

4 National Maps
of Heart Disease
Mortality among
Women

In this section, national geographic disparities in heart disease death rates are examined for all women, Asian and Pacific Islander women, American Indian and Alaska Native women, black women, Hispanic women, and white women. Women ages 35 years and older who resided in the United States during 1991 to 1995 were the study population.

Each national map portrays spatially smoothed heart disease death rates for all counties, including Alaska, Hawaii, and the District of Columbia. Hawaii, New York City, and the District of Columbia are shown separately on each map, at a larger scale than the other states, to aid in visualization. Because of its very large land area, Alaska is shown at a smaller scale than the other states. The distribution of county heart disease death rates for each group of women was divided into quintiles (five categories with an equal number of counties) for the purposes of mapping. Counties in the highest quintile of heart disease mortality are the darkest color on the maps, while counties in the lowest quintile are the lightest color.

On the maps for African Americans, Asian and Pacific Islanders, American Indians and Alaska Natives, and Latinas, heart disease death rates were not calculated for a majority of counties nationwide. These counties are labeled “insufficient data” on the maps. In these counties and their surrounding areas, there were fewer than 20 heart disease deaths among women of the specified race or ethnic group over our five-year study period. For these areas of very low population and infrequent heart disease deaths, statistically reliable death rates could not be calculated (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 heart disease death rates for Latina women in these states. During 1991-1993, “unknown” Hispanic origin was recorded on approximately 22 percent of death certificates for women ages 35 years and older in New York City. Therefore, the heart disease death rates we report for Latinas in New York City may be underestimates.

Heart Disease Mortality – All Women

Overall, women aged 35 years and older in the United States experienced a heart disease death rate of 401 per 100,000 population during 1991-1995. However, there was considerable variation in the magnitude of heart disease death rates among the 3,103 counties for which data were available. Rates for counties ranged from 212 to 670 per 100,000, and the heart disease death rate at the midpoint of the top quintile (560 per 100,000) was twice as high as the midpoint of the lowest quintile (275 per 100,000). The frequency distribution graph (Figure 4.1) illustrates the range of geographic variation in death rates. The color bar along the x-axis of the graph shows the range of values for each of the five groups used for mapping the geographic variation in heart disease death rates among all women.

On the map (opposite page) counties were divided into five groups (quintiles) with an approximately equal number of counties in each group. The colors were graded so that counties of the darkest color were in the highest-rate quintile, and counties of the lightest color were in the lowest-rate quintile.

There was a clear east-west gradient in heart disease mortality among women during 1991-1995. Counties in the top two quintiles were located primarily within Appalachia, the Ohio-Mississippi River Valley, the Mississippi Delta, and the eastern

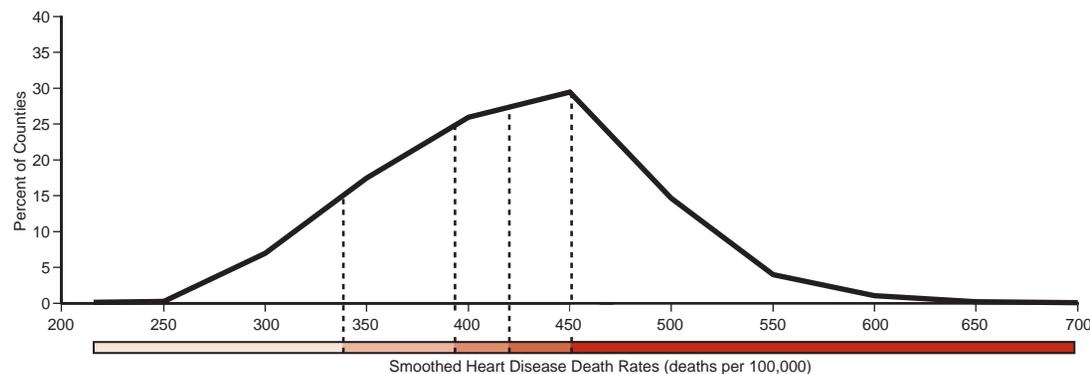
Piedmont and coastal regions of Georgia, South Carolina, and North Carolina. In Florida, the majority of counties experienced rates in the lowest two quintiles, while several of the northern counties had rates in the higher quintiles.

Most counties in the Pacific Northwest and Rocky Mountain areas of Colorado and New Mexico were in the lowest quintile. Another region of counties with low rates was in Wisconsin, North Dakota, and South Dakota. Alaskan and Hawaiian counties had rates in the lowest two quintiles. Along the border between Nevada and California and into southern California, counties had heart disease death rates in the middle quintiles.

A Note on Methods

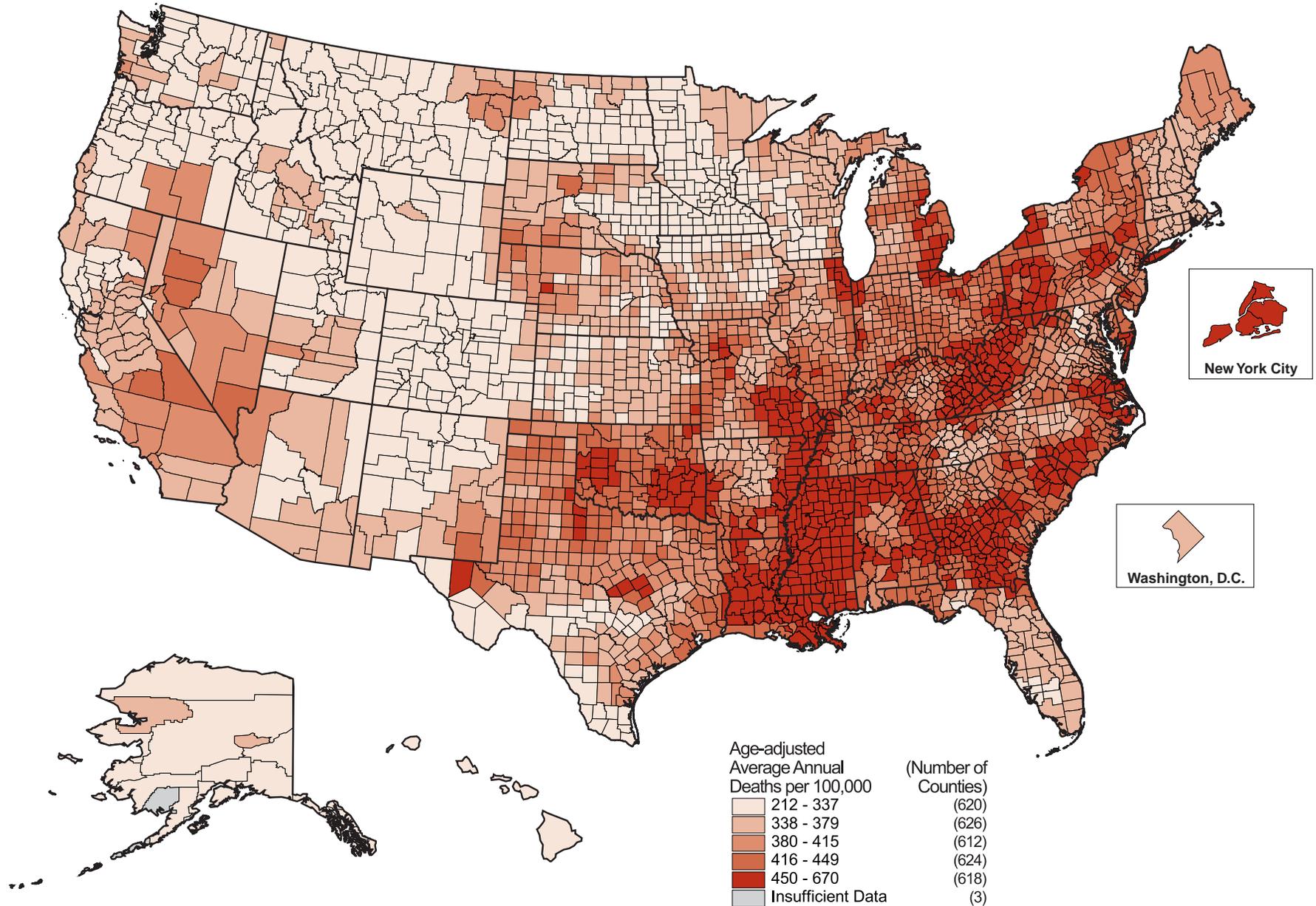
Heart disease deaths were defined as those for which the underlying cause of death listed on the death certificate was “diseases of the heart,” defined according to the International Classification of Diseases, Ninth Revision (codes 390-398, 402, and 404-429). Heart disease death rates were age-adjusted, with the 1970 U.S. population used as the standard, and spatially smoothed by using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the map can be found in Appendix B.

Figure 4.1
Frequency Distribution of Smoothed Heart Disease Death Rates for Counties, All Women, Ages 35 and Older, 1991-1995



Smoothed County Heart Disease Death Rates
1991-1995

All Women
Ages 35 Years and Older



Heart Disease Mortality – American Indian and Alaska Native Women

American Indian and Alaska Native women comprised 0.6% of all women aged 35 years and older in the United States in 1991. For the period 1991-1995, the heart disease death rate for American Indian and Alaska Native women was 259 per 100,000 population. Considerable geographic variation in the burden of heart disease mortality was evident across the 375 counties for which data were available (Figure 4.2). Rates for counties ranged from 97 to 1,000 per 100,000. There was nearly a fivefold difference in the heart disease death rate at the midpoint of the top quintile compared with the midpoint of the lowest quintile (784 deaths per 100,000 vs. 165 deaths per 100,000). The color bar along the x-axis of the graph shows the range of values for each of the five groups used for mapping the geographic variation in heart disease death rates among American Indian and Alaska Native women.

On the map (opposite page), counties were divided into five groups (quintiles) with an approximately equal number of counties in each group. The colors were graded so that counties of the darkest color were in the highest-rate quintile, and counties of the lightest color were in the lowest-rate quintile.

The American Indian and Alaska Native population in the United States is composed of many politically and culturally distinct Tribal Nations residing both in defined rural areas (in some cases reservations with limited political sovereignty) and in urban areas (see page 41 for a map of the geographic distribution of the American Indian and Alaska Native population of women). The map of heart disease death rates among American

Indian and Alaska Native women suggests that risk for heart disease varies greatly among the different Tribal Nations. Low rates of heart disease mortality were found in large metropolitan counties and surrounding areas (New York City, San Francisco, Los Angeles, Seattle, Anchorage). Low rates of heart disease mortality were also experienced by women in Oklahoma (predominantly Cherokee Nation) and New Mexico (predominantly Navajo Nation). High rates of heart disease mortality were experienced by women in South Dakota (predominantly Dakota Nation), Montana, and Minnesota (predominantly Chippewa Nation). An area of southeastern North Carolina is home to a large group of Lumbee Indians, who are not a federally recognized tribe. American Indian women in this area also experienced high rates of heart disease mortality.

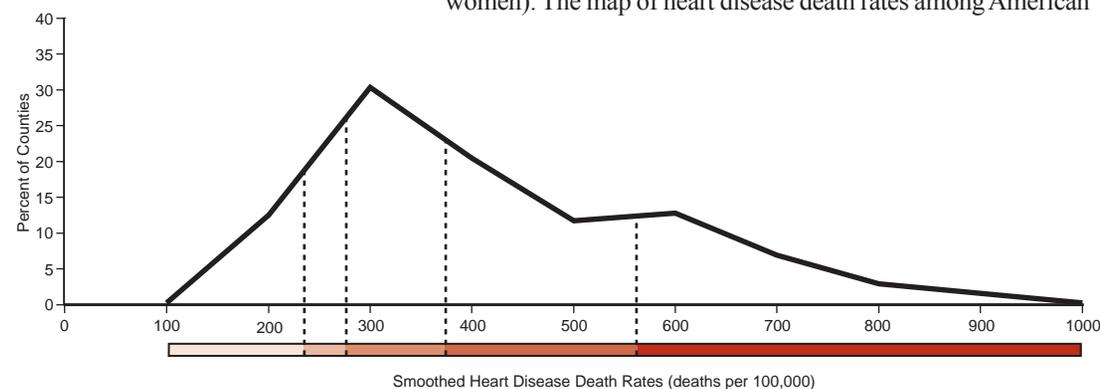
A Note on Methods

Heart disease deaths were defined as those for which the underlying cause of death listed on the death certificate was “diseases of the heart,” defined according to the International Classification of Diseases, Ninth Revision (codes 390-398, 402, and 404-429). Heart disease death rates were age-adjusted, with the 1970 United States population used as the standard, and spatially smoothed by using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the map can be found in Appendix B.

A Cautionary Note

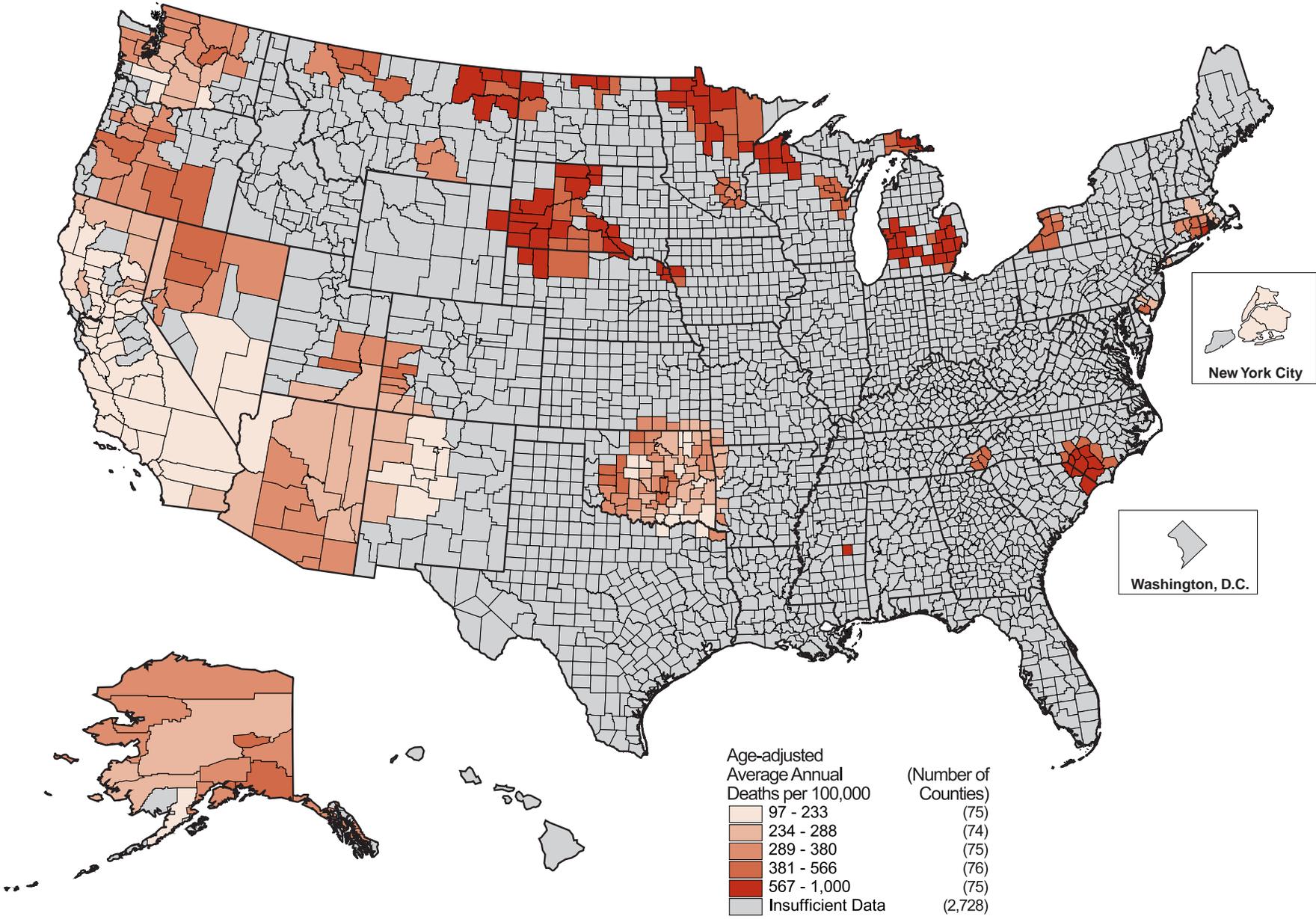
The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have shown that certain racial and ethnic minorities are sometimes misreported as “white” on death certificates (see page 21). Therefore, an unknown proportion of heart disease deaths among American Indian and Alaska Native women could not be included in the data analyses for this report. Consequently, the true heart disease death rates for American Indian and Alaska Native women were probably higher during 1991-1995 than indicated in Figures 4.2 and the map. In addition, if misreporting of race on death certificates were a greater problem in certain parts of the country than in others, then the geographic patterns presented here could be biased.

Figure 4.2
Frequency Distribution of Smoothed Heart Disease Death Rates for Counties, American Indian and Alaska Native Women, Ages 35 and Older, 1991-1995



Smoothed County Heart Disease Death Rates
1991-1995

American Indian and Alaska Native Women
Ages 35 Years and Older



Heart Disease Mortality – Asian and Pacific Islander Women

The heart disease death rate among Asian and Pacific Islander women aged 35 years and older during 1991-1995 was 221 per 100,000. Asian and Pacific Islander women comprised 2.7% of all women in this age group in 1991. There were 275 counties for which there were sufficient data to calculate heart disease death rates for Asian and Pacific Islander women. There was a substantial difference in the level of heart disease mortality between the counties in the highest and lowest quintiles. The heart disease death rate at the midpoint of the top quintile (261 per 100,000) was two times higher than the midpoint of the bottom quintile (124 per 100,000). Rates for counties ranged from 94 to 295 per 100,000 (Figure 4.3). The color bar along the x-axis of the frequency distribution graph shows the range of values for each of the five groups used for mapping the geographic variation in heart disease death rates among Asian and Pacific Islander women.

On the map (opposite page) counties were divided into five groups (quintiles) with an approximately equal number of counties in each group. The colors were graded so that counties of the darkest color were in the highest-rate quintile, and counties of the lightest color were in the lowest-rate quintile.

With the exception of Hawaii, the overwhelming majority of Asian and Pacific Islander women in the United States resided in metropolitan areas during 1991-1995 (see page 43 for the geographic distribution of the Asian and Pacific Islander population of women). Low rates of heart disease mortality were observed for the Houston, Dallas, and San Antonio metropolitan areas of Texas; central and southern Florida; northern New Jer-

sey; Connecticut, and the Boston, Minneapolis, and Chicago metropolitan areas. High rates of heart disease mortality were experienced by Asian and Pacific Islander women in New York City, most of California, southern Arizona, Salt Lake City, St. Louis, and Atlanta. Asian and Pacific Islander women in Washington, DC and Cleveland experienced intermediate-level heart disease death rates.

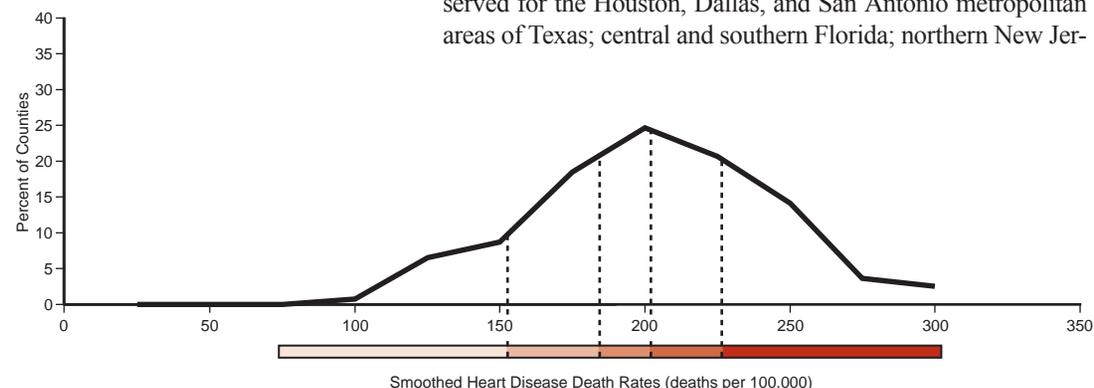
A Note on Methods

Heart disease deaths were defined as those for which the underlying cause of death listed on the death certificate was “diseases of the heart,” defined according to the International Classification of Diseases, Ninth Revision (codes 390-398, 402, and 404-429). Heart disease death rates were age-adjusted, with the 1970 United States population used as the standard, and spatially smoothed by using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the map can be found in Appendix B.

A Cautionary Note

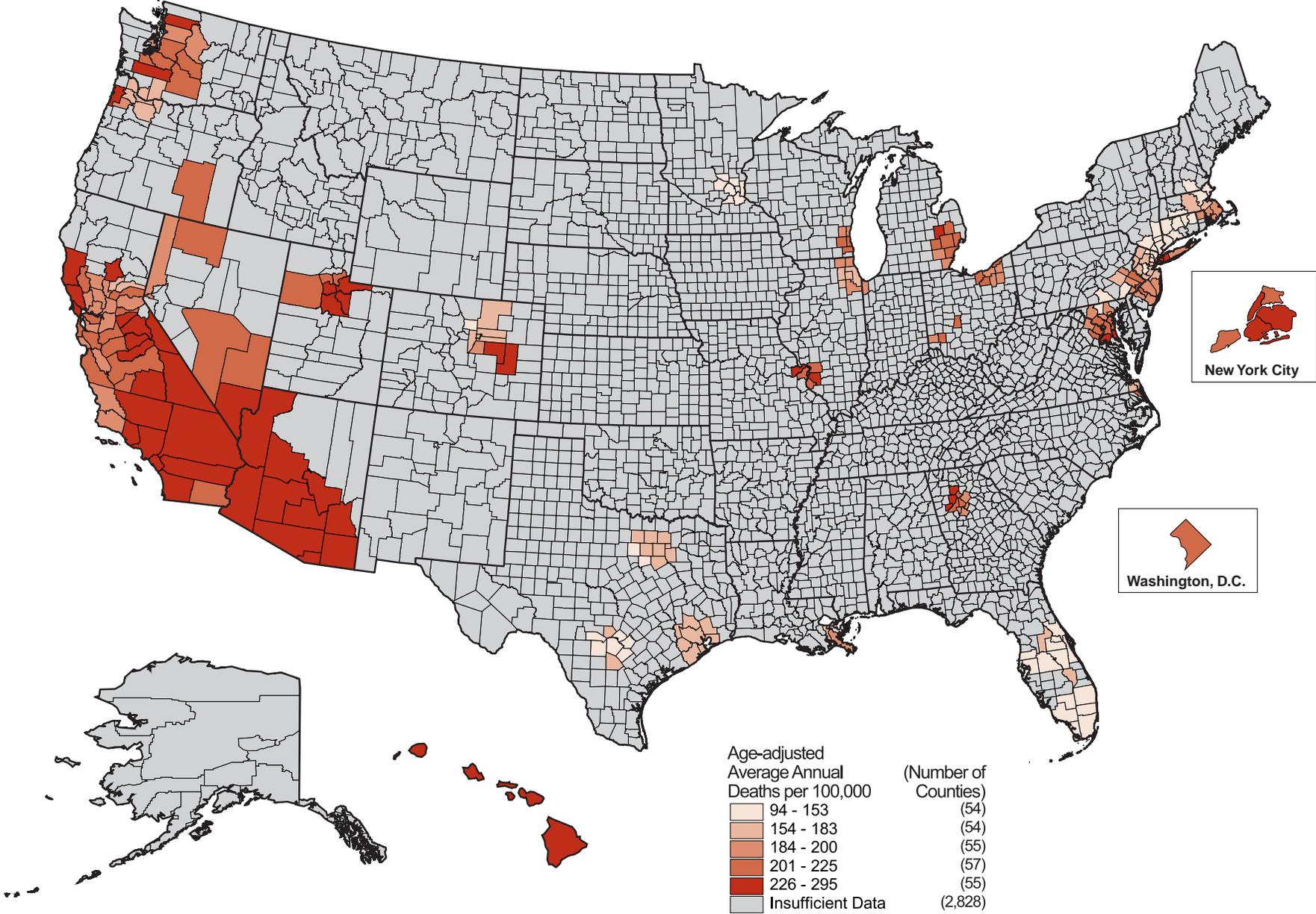
The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have shown that certain racial and ethnic minorities are sometimes misreported as “white” on death certificates (see page 21). Therefore, an unknown proportion of heart disease deaths among Asian and Pacific Islander women could not be included in the data analyses for this report. Consequently, the true heart disease death rates for Asian and Pacific Islander women were probably higher during 1991-1995 than shown in Figures 4.3 and the map. In addition, if misreporting of race on death certificates were a greater problem in certain parts of the country than in others, then the geographic patterns presented here could be biased.

Figure 4.3
Frequency Distribution of Smoothed Heart Disease Death Rates for Counties, Asian and Pacific Islander Women, Ages 35 and Older, 1991-1995



Smoothed County Heart Disease Death Rates
1991-1995

Asian and Pacific Island Women
Ages 35 Years and Older



Heart Disease Mortality – Black Women

Blacks were the largest racial and ethnic minority group among women aged 35 years and older in 1991, comprising 10.5% of all women. Overall, African American women experienced a heart disease death rate of 553 per 100,000 during 1991-1995. However, the 1,930 counties for which sufficient data were available exhibited considerable variation in the magnitude of heart disease death rates for black women. Rates for counties ranged from 124 to 1,275 per 100,000 (Figure 4.4), and the heart disease death rate at the midpoint of the top quintile (973 per 100,000) was three times higher than the rate at the midpoint of the bottom quintile (133 per 100,000). The color bar along the x-axis of the frequency distribution graph shows the range of values for each of the five groups used for mapping the geographic variation in women's heart disease death rates.

On the map (opposite page) counties were divided into five groups (quintiles) with an approximately equal number of counties in each group. The colors were graded so that counties of the darkest color were in the highest-rate quintile, and counties of the lightest color were in the lowest-rate quintile.

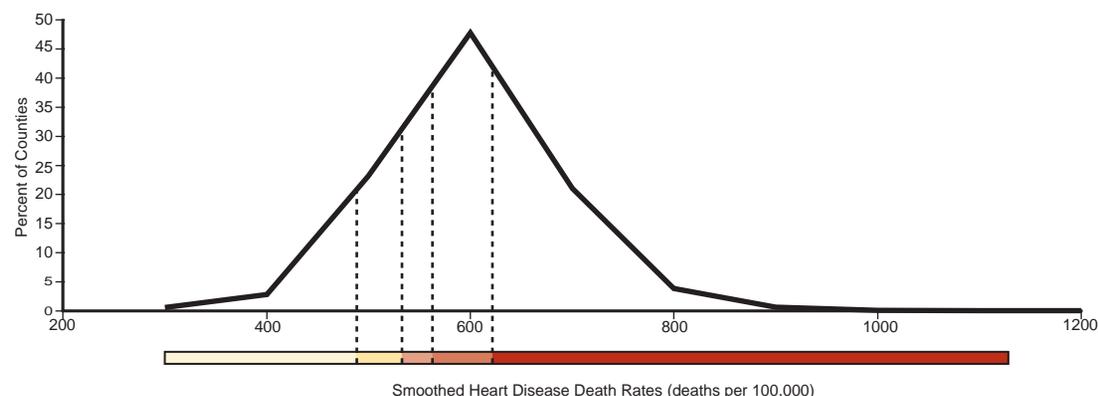
The map of heart disease mortality among African American women indicates that the counties in the top quintile are con-

centrated primarily in the southern portion of the Mississippi River Valley and Delta region. High heart disease death rates were also found in some counties in California, Oklahoma, Texas, and the Detroit and Chicago metropolitan areas. Black women experienced the lowest heart disease death rates in the District of Columbia, Minneapolis, Denver, and Albuquerque metropolitan areas, and in parts of New England and the Pacific Northwest.

A Note on Methods

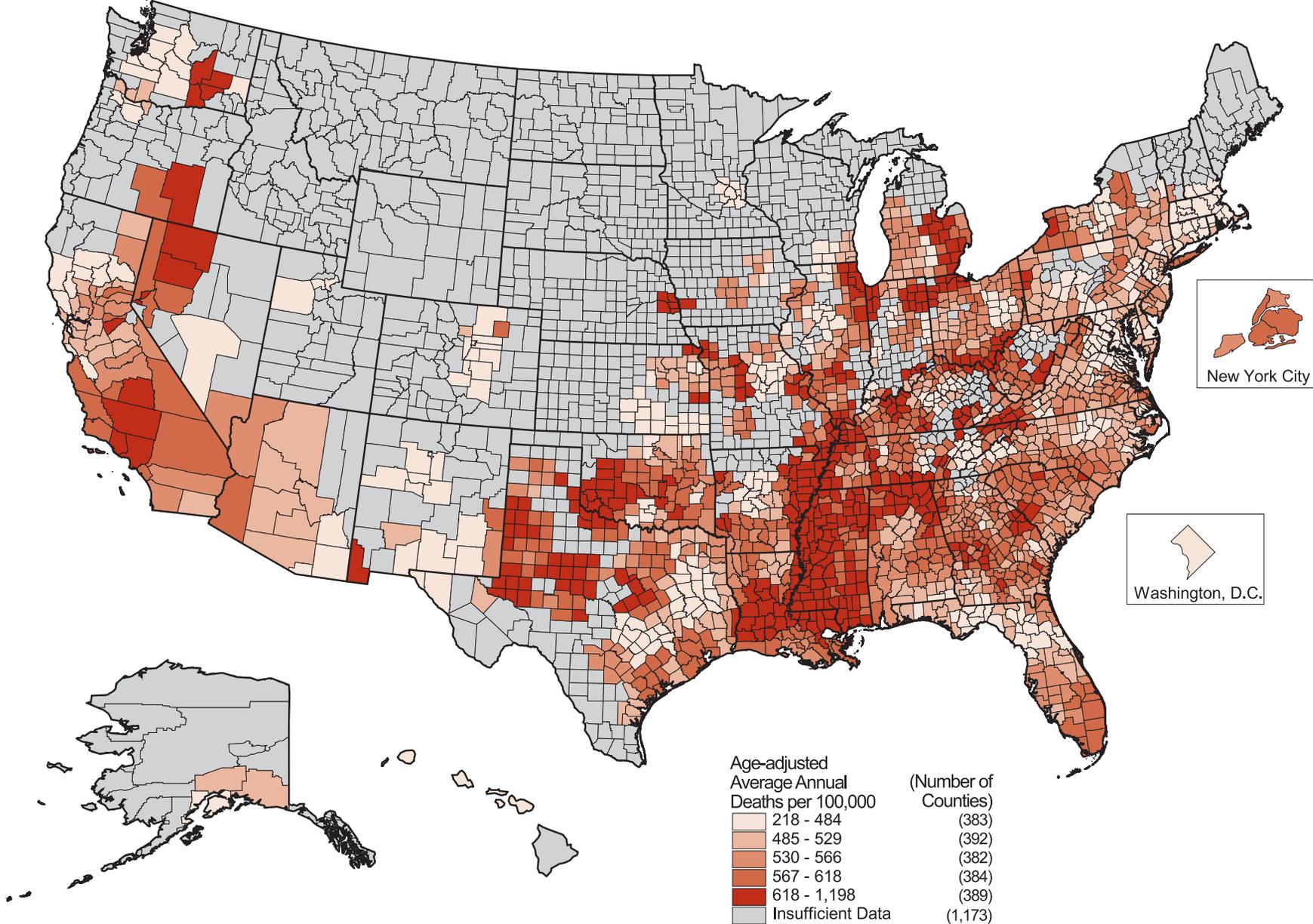
Heart disease deaths were defined as those for which the underlying cause of death listed on the death certificate was “diseases of the heart,” defined according to the International Classification of Diseases, Ninth Revision (codes 390-398, 402, and 404-429). Heart disease death rates were age-adjusted, with the 1970 United States population used as the standard, and spatially smoothed by using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the map can be found in Appendix B.

Figure 4.4
Frequency Distribution of Smoothed Heart Disease Death Rates for Counties, Black Women, Ages 35 and Older, 1991-1995



Smoothed County Heart Disease Death Rates
1991-1995

Black Women
Ages 35 Years and Older



Heart Disease Mortality – Hispanic Women

Latinas were the second largest racial and ethnic minority group among women aged 35 years and older in 1991, comprising 6.1% of all women. For the period 1991-1995, the heart disease death rate for Hispanic women was 265 per 100,000 population. Considerable geographic variation in the burden of heart disease mortality was evident across the 718 counties for which data were sufficient to calculate a rate (Figure 4.5). Rates for counties ranged from 82 to 656 per 100,000. There was nearly a fourfold difference in the heart disease death rate at the midpoint of the top quintile compared with the midpoint of the lowest quintile (481 deaths per 100,000 and 131 deaths per 100,000). The color bar along the x-axis of the frequency distribution graph shows the range of values for each of the five groups used for mapping the geographic variation in women's heart disease death rates.

On the map (opposite page) counties were divided into five groups (quintiles) with an approximately equal number of counties in each group. The colors were graded so that counties of the darkest color were in the highest-rate quintile, and counties of the lightest color were in the lowest-rate quintile

The Latina population in the United States is concentrated in both rural (predominantly Southwest) and urban/metropolitan areas (see page 47 for the geographic distribution of the Hispanic population on women). The map of heart disease death rates among Latina women shows marked geographic variation. Low rates of heart disease mortality were experienced by women in northern California and the Pacific Northwest, most

of Florida, and in the Boston, Pittsburgh, Cleveland, Washington-Baltimore, Atlanta, and New Orleans metropolitan areas. The highest rates of heart disease mortality were experienced by women in New York City, eastern Pennsylvania, Miami, and in the rural areas of Texas, New Mexico, Arizona, Colorado, and California. Hispanic women in metropolitan areas of the Southwest such as Houston, Dallas, Albuquerque, and San Diego experienced intermediate-level heart disease mortality rates.

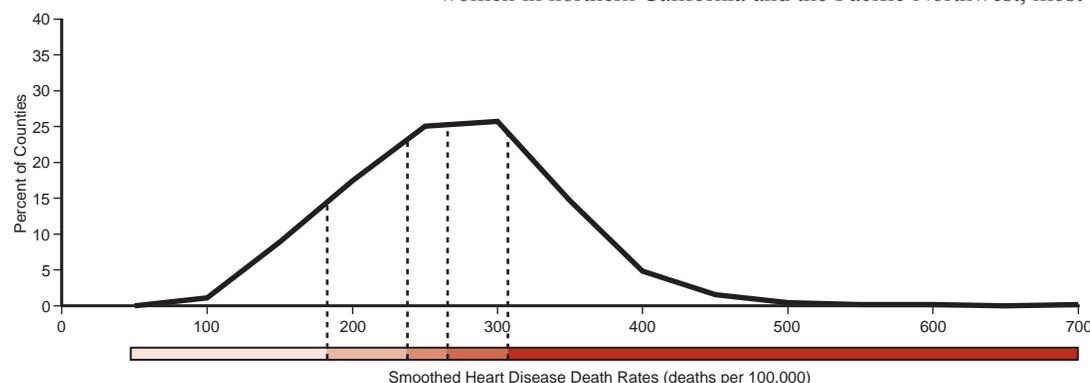
A Note on Methods

Heart disease deaths were defined as those for which the underlying cause of death listed on the death certificate was “diseases of the heart,” defined according to the International Classification of Diseases, Ninth Revision (codes 390-398, 402, and 404-429). Heart disease death rates were age-adjusted, with the 1970 United States population used as the standard, and spatially smoothed by using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the map can be found in Appendix B.

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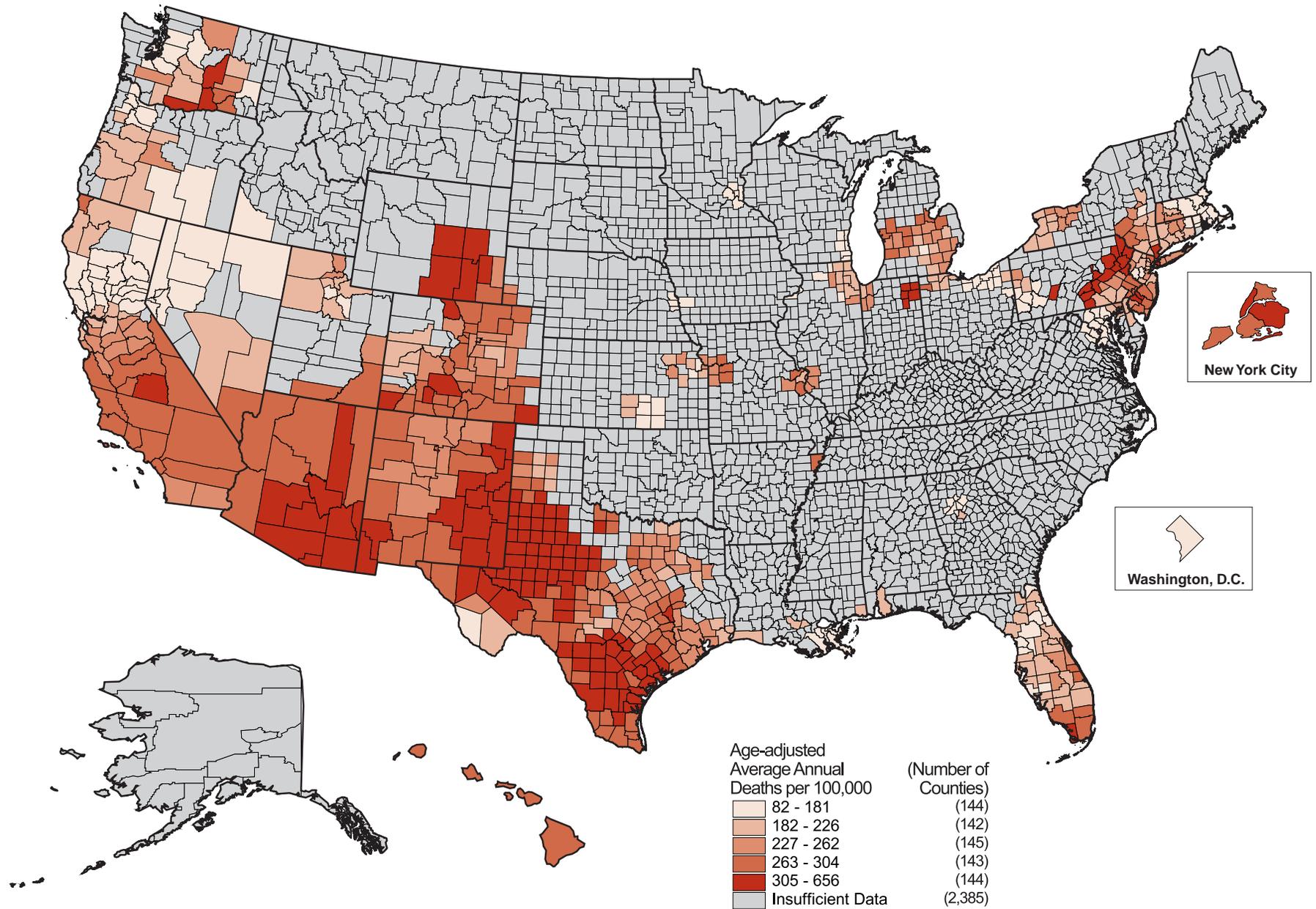
The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have shown that Hispanics are sometimes misreported as non-Hispanic on death certificates (see page 21). Therefore, an unknown proportion of heart disease deaths among Latina women could not be included in the data analyses for this report. In New York City, approximately 22% of death certificates for women ages 35 and older recorded Hispanic origin as “unknown” during 1991-1993. Consequently, the true heart disease death rates for Hispanic women were probably higher during 1991-1995 than shown in Figures 4.5 and this map. 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.

Figure 4.5
Frequency Distribution of Smoothed Heart Disease Death Rates for Counties, Hispanic Women, Ages 35 and Older, 1991-1995



Smoothed County Heart Disease Death Rates
1991-1995

Hispanic Women
Ages 35 Years and Older



Heart Disease Mortality – White Women

White women comprised 86.3% of all women aged 35 years and older in 1991. Overall, the heart disease death rate among white women was 388 per 100,000 for the period 1991-1995. Substantial geographic variation in heart disease death rates was observed among the 3,096 counties for which sufficient data were available to calculate rates. There was a substantial difference in the level of heart disease mortality between the counties in the highest and lowest quintiles (Figure 4.6). The heart disease death rate at the midpoint of the top quintile (514 per 100,000) was nearly two times higher than the midpoint of the bottom quintile (273 per 100,000). Rates for counties ranged from 212 to 591 per 100,000. The color bar along the x-axis of the frequency distribution graph shows the range of values for each of the five groups used for mapping the geographic variation in women's heart disease death rates.

On the map (opposite page), counties were divided into five groups (quintiles) with an approximately equal number of counties in each group. The colors were graded so that counties of the darkest color were in the highest-rate quintile, and counties of the lightest color were in the lowest-rate quintile.

A clear east-west gradient in heart disease death rates among white women was evident for 1991-1995, with the highest rates occurring predominantly in the eastern portion of the United States and the lowest rates occurring predominantly in the western section. Counties in the top two quintiles were located

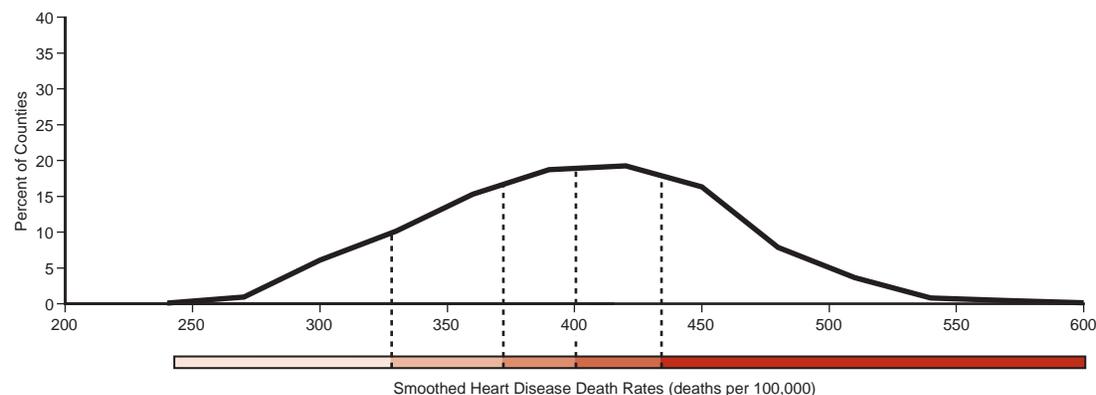
primarily within much of Appalachia, the Mississippi-Ohio River Valley, Mississippi Delta, and Piedmont and coastal regions of Georgia, South Carolina, and North Carolina. In Florida, most counties had rates in the bottom two quintiles but several northern counties had rates in the higher quintiles.

Large sections of the northwestern states south through Colorado and New Mexico had counties in the lowest quintile of heart disease mortality. Another area of counties with low rates was in Wisconsin, North Dakota, and South Dakota. Alaska and Hawaii both had counties in the lower quintiles. Along the border between Nevada and California and in southern California, intermediate levels of heart disease mortality among white women were observed.

A Note on Methods

Heart disease deaths were defined as those for which the underlying cause of death listed on the death certificate was “diseases of the heart,” defined according to the International Classification of Diseases, Ninth Revision (codes 390-398, 402, and 404-429). Heart disease death rates were age-adjusted, with the 1970 U.S. population used as the standard, and spatially smoothed by using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the map can be found in Appendix B.

Figure 4.6
Frequency Distribution of Smoothed Heart Disease Death Rates for Counties, White Women, Ages 35 and Older, 1991-1995



Smoothed County Heart Disease Death Rates
1991-1995

White Women
Ages 35 Years and Older

