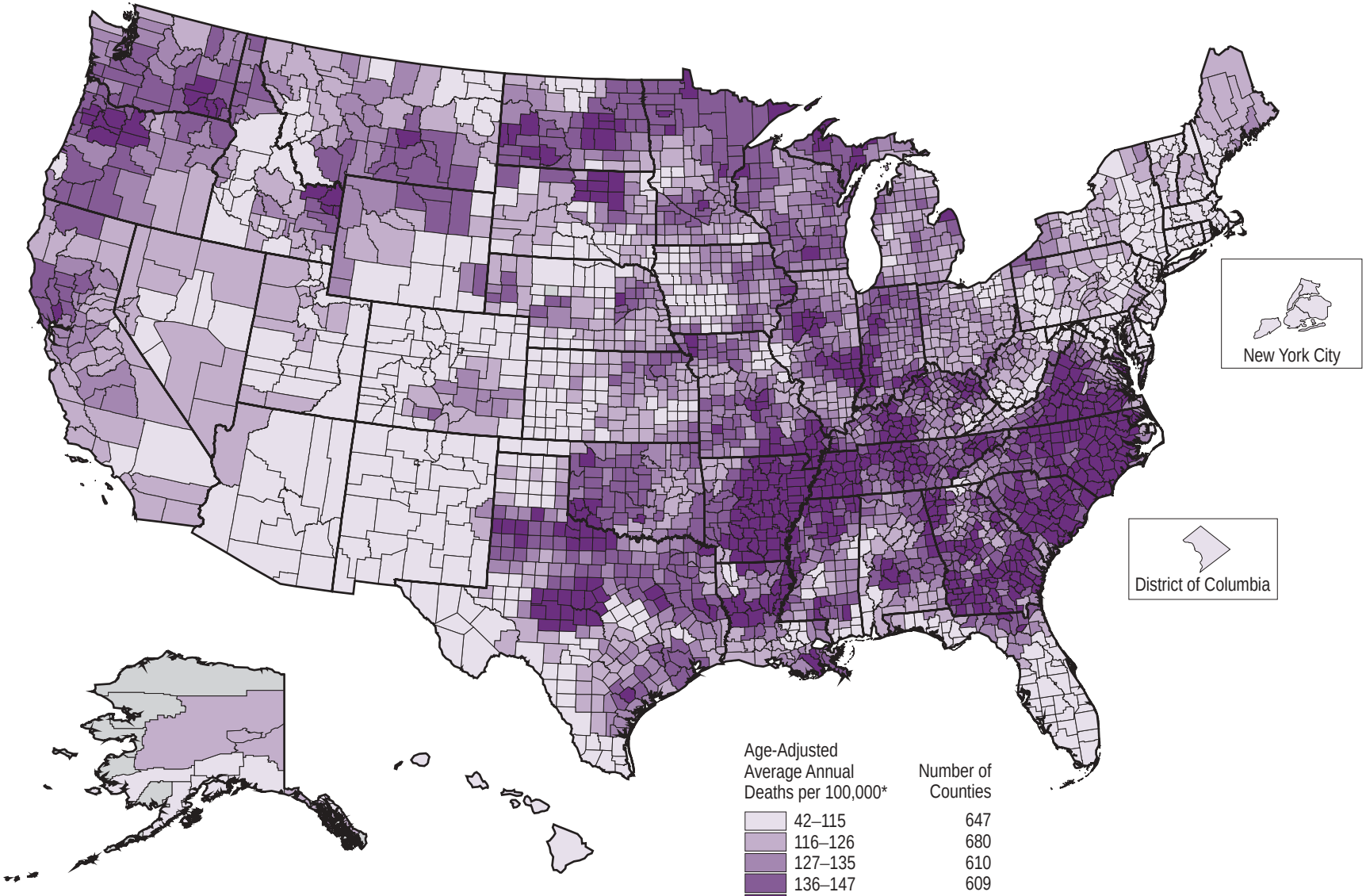
White Women
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates
1991–1998

White Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.