ORIGINAL RESEARCH

# Spatiotemporal and Demographic Trends and Disparities in Cardiovascular Disease Among Older Adults in the United States Based on 181 Million Hospitalization Records

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***Background*—**The US population is aging, with concurrent increases in cardiovascular disease (CVD) burdens; however, spatiotemporal and demographic trends in CVD incidence in the US elderly have not been investigated in detail. This study aims to characterize trends from 1991 to 2014 in CVD hospitalizations among US Medicare beneficiaries, aged 65+ years, by single year of age/sex/race/state using records from the US Centers for Medicare & Medicaid, covering 98% of older Americans.

***Methods and Results*—**We abstracted 181 202 758 US Centers for Medicare & Medicaid hospitalization records indicating CVD in any of 10 diagnosis codes; tabulated total cases of CVD by sex, age, race, state, and calendar year (1991–2014); and normalized hospitalization counts to standardize over data batches. Stratum-specific hospitalization rates were calculated using US Centers for Medicare & Medicaid records and US Census population counts; a cubic polynomial function was fit to year-specific distributions of rates by single year of age. Nationwide, CVD-related hospitalization rates increased from 1991 to 2014. Differences between hospitalization rates at age 65 and 66 years, representing magnitude of healthcare deferral until Medicare onset, increased by 7.49 per 100 people 1991 to 2006 overall, and were largest among blacks and Native Americans. Rates of CVD hospitalizations were consistently highest in the Midwest/Deep South. Evidence of misclassification of race/ethnicity in US Centers for Medicare & Medicaid hospitalization records in the 1990s was noted.

***Conclusions*—**Trends in CVD-related hospitalization rates among older Americans highlight the essential need for targeted policies to reduce CVD burdens, to improve reporting of race/ethnicity in large administrative databases, and to enhance access to affordable healthcare. **(*J Am Heart Assoc*. 2019;8:e012727. DOI: 10.1161/JAHA.119.012727.)**

**Key Words:** aging • cardiovascular disease • disparities • hospitalization • Medicare

Cardiovascular disease (CVD) is the leading cause of death and disability in the United States in both men and women, currently causing ~1 of every 4 deaths, and 85.6 million cases.[1] Over half of prevalent CVD cases and 80% of CVD deaths occur in adults aged 65 years and over, and the US population is rapidly aging; by 2030, older adults will comprise ~20% of the US population and average life expectancy will approach 80 years of age.[2] In combination, the overall declining trend in age-specific CVD mortality over the past half-century,[1] the aging of the US population, and increasing life expectancy will have major impacts on CVD burdens among older adults.[2]

Prior investigations of CVD-related hospitalization patterns in the US elderly have revealed disparities by sex and race/ethnicity, with higher hospitalization rates for myocardial infarction, heart failure, and stroke in men compared with women and higher hospitalization rates for heart failure and stroke in blacks, Hispanics, and Native Americans compared with whites;[3] however, these investigations were limited to a single year and did not assess trends by time or by granular age category. Other analyses of CVD trends in the United States examined mortality but not morbidity in the elderly population.[4] Of those investigating CVD morbidity, several focused only on particular CVD subtypes and not on total CVD,[5–10] or on particular types of hospital admissions or comorbid conditions.[11–18]

To date, long-term trends in total CVD-related hospitalization rates in the US elderly, including spatial distributions

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Accompanying Tables S1 through S3 and Figures S1, S2 are available at https://www.ahajournals.org/doi/suppl/10.1161/JAHA.119.012727

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## Clinical perspective

### What Is New?

- Detailed examination of spatiotemporal and demographic trends among older Americans revealed overall increases in cardiovascular disease (CVD)-related hospitalization rates among older Americans, increases in acceleration of age-related CVD hospitalization rates over 2 decades, increasing rates of deferral of CVD-related health care to the age of Medicare onset, particularly among Blacks and Native Americans, and highest CVD-related hospitalization rates among older men and women in the southern and midwestern United States.

### What Are the Clinical Implications?

- For clinicians and public health professionals, this study emphasizes the urgent need to focus on primary prevention of CVD among younger populations, through proven cost-effective approaches such as improvements in diet and lifestyle, to prevent ever-larger burdens of CVD morbidity among older populations, particularly as the US population ages.
- Access to affordable health care for all Americans throughout the life course is imperative in order to prevent deferral of healthcare access until Medicare onset, which results in sicker patients and higher healthcare costs; furthermore, clinical and public health resources must be dedicated to improving the cardiovascular health of underserved rural and minority populations.

and disparities by sex or race/ethnicity, have not yet been examined in depth using data with full coverage of the elderly population and in granular age categories. Gaps in knowledge of heterogeneities by age, sex, race/ethnicity, and geographic location over time hinder the development of effective targeted strategies for curbing CVD burdens in the elderly[19,20] as well as the forecasting of future CVD trends, which are crucial to appropriate resource allocation.[21–23]

In this analysis we examine, in detail, trends in total CVD among older Americans, including temporal trends from 1991 to 2014, demographic trends by age, sex, and race/ethnicity, and geographic trends by state and region, using hospitalization records from the US Centers for Medicare & Medicaid Services (CMS),[24] which provide the most comprehensive data available on the hospitalizations in the US population aged 65 years and over. In particular, we investigate age trajectories of hospitalization in the elderly over time, between demographic subgroups, and by geographic region using single-year age distributions in order to provide detailed characterization of national and subnational trends in CVD among the US elderly.

## Methods

Summary statistics, results of modeling, and aggregated anonymized information that support the findings of this study are available from the corresponding author upon reasonable request.

### Data Abstraction

Hospitalization records of Medicare beneficiaries aged 65 and older were obtained from CMS; Medicare provides health coverage for almost all older adults (98%) in the United States.[24] We abstracted 181 202 758 hospitalization records compiled by CMS indicating CVD diagnosis in any of the 10 hospitalization diagnosis codes recorded by CMS, and tabulated total cases of CVD by sex, age (single year or age group), state, and calendar year (1991–2014). We included major CVD subtypes impacting the US population,[25] including ischemic heart disease, hemorrhagic stroke, ischemic stroke, rheumatic heart disease, hypertensive heart disease, cardiomyopathy and myocarditis, atrial fibrillation and flutter, peripheral artery disease, endocarditis, aortic aneurysm, congestive heart failure, and other cardiovascular and circulatory diseases. Detailed *International Classification of Diseases, Ninth Revision (ICD-9)* codes for all disease outcomes are provided in Table S1. Data by single year of age were obtained from CMS for 1991 to 2006. For 2008 to 2014, data aggregated by 5-year age groups for individuals aged 65 years and over were provided by CMS. For clarity and brevity, even years of data are depicted in key figures showing general trends over time; data for 2007 were requested from CMS but were not provided as of the drafting of this article and therefore have not been included in this analysis.

### Analysis of CVD Hospitalization Rates

Annual population counts for the US population aged 65 years and over by single year of age, sex, and race were obtained from US Census and intercensal estimates spanning the time period 1991 to 2014.[26] To preserve the integrity and continuity of data sets across 24 years, we performed data standardization. We explored the use of "Other" and "Unknown" categories in reporting race over time and investigated how the distributions of these categories changed over time. Hospitalization rates were calculated by dividing stratum-specific hospitalization counts by population counts for each calendar year of data. For the 1991 to 2006 time period, data were available by single year of age, and it was possible to investigate the changes in hospitalization rate with each year of age using a modified version of the Slope-Intercept Method for Population Log-linear Estimation (SIMPLE),[27] utilizing a polynomial function for the $\log_e$-transformed

rates. First-, second-, and third-degree polynomial functions were tested, with the third-degree polynomial function exhibiting the best fit to the data, indicated by $R^2$>98% for each calendar year. (Table S2). Equation 1 describes the model:

$$\ln(\text{rate}_{aij}) = \beta_0 + \beta_1(a_{ij}) + \beta_2(a_{ij})^2 + \beta_3(a_{ij})^3 \quad (1)$$

specifying the single-year age distribution of $\log_e$-transformed hospitalization rates for a – centered year of age, for i – calendar year (i=1991–2004), and for j–population subgroup of interest based on sex and race. We centered the age variable at age 65 years, so a=1 to 35 represents ages from 66 to 99, and the intercept of the model $\beta_0$ reflects the predicted hospitalization rate when Medicare benefits become available to the eligible US residents.

Model coefficients were estimated for the total elderly population and each population subgroup of interest and were used to predict age-, year-, and population-specific rates and rates at age 65 years. Both actual and predicted CVD hospitalization rates as single-year age distributions were presented for the entire country stratified by sex using heatmap plots. Differences in predicted single-year age distributions were stratified by age and race/ethnicity, and the Kolmogorov-Smirnov test was used to determine the statistical significance of differences between single-year age distributions.

## Normalization of Hospitalization Rates for 1998 to 2002

Batches of administrative records were purchased at discrete time points over the past 2 decades. The separate data batches included 1991 to 1997, 1998 to 2002, 2003 to 2004, 2005 to 2006, and 2008 to 2014. Due to differences in data preparation algorithms used by CMS over time, on occasion, data batches can have universally lower or higher numbers of records than preceding or subsequent data batches. However, as such differences universally affect a data batch, they are unlikely to bias overall trends within the data. In order to assemble a long time series of data such as that spanning 1991 to 2014, investigators can either re-purchase the entire data set from CMS, or utilize already-purchased data and develop methods to account for differences in data batch preparation and integrate such batches harmoniously. The prohibitive cost of repurchasing the entire time series from CMS led us to utilize the latter option. Noting differences in batch preparation of data by CMS because of data purchasing structure, we found the overall counts of CVD-related hospitalization for years 1998 to 2002 were lower than the batches of 1991 to 1997, 2003 to 2004, 2005 to 2006, and 2008 to 2014. To normalize the rates for these periods while retaining the integrity of age and time trends, we used an offset based on the hospitalization rates for the year preceding the adjusted period ($h_0$) and the first year of the adjusted period ($h_1$), where the offset is:

$$d = h_0 - h_1 \quad (2)$$

Therefore, adjusted age-specific rates, $H^*_{k,i}$, were calculated as:

$$h^*_{k,i} = (d + h_i)(h_{k,i}/h_i) \quad (3)$$

where $H_i$ is an original annual rate for year i, and $h_{k,i}$ is an age-specific rate for age k in year i.

More complex versions of this data normalization technique are commonly used for other massive data sets, such as those obtained through remote sensing, where records must be mosaicked in order to obtain a full image.[28]

## Estimation of Maximal Year-Specific Rates and Peak Age of Hospitalization Counts

The age at which CVD-related hospitalization rates reach their maximum was estimated by determining the rate at the local maximum of the third-degree polynomial function applied to the single-year age distribution. Similarly, for each calendar year, peak age of hospitalization counts were estimated by determining the local maximum of the curve fitting the single-year age distribution of CVD-hospitalization counts. For years in which only age-group data were available (2008–2014), the age at the maximum rate was determined across aggregate age groups.

Use of CMS data in these analyses has been approved by the Tufts University Health Sciences Campus Institutional Review Board, which is manifested through Data Use Agreements with Tufts University and the US Centers for Medicare & Medicaid Services. The Institutional Review Board determined that this research is not research involving human subjects as defined by US Department of Health and Human Services and Food and Drug Administration regulations; therefore, the need for informed consent has been waived. All analyses were conducted using R version 3.1.2.

# Results

## National Trends by Year, Age, Sex, and Race/Ethnicity

Between 1992 and 2014, the Medicare-eligible elderly population in the United States increased by 44% from 32.1 million in 1992 to 46.2 million in 2014, and the total number of CVD hospitalizations in the same population and period increased by 69% from 7.2 million in 1992 to 12.2 million in

2014 (Figure 1A). Hospitalization rates related to CVD among the population aged 65 years and over were similar among men and women, increased across the 24-year period among both men and women, and also increased with age across 5-year age groups (Figure 1B and 1C).

Tabulation of CVD hospitalization counts by race/ethnicity revealed misclassification of race/ethnicity for Native Americans, Asians, and Hispanics in the 1990s when up to 400 000 Medicare participants hospitalized for CVD were classified into "other" and "unknown" race/ethnicity categories; this number declined with time, stabilizing between 125 000 and 180 000 after 2000 (Figure 1D). Concurrent with declines in hospitalizations categorized as "other" and "unknown" race/ethnicity, CVD hospitalizations reported for Native Americans, Hispanics, and Asians increased from <100 000 in 1994 to almost 400 000 in 2014, reflecting both improved collection of data on race/ethnicity and, to some extent, population growth (Figure 1E). Because of misclassification of race/ethnicity in CMS hospitalization data in the 1990s, rates of CVD-related hospitalizations for Native Americans, Hispanics, and Asians during this time period are significantly underestimated until at least 1996 (Figure 1F), as there were almost certainly CVD-related hospitalizations for these populations before this time period that were not adequately captured in CMS records.[29] By CVD subtype, hospitalization burdens were highest for ischemic heart disease and heart failure and lowest for hemorrhagic stroke, with similar time trends across subtypes (Figure 2).

## Subanalysis of Granular Trends by Single-Year of Age, Sex, and Race/Ethnicity, 1991 to 2006

From 1991 to 2006, the period for which CMS data were provided by single-year of age enabling detailed investigation of CVD hospitalization distributions by age, the national distributions of CVD hospitalization rates by single year of age for the US elderly aged ≥65 were best described by a third-degree polynomial function, which appropriately fits the steep increases in CVD hospitalization rates through the eighth or ninth decade of life, and the flattening or decrease in rates thereafter (Figure 3). The intercept of this cubic polynomial indicates the predicted rate at age 65 years, the age of Medicare eligibility; the coefficient of the linear term characterizes the linear increase in hospitalization rate with age; that of the quadratic term describes the acceleration in the rate of linear increase; and that of the cubic term quantifies the flattening or downturn after the peak in the curve. Age-specific CVD-related hospitalization rates increased during 1991 to 2006 across the entire elderly population as demonstrated by the annual upwards shift in the single-year age distribution curves in Figure 3 and Figure S1.

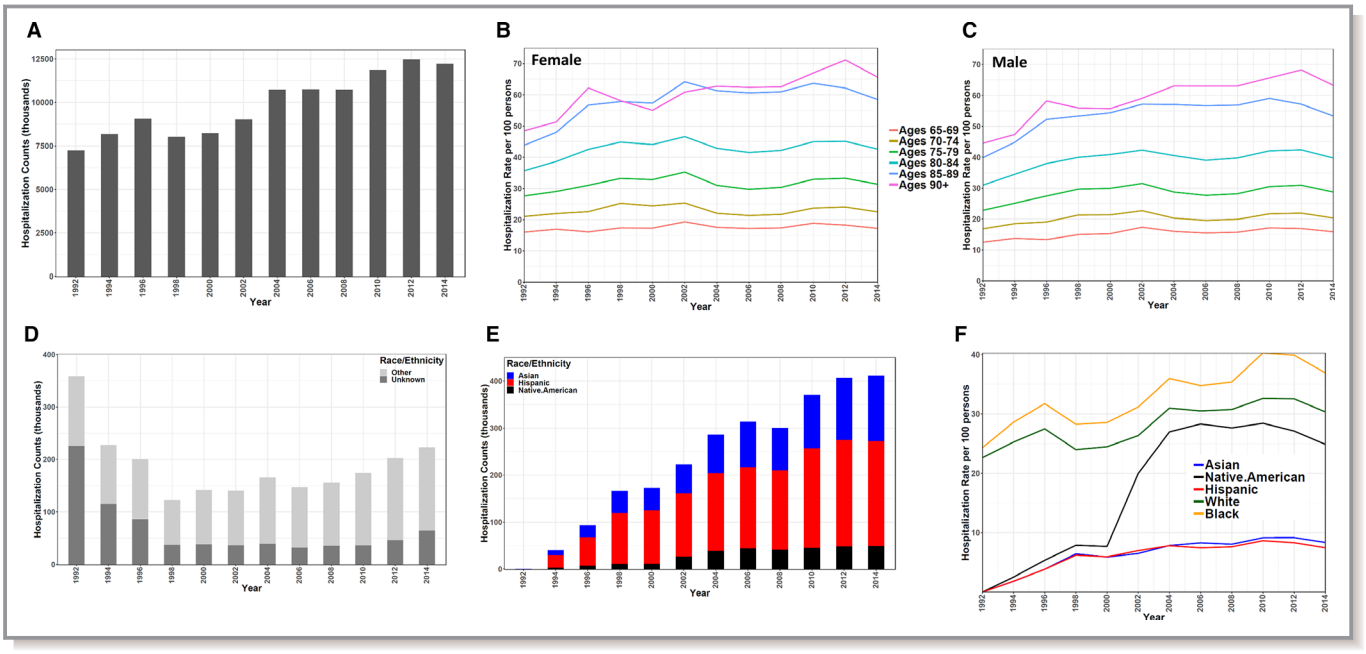



**Figure 1.** CVD hospitalization counts and rates among older Americans 1992 to 2014, overall, by sex/age by race/ethnicity: **A**, Total CVD hospitalization counts. **B**, Female CVD hospitalization rates by 5-year age category. **C,** Male CVD hospitalization rates by 5-year age category. **D**, CVD hospitalization counts categorized as "other" or "unknown" race/ethnicity. **E**, CVD hospitalization counts for Native Americans, Asians, and Hispanics. **F**, CVD hospitalization rates by race/ethnicity. Data source: US Centers for Medicare & Medicaid Services and US Census. CVD indicates cardiovascular disease.

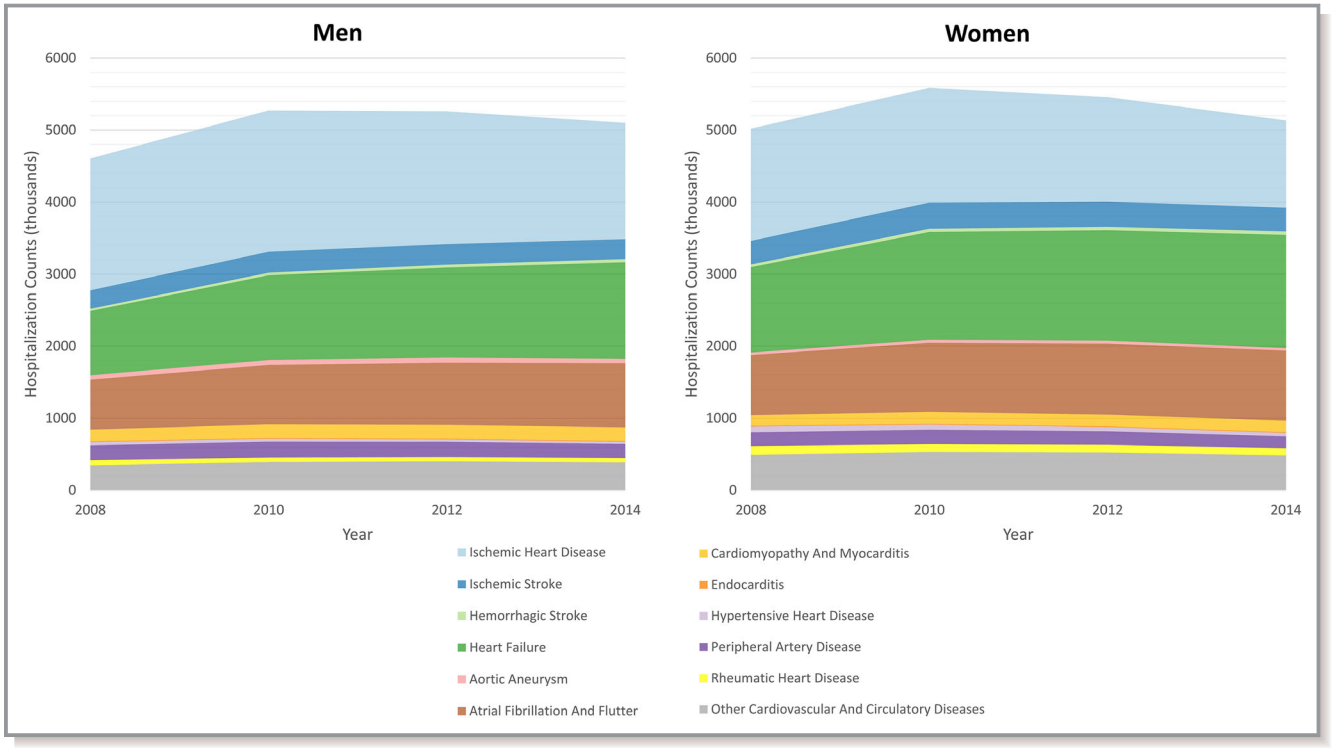
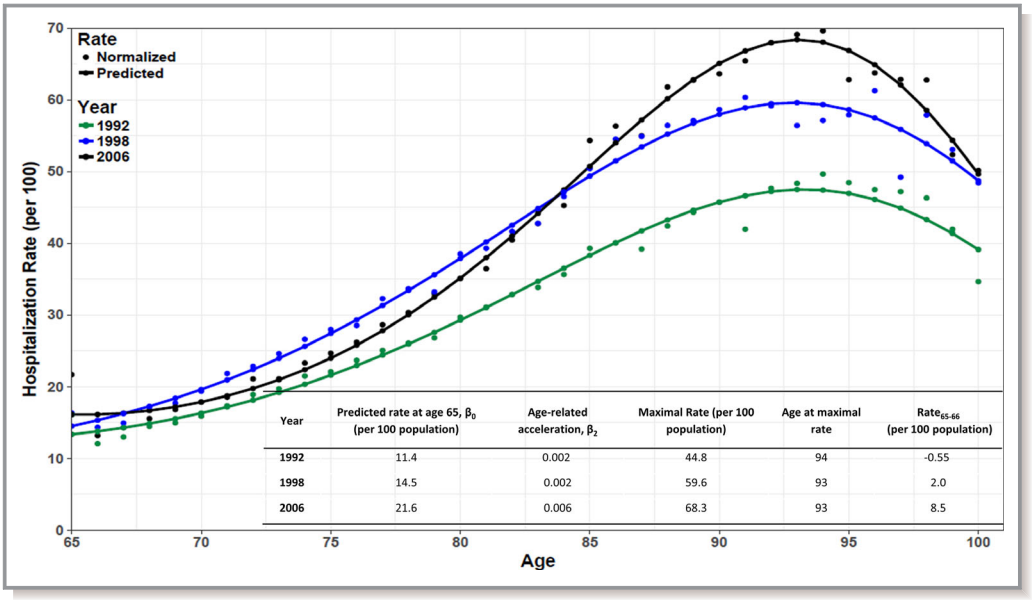



**Figure 2.** Trends 2008 to 2014 in cardiovascular disease–related hospitalizations among older Americans by subtype. Data source: US Centers for Medicare & Medicaid Services and US Census.

Deviations between actual hospitalization rates and those predicted by the cubic polynomial function were minimal in the overall US elderly population, and were most apparent at age 65 years, as indicated in differences between the points (actual rates) and curves (predicted rates) in Figure 3, and adjacent year-specific heatmap columns in Figure 4. The higher-than-predicted rates of CVD-related hospitalization at age 65 years, indicated by the orange points in Figure S1, are because of high rates of healthcare utilization by previously uninsured individuals at the onset of Medicare eligibility at age 65 years. The difference between the hospitalization rates at ages 65 and 66 years across the entire US elderly population represents the magnitude of the Medicare onset spike at age 65 years. The change from no onset spike in 1991 to a difference of 8.47 CVD hospitalizations per 100 people in 2006 suggests sharp increases in elderly requiring CVD-related health care at Medicare eligibility onset (Figure 3). Acceleration in age-related hospitalization rates in the elderly was evident from 1991 to 2006, indicated by increases in the quadratic coefficient of the polynomial regression, which tripled for women and increased 6-fold for men during this time period (Table S3).

Analysis of time trends by single-year of age (Figure 4) presents significantly greater insights into age patterns in cardiovascular hospitalizations in comparison to analysis by broad 5-year age category (Figure 1), highlighting the importance of accessible, detailed data from CMS. Between 1991 and 2006, CVD hospitalization rates increased for each single-year age group (Figure 4). For example, age-specific CVD-related hospitalization rates in men increased 32% to 40% over time: rates in men aged 65 years increased from 13.0 per 100 people in 1991 to 17.2 per 100 in 2006; at age 85 years, rates increased from 39.8 per 100 in 1991 to 53.0 per 100 in 2006, and at age 95 rates increased from 47.5 per 100 to 66.5 per 100. Though overall age-specific rates were lower for women than for men, trends over time were similar, with rates for women increasing by 52% from 10.0 per 100 people in 1991 to 15.2 per 100 in 2006 at age 65 years; for women aged 85 years, rates increased by 41% from 35.1 to 49.5 per 100; and at age 95 years, rates among women increased by 53% from 43.9 to 67.1 per 100 (Table S3, Figure 4). Birth-cohort effects were evident for the population born in 1901 (participants aged 90 in 1991), which displayed hospitalization rates lower than predicted, with this effect persisting through the ninth decade of life for both men and women in this cohort (Figure 4).

Given evidence of misclassification of race/ethnicity in CMS data, particularly for groups other than whites and blacks through the 1990s, relevant comparison of trends by race/ethnicity can only be made for the period following 2001. Over the 6-year period 2001 to 2006, for which CMS data were available by single-year of age enabling detailed




| Year | Predicted rate at age 65, $\beta_0$ (per 100 population) | Age-related acceleration, $\beta_2$ | Maximal Rate (per 100 population) | Age at maximal rate | $Rate_{65-66}$ (per 100 population) |
|---|---|---|---|---|---|
| 1992 | 11.4 | 0.002 | 44.8 | 94 | -0.55 |
| 1998 | 14.5 | 0.002 | 59.6 | 93 | 2.0 |
| 2006 | 21.6 | 0.006 | 68.3 | 93 | 8.5 |

**Figure 3.** Distributions of cardiovascular disease–related hospitalization rates per 100 adults, by single year of age and calendar year between 1992 and 2006 in US adults aged ≥65 years, based on data from the US Centers for Medicare & Medicaid Services and the US Census. Actual year-specific hospitalization rates are shown as points; rates predicted by third-degree polynomial regression are shown as curves. The polynomial is specified as: $\ln(rate_{aij})=\beta_0+\beta_1(a_{ij})+\beta_2(a_{ij})^2+\beta_3(a_{ij})^3$, which specifies the single-year age distribution of $\log_e$-transformed hospitalization rates for *a* – year of age (a=65–99), for i – calendar year (i=1992, 1998, 2006).

analysis of changes in single-year age distributions, maximal CVD hospitalization rates in the elderly population per 100 people increased by 239%, from 17.3 to 58.7 among Native American men and by 264%, from 17.8 to 64.8, in Native American women (Figure S2). It is important to note, however, that this dramatic increase over a 6-year period is likely, in part, to be related to annual improvements in the coding of race/ethnicity of Native American Medicare beneficiaries.[29] Between 2001 and 2006, smaller increases in rates were noted among Hispanic men and women (from 14.5 to 22.3 [54%], and from 14.2 to 23.2 [63%], respectively). Increases in CVD hospitalization rates among Asian men and women were similarly modest, with changes of 51% from 19.9 to 30.1 per 100 men, and 68%, from 15.6 to 26.2 per 100 women during this period. For black men and women, the maximal rate increased from 57.0 to 70.4 (24%), and 60.7 to 77.3 (27%), per 100 people, respectively. For whites, rates increased by 32% (55.6 to 73.5 per 100) and 38% (50.1 to 69.3 per 100) for men and women, respectively, between 2001 and 2006. The age at which the maximum CVD hospitalization rate was observed among older adults increased modestly for most race categories between 2001 and 2006, from 88 to 91 for Native American men, 88 to 92 for Native American women, 89 to 90 for Asian men and women, 87 to 90 for Hispanic men, 88 to 90 for Hispanic women; 91 to 92 for black men, 92 to 93 for black women; and held constant at 92 for white men and 93 for white women (Table S3, Figure S2).

At age 65 years, the rates for Native Americans from 2001 to 2006 increased steeply from 4.2 to 18.5 CVD hospitalizations per 100 men and 5.0 to 19.7 per 100 women (Table S3, Figure S2), which, as stated previously, could be partially related to improvements in race/ethnicity coding by CMS. Among Asians and Hispanics, rates per 100 people increased more modestly from 2001 to 2006: from 1.5 to 3.9 per Asian men; 1.06 to 3.5 for Asian women, 1.9 to 3.0 for Hispanic men, and 1.4 to 2.6 for Hispanic women. In part because of more accurate collection of records on race among blacks and whites, overall hospitalization rates at age 65 years were higher among blacks and whites, with rates increasing by ≈1.2-fold: 22.2 to 28.5 per 100 black men, 23.2 to 27.5 per 100 black women, 14.1 to 17.3 per 100 white men, and 12.0 to 14.8 per 100 white women. Additionally, the increases in Medicare onset spike at age 65 years are particularly pronounced for black and Native American men and women (Figure 5, Table S3), emphasizing the sharp increases in the elderly among these populations who require CVD-related health care at the onset of Medicare eligibility. The coefficient of the quadratic term of the third-degree polynomial indicates shifts from deceleration to acceleration in age-related CVD hospitalization rates from 2001 to 2006 among Native American, Asian, and Hispanic men and women (Table S3, Figure S2). During this period, accelerations increased roughly 3-fold for black men, black women, and white women, and 11-fold for white men.

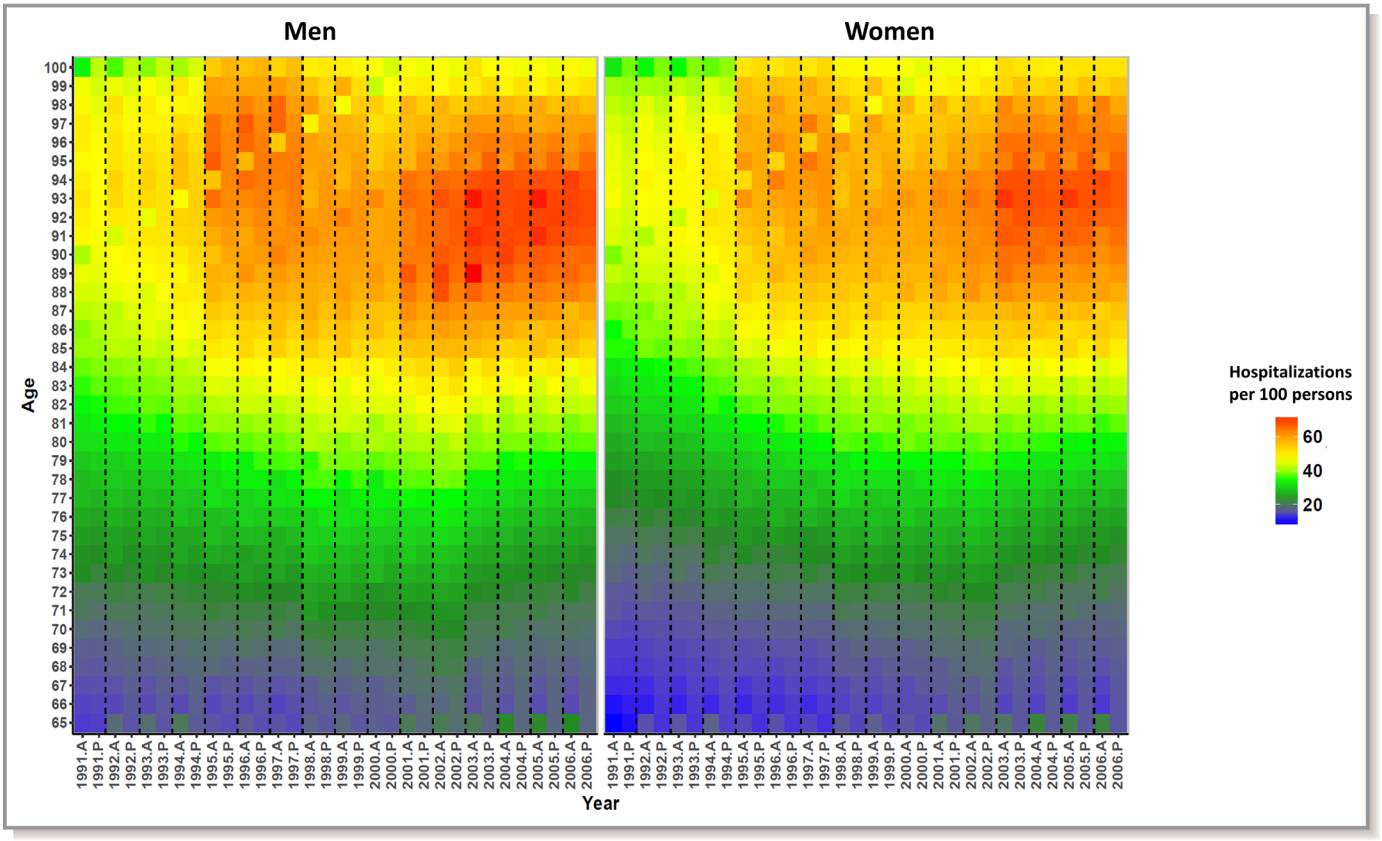



**Figure 4.** Actual and predicted cardiovascular disease–related hospitalization rates in US adults aged ≥65 years by single year of age and calendar year 1991 to 2006 for men **(left)** and women **(right)**. Actual hospitalization rates were calculated by dividing age- and sex-specific cardiovascular disease hospitalization counts collected by the US Centers for Medicare & Medicaid Services by corresponding population counts from the US Census and are denoted in columns with an "A"; columns displaying hospitalization rates predicted using a third-degree polynomial function are denoted with a "P." Actual and predicted rates for each calendar year are shown adjacent to one another.

## National Trends by Year, Sex, and Geographic Region 1991 to 2014

Overall, rates of CVD-related hospitalizations among the elderly increased in all US states between 1991 and 2014, in part because of population aging during the time period, with evidence of pronounced heterogeneity in rates by geographic region (Figure 6). On average, rates were highest in Southern states over the 24-year time period for both men and women. Florida presents a notable exception to this trend, with much lower rates of CVD-related hospitalizations than other Southern states, despite its large elderly population, likely related to the "snowbird" phenomenon in which a large portion of the elderly population in Florida have their medical claims administered in their home states.[30] CVD-related hospitalization rates were lowest in the Western states, though the particularly low rates in Hawaii should be interpreted with caution because of the comparatively small population of older adults in that state.

The age at which the peak number of hospitalizations occurred was typically lower in men than in women and varied over time as well as by geographic region (Figure 7). Averaged over the 24-year time period, South Dakota had the oldest peak age among men, and Rhode Island had the oldest among women; Alaska had the youngest peak age for both men and women, potentially reflecting the younger age-structure of the population in that state. At the national level, the age at which the peak number of CVD hospitalizations occurred in elderly men increased over time from age 70 years in 1992 to age 75 years in 2014. The largest increase in the peak age of CVD hospitalizations among men occurred in California, with increases of 13 years in age between 1991 and 2014. In Nevada, older men had a decline of 5 years in peak age, the largest decline among all states. Among older women in the United States, peak age of CVD hospitalization increased from age 77 years in 1991 to 80 years in 2014. Older women in Wyoming experienced the largest decrease in peak age between 1991 and 2014, 6 years; whereas the greatest increases in peak age over time in this population, 11 years, occurred in Delaware, South Carolina, and Nevada.

## Discussion

This analysis of trends in CVD hospitalizations rates in the US elderly population by age, calendar year, and race, based on

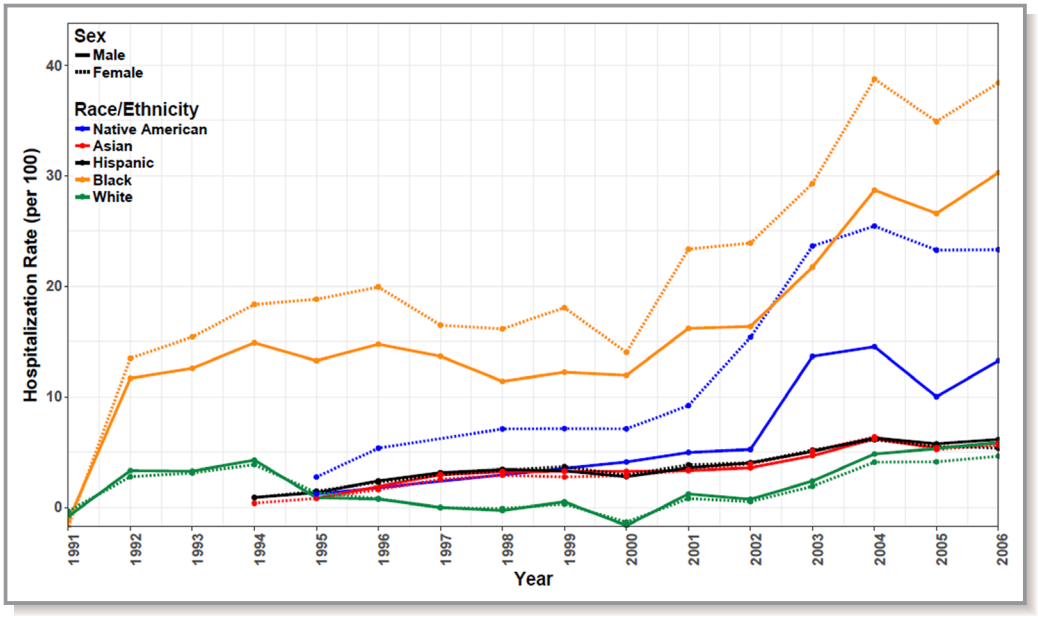



**Figure 5.** Calculated difference in predicted cardiovascular disease (CVD)–related hospitalization rates at age 65 and 66 years by race/ethnicity, sex, and calendar year. This difference in rates potentially reveals the number of people who did not have access to health care before age 65 years and subsequently sought care at the age of Medicare eligibility, resulting in a larger CVD-related hospitalization rate at age 65 than at age 66 years.

over 181 million hospitalization records from CMS from 1991 to 2014 revealed increases in both CVD hospitalization rates by age for men and women, and in peak age of hospitalization rates and counts. Acceleration in hospitalization rates with age was also apparent in the entire US elderly population, as well by race/ethnic subgroup. We further found notable underreporting/misclassification by race, resulting in significant underestimation of CVD hospitalization rates in Native Americans, Asians, and Hispanics in the 1990s. Together, these results provide the most comprehensive characterization thus far of trends in CVD hospitalization burdens in the US elderly population over a 24-year period.

Several factors could contribute to the observed increases in CVD burden among the elderly over the 24-year study period. Age-specific mortality rates for CVD in the United States have been declining for the past half-century (with recent exception[31]), and improved survival after CVD events, longer life expectancy, and overall aging of the population, in combination, have led to increases in the number of elderly people living with existing CVD, as observed in other high-income countries.[32] Changes in the organization and financing of health care over time, and the implementation of national healthcare policies may have affected access to care, and thus also contributed to these trends.[33]

Examination of single-year age distributions of CVD hospitalizations over time reveals several interesting trends. First, the magnitude of the difference between rates at ages 65 and 66 years potentially reveals the number of people who did not have access to health care before age 65 years and subsequently sought care at the age of Medicare eligibility. This phenomenon has been described in other studies looking at the impact of Medicare eligibility on utilization of basic clinical services,[34] breast cancer screening,[35] and overall hospital admissions,[36,37] but none have yet investigated this trend specifically for CVD. Our findings indicate that deferral of healthcare utilization until the age of Medicare eligibility has increased over time during the period for which we were able to estimate trends by single-year or age, both in the overall elderly population, but particularly so among blacks and Hispanics, and reasons for this increase, such as diminished access to health insurance and health care before Medicare eligibility, require further investigation. Second, steeper reductions in CVD hospitalization rates in the ninth decade of life between 1991 and 2006 reveal the impact of reductions in age-specific CVD mortality rates over time,[1] and also suggest survival of the most robust segment of the population into very old age. Third, upward shifts in the single-year age distributions in the overall population, as well as by race/ethnicity, reveal increases in age-specific hospitalization rates among all US elderly, which potentially reflects an aging population that is living longer with CVD burdens, and bears significant implications for future increases in healthcare costs.[38]

The issue of misclassification of race/ethnicity has been identified in multiple large population-based data sets in the United States.[39–45] Our findings of high levels of underreporting

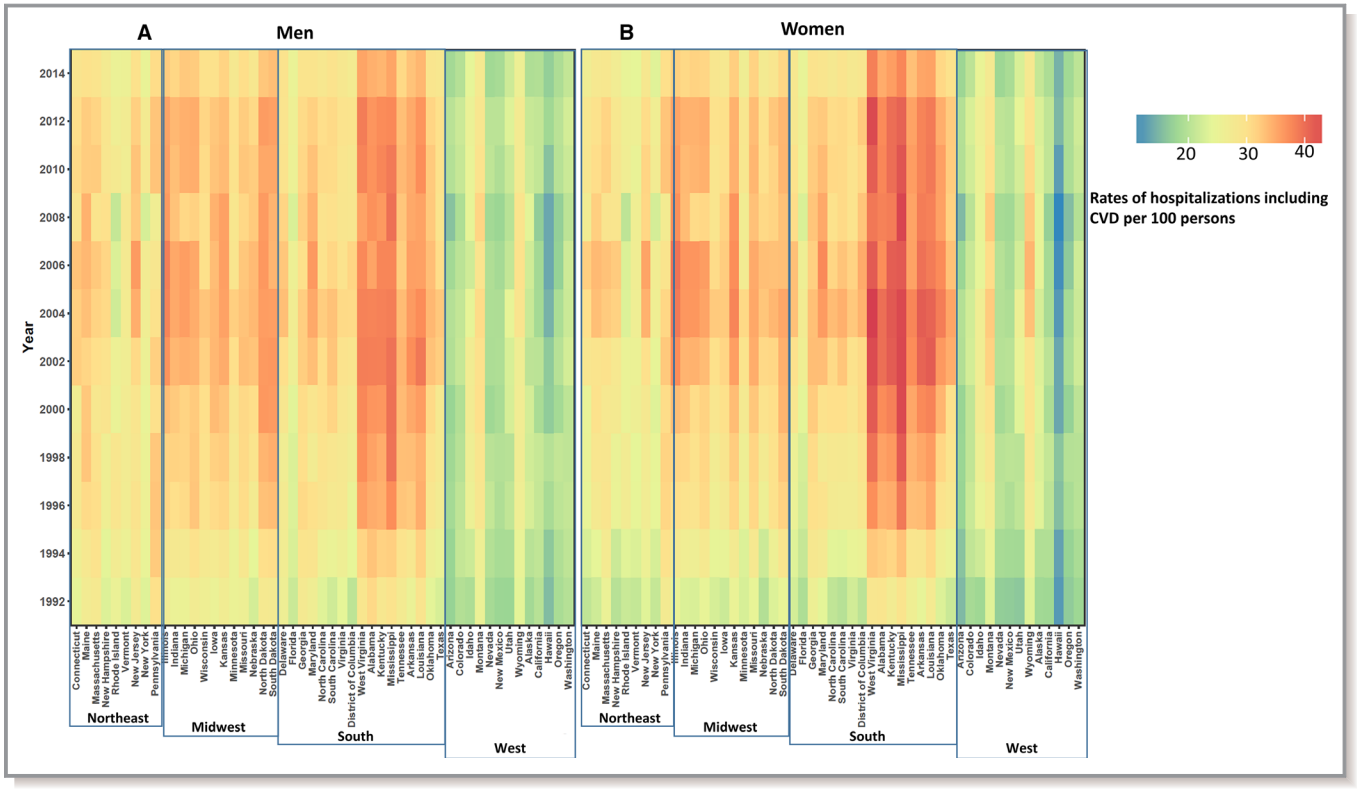



**Figure 6.** Cardiovascular disease–related hospitalization rate by state and year for (**A**) men, and (**B**) women. Heatmaps indicate the overall hospitalization rate among the US elderly by state and year from 1992 to 2014. Data source: US Centers for Medicare & Medicaid Services and US Census.

leading to misclassification of race for Native Americans, Asians, and Hispanics, particularly in the 1990s, merit attention, since such misclassification leads to great underestimation of disease rates in these populations. Misclassification of race/ethnicity in CMS data in the 1990s can be traced to an overly simplistic race coding scheme used by the US Social Security Administration, from which CMS receives information on race/ethnicity of participants. Until 1980, the US Social Security Administration allowed classification of an applicant's race/ethnicity into only 3 categories, "White," "Black," and "Other"; the "Unknown" category was used for people who did not report a race category in their US Social Security Administration application.[46,47] Since most individuals in our sample obtained a social security number before 1980, their racial/ethnic identifiers were limited to those 4 categories. These categories were expanded in US Social Security Administration files in 1980, replacing "Other" with Hispanic, Asian/Pacific Islander, and American Indian, and the records were updated in the Medicare Enrollment Database in 1994. In 1997, CMS surveyed beneficiaries with Spanish surnames and those with "other" or "unknown" race/ethnicity to collect race/ethnicity data, further improving the quality of the race/ethnicity reporting. However, more recent assessments of the data show that issues of misclassification persist.[48] Our analyses suggest that improving current methods of race/ethnicity reporting is essential in population surveillance and that care should be taken to identify and adjust for misclassification when utilizing existing population-based records for estimating disease burdens in minority populations,[49,50] which is a crucial step in identifying and remedying health disparities. In estimating CVD hospitalization rates by race, we noted particularly high rates of increase in Native American and Hispanic populations, which could be because of both improvements in collection of data on race over time, as well as actual increases in number of CVD hospitalizations in these groups, consistent with CVD mortality estimates in other studies.[43,45] We also noted that the peak age of hospitalization in Native Americans and Hispanics is lower than in blacks or whites, consistent with findings that Native American and Hispanic populations develop cardiovascular disease at younger ages than the overall population.[51,52] Though Asians showed more moderate rates of increase and higher peak ages of hospitalization than did other minority groups, this could mask heterogeneity within the Asian population in the US elderly, given marked distinctions in CVD epidemiology between East Asian–origin and South Asian–origin populations.[53]

This study has several strengths. Our analyses are based on a data collection structure with uniform nationwide

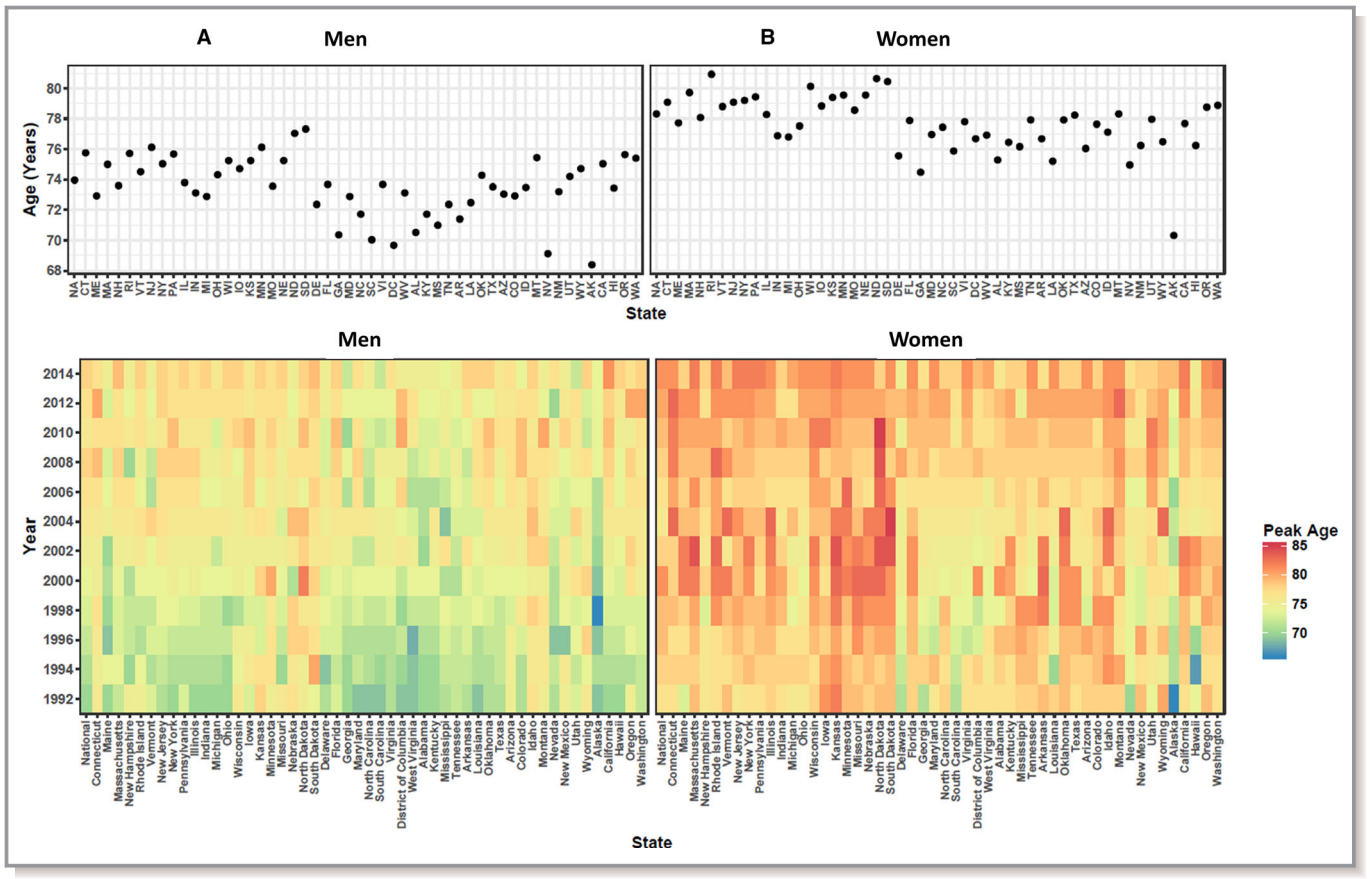



**Figure 7.** Age at which maximum cardiovascular disease (CVD)–related hospitalization rates were observed by state and year for (**A**) men, and (**B**) women. Heatmaps indicate the age at which the highest rate of CVD-related hospitalizations was observed by year and state among the US elderly from 1992 to 2014. The top panel indicates the average peak age by state across the entire time period. Data source: US Centers for Medicare & Medicaid Services and US Census.

coverage of the US population aged 65 years and above, providing the most comprehensive available records with which to analyze trends in CVD hospitalization rates; these data also span 24 years, which allows for assessment of long-term trends in CVD-related hospitalizations in the US elderly. Furthermore, the modeling approach we used provides a high degree of fit to the hospitalization data with only small deviations between actual and predicted rates and generates interpretable coefficients. The polynomial model developed in this analysis allows comparable and quantitative description of age-related trends across race/ethnicity groups and over time (for example, age-related acceleration and deceleration in hospitalization rates). Additionally, fitting of the model reduces variability in the raw age-specific data and therefore allows for more accurate identification of age-related features of the data, such as peak age. Importantly, in this analysis we have examined distributions of CVD rates by single year of age in the elderly population over a 15-year period, providing granular insight into age-related trends. This detailed look at trends by single year of age is particularly important because it highlights 2 findings that have not previously been characterized in depth for CVD-related hospitalization and merit further investigation: first, the increasingly large difference in rates between ages 65 and 66 years, indicating larger hospitalization burdens at age 65 years and suggesting larger populations without access to medical care before the age of Medicare eligibility; and second, the downturn in rates among the oldest old, which could be relevant to survival of the heathiest among the very aged, or conversely, increased institutionalization in this population.

Some limitations should be considered. In tabulating hospital counts by race, we noted a large portion of records stating “other” or “unknown” as race categories, reflecting misclassification of hospitalizations in Native Americans, Asians, and Hispanics in the 1990s in the CMS population, which could lead to underestimation of CVD hospitalization rates in these groups if correction is not performed. However, we base our analyses of race on data from 2001 to 2006, by which time misclassification of race in these records have been substantially reduced and stabilized to some extent. Additionally, the race/ethnicity categories of “Asian” and “Hispanic” are very broad and could mask considerable

heterogeneity in CVD hospitalization rates within these populations, since each group consists of multiple ethnicities and national origins, which have been shown to have heterogeneous CVD risk factors and characteristics.[52] The CMS data used in the present analysis span the time period 1991 to 2014, but data by single-year of age were available only for 1991 to 2006 (subsequent years were provided by CMS in 5-year aggregate age categories), precluding analysis of detailed age trends over the entire 24-year period. This limitation highlights the need for granular examination of age trends among older Americans, which can reveal policy-relevant features, such as the spike in CVD hospitalizations at the age of Medicare onset that is noted in the present analysis. Such detailed analyses require the accessible and affordable provision of reliable refined age-structure data by large administrative databases, such as CMS. Because of differences in batch data preparation by CMS from different time periods, the hospitalization counts in the original data set for 1998 to 2002 were significantly lower than other years, and years 2003 to 2004 were found to be of lesser data quality; however, we normalized these data with the remaining years of CMS data in this analysis using methods that retained the integrity of age- and time-trends in the original data. The presented analysis focuses on all CVD-related hospitalizations to establish age-specific trends in total CVD burdens among the elderly and does not discuss trends by CVD subtype in great detail—future analyses will investigate this, including whether hospitalizations are primarily because of chronic conditions, such as congestive heart failure or atrial fibrillation, or acute conditions, such as myocardial infarction/acute coronary syndrome; how improvements in diagnosis, such as cardiac troponin testing, have impacted rates of CVD hospitalization, and how rates of unstable angina versus myocardial infarction have changed over time. In the present analysis, to assess total CVD hospitalization burdens, we computed CVD-related hospitalization rates using all hospitalization counts per calendar year and for all 10 reported diagnostic codes; future analyses could be conducted to evaluate readmission rates, rates of comorbid conditions, and the position of CVD among all 10 reported diagnostic codes over time to provide insight into billing practices such as upcoding. As with any observation of past trends in healthcare service utilization, it is important to note that changes in national and state healthcare policies likely influenced these trends, and that policies implemented in the future may impact the accuracy of projections based on these data. Future research should explore these trends at a more localized level, such as by county or zip code, and explore factors at those levels that may be associated with differences in hospitalization rates.

In this analysis, we have explored patterns in CVD-related hospitalization in the US elderly by age, race, sex, and geographic region using records maintained by the CMS intending to provide a uniform nationwide coverage for the US population aged 65 years and over. Results from this analysis reveal emerging trends, such as increases in age-specific CVD hospitalization rates over time and increases in the age at which peak hospitalization rates occur, suggesting greater burdens developing at older ages, as well as disproportionately high rates in Native American populations, which increased over the latter part of the analysis period. Our analysis indicates that improving reporting by race/ethnicity in large population-based data sets is crucial to accurate and equitable surveillance of disease burdens in diverse populations in the United States. Furthermore, our results provide evidence to support key recommendations of the American Heart Association by highlighting the critical importance of primary prevention of CVD at younger ages in order to avert increasing CVD burdens among the US elderly, by emphasizing the need for development of effective policies and health management systems to address regional and demographic heterogeneity in CVD burdens, and by underscoring the great necessity for preserving access to affordable health care to mitigate existing CVD burdens and extend years of healthy, active life.

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## Disclosures

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# SUPPLEMENTAL MATERIAL

**Table S1. ICD-9 codes utilized for extracting records on CVD hospitalizations from CMS data.**

| Diagnostic group | ICD-9 code |
|---|---|
| Rheumatic heart disease | 391-391.9, 392.0, 393-398.99 |
| Ischemic heart disease | 410-414.9, V17.3 |
| Ischemic stroke | 433-435.9, 437.0-437.2, 437.4-437.9 |
| Hemorrhagic stroke | 430-432.9, 437.3 |
| Hypertensive heart disease | 402-402.91 |
| Cardiomyopathy and myocarditis | 074.2, 074.23, 422-422.99, 425-425.5, 425.7-425.9, 429.0-429.1 |
| Atrial fibrillation and flutter | 427.3-427.32 |
| Peripheral artery disease | 440.2-440.29, 440.4-440.9, 443-443.9 |
| Endocarditis | 074.22, 421-421.9, 424, 424.4-424.99 |
| Aortic aneurysm | 441 |
| Other cardiovascular and circulatory diseases | 074.21, 417-417.9, 420-420.99, 423-423.9, 424.0-424.3, 429, 429.2-429.9, 442-442.9, 447-454.9, 456, 456.3-457, 457.1, 457.8-458.1, 459-459.9 |

**Table S2. Model performance based on second or third degree polynomial fits of CVD-related hospitalization rates in the US elderly population.**

| Year | Variance Explained % | | |
|---|---|---|---|
| | Model with linear and squared terms | Model with linear and cubed terms | Model with linear, squared, and cubed terms |
| 1991 | 97.836 | 98.636 | 98.922 |
| 1992 | 95.888 | 97.139 | 98.298 |
| 1993 | 95.781 | 97.123 | 98.355 |
| 1994 | 95.242 | 96.717 | 98.051 |
| 1995 | 98.272 | 98.943 | 99.263 |
| 1996 | 97.940 | 98.729 | 99.171 |
| 1997 | 98.117 | 98.893 | 99.214 |
| 1998 | 97.651 | 98.631 | 98.984 |
| 1999 | 97.138 | 98.311 | 98.897 |
| 2000 | 96.939 | 98.417 | 99.240 |
| 2001 | 95.625 | 97.440 | 99.091 |
| 2002 | 95.363 | 97.324 | 99.315 |
| 2003 | 94.734 | 96.501 | 99.117 |
| 2004 | 93.086 | 95.017 | 98.590 |
| 2005 | 93.281 | 95.078 | 98.471 |
| 2006 | 92.977 | 94.725 | 98.169 |

**Table S3. Characteristics of CVD-related hospitalizations in the U.S. elderly population, and regression coefficients describing the relationship between single-year of age and hospitalization rate by year, sex, and race, 1991-2006.**

| Population characteristics | | | Comparison of actual CVD hospitalization rates per 100,000 persons at age 65 and 66 | | | Results and coefficients of third degree polynomial regression model | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total CVD hospitalizations | Total population | Rate at age 65 | Rate at age 66 | Difference in rates at age 65 and 66 | Maximum predicted CVD hospitalization rate per 100,000 persons | Age at maximum rate | β0 | β0_SE | *P* | Predicted hospitalization rate at age 65 per 100,000 persons | β1 | β1_SE | *P* | β2 | β2_SE | *P* | β3 | β3_SE | *P* |
| **Total population, women** | | | | | | | | | | | | | | | | | | | |
| 1991 | 3,836,820 | 18,887,778 | 9,715 | 10,153 | -438 | 44,138 | 94 | -2.34 | 0.035 | 0.000 | 10,088 | 0.048 | 0.008 | 0.000 | 0.0020 | 0.0005 | 0.000 | -6.21E-05 | 8.854E-06 | 0.000 |
| 1992 | 4,161,789 | 19,162,032 | 14,575 | 10,639 | 3,937 | 46,748 | 93 | -2.16 | 0.046 | 0.000 | 11,849 | 0.022 | 0.011 | 0.049 | 0.0034 | 0.0007 | 0.000 | -8.5E-05 | 1.18E-05 | 0.000 |
| 1993 | 4,392,509 | 19,441,260 | 15,196 | 10,839 | 4,357 | 48,282 | 93 | -2.13 | 0.048 | 0.000 | 12,151 | 0.022 | 0.011 | 0.056 | 0.0034 | 0.0007 | 0.000 | -8.73E-05 | 1.238E-05 | 0.000 |
| 1994 | 4,756,569 | 19,644,032 | 16,812 | 11,191 | 5,621 | 50,730 | 93 | -2.07 | 0.052 | 0.000 | 12,922 | 0.023 | 0.012 | 0.070 | 0.0035 | 0.0008 | 0.000 | -8.91E-05 | 1.335E-05 | 0.000 |
| 1995 | 5,071,532 | 19,831,069 | 13,779 | 11,029 | 2,749 | 59,026 | 95 | -2.19 | 0.039 | 0.000 | 11,749 | 0.049 | 0.009 | 0.000 | 0.0021 | 0.0006 | 0.001 | -6.33E-05 | 1.006E-05 | 0.000 |
| 1996 | 5,307,171 | 19,989,574 | 14,485 | 11,546 | 2,939 | 61,158 | 94 | -2.16 | 0.042 | 0.000 | 12,116 | 0.045 | 0.010 | 0.000 | 0.0025 | 0.0006 | 0.000 | -7.17E-05 | 1.07E-05 | 0.000 |
| 1997 | 5,470,696 | 20,100,203 | 13,455 | 11,295 | 2,161 | 62,234 | 94 | -2.19 | 0.039 | 0.000 | 11,772 | 0.053 | 0.009 | 0.000 | 0.0022 | 0.0006 | 0.000 | -6.92E-05 | 1.006E-05 | 0.000 |
| 1998 | 4,651,312 | 20,174,835 | 12,633 | 10,583 | 2,049 | 47,504 | 93 | -2.27 | 0.039 | 0.000 | 10,861 | 0.047 | 0.009 | 0.000 | 0.0022 | 0.0006 | 0.001 | -6.82E-05 | 1E-05 | 0.000 |
| 1999 | 4,711,750 | 20,201,159 | 13,137 | 10,519 | 2,618 | 48,439 | 93 | -2.24 | 0.041 | 0.000 | 11,046 | 0.039 | 0.009 | 0.000 | 0.0027 | 0.0006 | 0.000 | -7.87E-05 | 1.04E-05 | 0.000 |
| 2000 | 4,807,592 | 20,308,785 | 12,336 | 11,524 | 811 | 48,243 | 92 | -2.22 | 0.032 | 0.000 | 11,271 | 0.035 | 0.007 | 0.000 | 0.0031 | 0.0005 | 0.000 | -8.65E-05 | 8.273E-06 | 0.000 |
| 2001 | 5,064,924 | 20,684,289 | 14,995 | 11,481 | 3,513 | 49,961 | 92 | -2.09 | 0.036 | 0.000 | 12,583 | 0.016 | 0.008 | 0.064 | 0.0041 | 0.0005 | 0.000 | -0.000101 | 9.232E-06 | 0.000 |
| 2002 | 5,250,841 | 20,758,208 | 15,469 | 12,149 | 3,320 | 51,375 | 92 | -2.04 | 0.033 | 0.000 | 13,271 | 0.011 | 0.008 | 0.140 | 0.0043 | 0.0005 | 0.000 | -0.000104 | 8.328E-06 | 0.000 |
| 2003 | 6,374,083 | 20,889,334 | 18,827 | 13,615 | 5,211 | 69,255 | 93 | -1.88 | 0.041 | 0.000 | 15,316 | -0.002 | 0.009 | 0.846 | 0.0055 | 0.0006 | 0.000 | -0.000125 | 1.052E-05 | 0.000 |
| 2004 | 6,332,675 | 21,015,689 | 21,114 | 13,281 | 7,833 | 68,488 | 93 | -1.83 | 0.052 | 0.000 | 15,909 | -0.016 | 0.012 | 0.190 | 0.0063 | 0.0007 | 0.000 | -0.000138 | 1.324E-05 | 0.000 |
| 2005 | 6,297,951 | 21,201,859 | 20,576 | 12,684 | 7,892 | 68,777 | 93 | -1.86 | 0.055 | 0.000 | 15,378 | -0.014 | 0.013 | 0.279 | 0.0062 | 0.0008 | 0.000 | -0.000135 | 1.414E-05 | 0.000 |
| 2006 | 6,298,603 | 21,430,862 | 20,951 | 12,352 | 8,599 | 68,087 | 93 | -1.88 | 0.060 | 0.000 | 15,205 | -0.014 | 0.014 | 0.315 | 0.0062 | 0.0009 | 0.000 | -0.000134 | 1.545E-05 | 0.000 |
| **Total population, men** | | | | | | | | | | | | | | | | | | | |
| 1991 | 2,865,228 | 12,744,624 | 12,561 | 13,279 | -718 | 47,740 | 94 | -2.10 | 0.043 | 0.000 | 12,989 | 0.055 | 0.010 | 0.000 | 0.0009 | 0.0006 | 0.148 | -4.16E-05 | 1.107E-05 | 0.001 |
| 1992 | 3,081,216 | 12,980,361 | 17,876 | 13,722 | 4,154 | 50,393 | 93 | -1.92 | 0.048 | 0.000 | 15,062 | 0.026 | 0.011 | 0.024 | 0.0025 | 0.0007 | 0.001 | -6.78E-05 | 1.22E-05 | 0.000 |
| 1993 | 3,210,161 | 13,245,479 | 18,089 | 14,157 | 3,932 | 51,481 | 93 | -1.91 | 0.041 | 0.000 | 15,194 | 0.027 | 0.009 | 0.008 | 0.0026 | 0.0006 | 0.000 | -6.9E-05 | 1.048E-05 | 0.000 |
| 1994 | 3,421,146 | 13,452,746 | 19,589 | 14,138 | 5,451 | 54,143 | 93 | -1.87 | 0.047 | 0.000 | 15,902 | 0.024 | 0.011 | 0.036 | 0.0028 | 0.0007 | 0.000 | -7.42E-05 | 1.2E-05 | 0.000 |
| 1995 | 3,615,211 | 13,676,994 | 15,085 | 13,763 | 1,322 | 63,765 | 95 | -2.01 | 0.034 | 0.000 | 14,176 | 0.051 | 0.008 | 0.000 | 0.0016 | 0.0005 | 0.003 | -5.31E-05 | 8.76E-06 | 0.000 |
| 1996 | 3,756,293 | 13,866,962 | 15,901 | 13,889 | 2,012 | 64,922 | 94 | -1.99 | 0.035 | 0.000 | 14,399 | 0.050 | 0.008 | 0.000 | 0.0018 | 0.0005 | 0.001 | -5.68E-05 | 8.839E-06 | 0.000 |
| 1997 | 3,835,938 | 14,024,104 | 14,874 | 13,338 | 1,536 | 64,918 | 94 | -2.04 | 0.039 | 0.000 | 13,765 | 0.059 | 0.009 | 0.000 | 0.0015 | 0.0006 | 0.013 | -5.46E-05 | 9.948E-06 | 0.000 |
| 1998 | 3,365,403 | 14,158,651 | 13,605 | 12,543 | 1,062 | 49,720 | 93 | -2.14 | 0.039 | 0.000 | 12,473 | 0.058 | 0.009 | 0.000 | 0.0012 | 0.0006 | 0.034 | -5.24E-05 | 9.936E-06 | 0.000 |
| 1999 | 3,391,030 | 14,266,354 | 14,013 | 12,214 | 1,799 | 49,956 | 92 | -2.13 | 0.040 | 0.000 | 12,522 | 0.050 | 0.009 | 0.000 | 0.0018 | 0.0006 | 0.003 | -6.35E-05 | 1.017E-05 | 0.000 |
| 2000 | 3,421,542 | 14,433,599 | 13,168 | 13,278 | -110 | 48,708 | 92 | -2.11 | 0.032 | 0.000 | 12,662 | 0.043 | 0.007 | 0.000 | 0.0023 | 0.0005 | 0.000 | -7.56E-05 | 8.222E-06 | 0.000 |
| 2001 | 3,621,891 | 14,606,002 | 15,980 | 13,186 | 2,794 | 53,294 | 92 | -1.99 | 0.033 | 0.000 | 14,050 | 0.021 | 0.008 | 0.009 | 0.0038 | 0.0005 | 0.000 | -9.96E-05 | 8.515E-06 | 0.000 |
| 2002 | 3,771,400 | 14,763,999 | 16,323 | 13,915 | 2,408 | 55,039 | 92 | -1.93 | 0.031 | 0.000 | 14,726 | 0.014 | 0.007 | 0.065 | 0.0043 | 0.0004 | 0.000 | -0.000109 | 7.994E-06 | 0.000 |
| 2003 | 4,411,911 | 14,974,195 | 19,724 | 15,311 | 4,413 | 70,667 | 92 | -1.78 | 0.039 | 0.000 | 16,851 | -0.003 | 0.009 | 0.761 | 0.0056 | 0.0006 | 0.000 | -0.000131 | 9.961E-06 | 0.000 |
| 2004 | 4,395,011 | 15,187,630 | 22,028 | 14,941 | 7,087 | 69,889 | 92 | -1.73 | 0.046 | 0.000 | 17,541 | -0.020 | 0.011 | 0.069 | 0.0065 | 0.0007 | 0.000 | -0.000146 | 1.183E-05 | 0.000 |
| 2005 | 4,420,704 | 15,447,939 | 21,800 | 14,309 | 7,491 | 70,152 | 92 | -1.75 | 0.048 | 0.000 | 17,140 | -0.022 | 0.011 | 0.058 | 0.0068 | 0.0007 | 0.000 | -0.00015 | 1.232E-05 | 0.000 |
| 2006 | 4,454,556 | 15,733,245 | 22,431 | 14,100 | 8,331 | 69,331 | 92 | -1.74 | 0.053 | 0.000 | 17,194 | -0.025 | 0.012 | 0.051 | 0.0068 | 0.0008 | 0.000 | -0.00015 | 1.351E-05 | 0.000 |
| **Total population, overall** | | | | | | | | | | | | | | | | | | | |
| 1991 | 6,702,048 | 31,632,402 | 11,006 | 11,564 | -558 | 44,837 | 94 | -2.22 | 0.037 | 0.000 | 11,440 | 0.049 | 0.009 | 0.000 | 0.0015 | 0.0005 | 0.006 | -5.36E-05 | 9.44E-06 | 0.000 |
| 1992 | 7,243,005 | 32,142,393 | 16,074 | 12,032 | 4,043 | 47,474 | 93 | -2.04 | 0.045 | 0.000 | 13,331 | 0.022 | 0.010 | 0.039 | 0.0030 | 0.0006 | 0.000 | -7.73E-05 | 1.148E-05 | 0.000 |
| 1993 | 7,602,670 | 32,686,739 | 16,525 | 12,340 | 4,184 | 48,932 | 93 | -2.02 | 0.044 | 0.000 | 13,583 | 0.022 | 0.010 | 0.040 | 0.0031 | 0.0006 | 0.000 | -8.05E-05 | 1.137E-05 | 0.000 |
| 1994 | 8,177,715 | 33,096,778 | 18,087 | 12,539 | 5,548 | 51,432 | 93 | -1.97 | 0.048 | 0.000 | 14,315 | 0.021 | 0.011 | 0.066 | 0.0032 | 0.0007 | 0.000 | -8.38E-05 | 1.234E-05 | 0.000 |
| 1995 | 8,686,743 | 33,508,063 | 14,386 | 12,280 | 2,105 | 59,969 | 95 | -2.10 | 0.035 | 0.000 | 12,873 | 0.050 | 0.008 | 0.000 | 0.0019 | 0.0005 | 0.001 | -5.83E-05 | 8.888E-06 | 0.000 |

| | Population characteristics | | Comparison of actual CVD hospitalization rates per 100,000 persons at age 65 and 66 | | | Results and coefficients of third degree polynomial regression model | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total CVD hospitalizations | Total population | Rate at age 65 | Rate at age 66 | Difference in rates at age 65 and 66 | Maximum predicted CVD hospitalization rate per 100,000 persons | Age at maximum rate | β0 | β0_SE | *P* | Predicted hospitalization rate at age 65 per 100,000 persons | β1 | β1_SE | *P* | β2 | β2_SE | *P* | β3 | β3_SE | *P* |
| 1996 | 9,063,464 | 33,856,536 | 15,138 | 12,632 | 2,506 | 61,899 | 94 | -2.07 | 0.037 | 0.000 | 13,194 | 0.046 | 0.009 | 0.000 | 0.0022 | 0.0005 | 0.000 | -6.56E-05 | 9.512E-06 | 0.000 |
| 1997 | 9,306,634 | 34,124,307 | 14,110 | 12,234 | 1,876 | 62,746 | 94 | -2.12 | 0.037 | 0.000 | 12,718 | 0.054 | 0.009 | 0.000 | 0.0019 | 0.0005 | 0.001 | -6.32E-05 | 9.455E-06 | 0.000 |
| 1998 | 8,016,715 | 34,333,486 | 13,083 | 11,486 | 1,597 | 47,972 | 93 | -2.20 | 0.037 | 0.000 | 11,629 | 0.051 | 0.008 | 0.000 | 0.0017 | 0.0005 | 0.002 | -6.06E-05 | 9.403E-06 | 0.000 |
| 1999 | 8,102,780 | 34,467,513 | 13,544 | 11,301 | 2,243 | 48,730 | 93 | -2.19 | 0.038 | 0.000 | 11,752 | 0.044 | 0.009 | 0.000 | 0.0023 | 0.0006 | 0.000 | -7.12E-05 | 9.782E-06 | 0.000 |
| 2000 | 8,229,134 | 34,742,384 | 12,723 | 12,338 | 385 | 48,326 | 92 | -2.17 | 0.031 | 0.000 | 11,933 | 0.039 | 0.007 | 0.000 | 0.0027 | 0.0004 | 0.000 | -8.04E-05 | 7.936E-06 | 0.000 |
| 2001 | 8,686,815 | 35,290,291 | 15,457 | 12,276 | 3,181 | 50,882 | 92 | -2.04 | 0.034 | 0.000 | 13,268 | 0.019 | 0.008 | 0.021 | 0.0038 | 0.0005 | 0.000 | -9.78E-05 | 8.609E-06 | 0.000 |
| 2002 | 9,022,241 | 35,522,207 | 15,870 | 12,974 | 2,896 | 52,402 | 92 | -1.99 | 0.030 | 0.000 | 13,936 | 0.014 | 0.007 | 0.060 | 0.0041 | 0.0004 | 0.000 | -0.000103 | 7.748E-06 | 0.000 |
| 2003 | 10,785,994 | 35,863,529 | 19,249 | 14,410 | 4,840 | 69,620 | 93 | -1.84 | 0.039 | 0.000 | 16,019 | -0.001 | 0.009 | 0.883 | 0.0054 | 0.0006 | 0.000 | -0.000124 | 9.868E-06 | 0.000 |
| 2004 | 10,727,686 | 36,203,319 | 21,546 | 14,061 | 7,485 | 68,823 | 93 | -1.78 | 0.048 | 0.000 | 16,650 | -0.017 | 0.011 | 0.141 | 0.0063 | 0.0007 | 0.000 | -0.000138 | 1.237E-05 | 0.000 |
| 2005 | 10,718,655 | 36,649,798 | 21,154 | 13,450 | 7,704 | 69,121 | 93 | -1.81 | 0.052 | 0.000 | 16,164 | -0.016 | 0.012 | 0.189 | 0.0063 | 0.0007 | 0.000 | -0.000138 | 1.321E-05 | 0.000 |
| 2006 | 10,753,159 | 37,164,107 | 21,649 | 13,175 | 8,474 | 68,381 | 93 | -1.81 | 0.057 | 0.000 | 16,098 | -0.018 | 0.013 | 0.185 | 0.0063 | 0.0008 | 0.000 | -0.000138 | 1.447E-05 | 0.000 |
| **Native American women** | | | | | | | | | | | | | | | | | | | | |
| 1995 | 4,070 | 77,216 | 5,782 | 3,046 | 2,736 | 5,487 | 77 | -3.12 | 0.202 | 0.000 | 4,548 | 0.036 | 0.047 | 0.443 | -0.0016 | 0.0029 | 0.581 | 1.192E-05 | 5.157E-05 | 0.819 |
| 1996 | 5,768 | 79,691 | 6,570 | 1,224 | 5,347 | 6,095 | 81 | -3.45 | 0.362 | 0.000 | 3,432 | 0.076 | 0.083 | 0.372 | -0.0022 | 0.0052 | 0.671 | 1.649E-06 | 9.254E-05 | 0.986 |
| 1998 | 6,275 | 82,204 | 9,220 | 2,141 | 7,079 | 9,658 | 82 | -3.27 | 0.213 | 0.000 | 4,217 | 0.108 | 0.049 | 0.035 | -0.0033 | 0.0031 | 0.286 | 1.049E-05 | 5.448E-05 | 0.849 |
| 1999 | 6,444 | 84,547 | 8,646 | 1,541 | 7,104 | 10,427 | 81 | -3.69 | 0.251 | 0.000 | 2,992 | 0.185 | 0.058 | 0.003 | -0.0070 | 0.0036 | 0.062 | 6.297E-05 | 6.419E-05 | 0.334 |
| 2000 | 6,664 | 87,125 | 9,414 | 2,326 | 7,088 | 10,355 | 81 | -3.68 | 0.295 | 0.000 | 2,995 | 0.175 | 0.068 | 0.015 | -0.0061 | 0.0042 | 0.164 | 3.745E-05 | 7.555E-05 | 0.623 |
| 2001 | 7,387 | 74,966 | 12,859 | 3,662 | 9,197 | 17,766 | 88 | -3.04 | 0.229 | 0.000 | 5,013 | 0.042 | 0.053 | 0.434 | 0.0032 | 0.0033 | 0.344 | -0.00011 | 5.866E-05 | 0.070 |
| 2002 | 15,895 | 76,979 | 25,218 | 9,845 | 15,373 | 39,240 | 90 | -1.91 | 0.159 | 0.000 | 14,433 | -0.031 | 0.037 | 0.411 | 0.0066 | 0.0023 | 0.007 | -0.000154 | 4.062E-05 | 0.001 |
| 2003 | 22,363 | 79,248 | 34,370 | 10,746 | 23,624 | 57,146 | 92 | -1.67 | 0.154 | 0.000 | 18,659 | -0.012 | 0.036 | 0.736 | 0.0051 | 0.0022 | 0.027 | -0.000117 | 3.943E-05 | 0.005 |
| 2004 | 23,451 | 81,659 | 40,857 | 15,431 | 25,426 | 57,061 | 92 | -1.44 | 0.124 | 0.000 | 22,468 | -0.058 | 0.029 | 0.053 | 0.0076 | 0.0018 | 0.000 | -0.000157 | 3.182E-05 | 0.000 |
| 2005 | 24,860 | 84,419 | 36,916 | 13,657 | 23,260 | 63,621 | 91 | -1.53 | 0.133 | 0.000 | 20,775 | -0.048 | 0.031 | 0.130 | 0.0078 | 0.0019 | 0.000 | -0.000169 | 3.411E-05 | 0.000 |
| 2006 | 26,256 | 87,272 | 36,544 | 13,245 | 23,299 | 64,810 | 92 | -1.61 | 0.140 | 0.000 | 19,674 | -0.022 | 0.032 | 0.494 | 0.0062 | 0.0020 | 0.004 | -0.00014 | 3.581E-05 | 0.000 |
| **Native American men** | | | | | | | | | | | | | | | | | | | | |
| 1995 | 4,980 | 61,765 | 4,610 | 3,419 | 1,190 | 6,650 | 78 | -3.35 | 0.327 | 0.000 | 3,909 | 0.110 | 0.075 | 0.155 | -0.0058 | 0.0047 | 0.223 | 8.805E-05 | 8.367E-05 | 0.301 |
| 2000 | 4,960 | 63,687 | 7,320 | 3,227 | 4,093 | 11,002 | 83 | -3.59 | 0.324 | 0.000 | 3,244 | 0.168 | 0.075 | 0.031 | -0.0061 | 0.0047 | 0.200 | 5.643E-05 | 8.279E-05 | 0.500 |
| 2001 | 5,561 | 56,387 | 9,089 | 4,123 | 4,966 | 17,276 | 87 | -3.31 | 0.230 | 0.000 | 4,191 | 0.146 | 0.053 | 0.010 | -0.0039 | 0.0033 | 0.252 | 1.955E-05 | 5.882E-05 | 0.742 |
| 2002 | 11,158 | 58,444 | 16,802 | 11,574 | 5,229 | 36,103 | 94 | -2.25 | 0.169 | 0.000 | 11,382 | 0.074 | 0.039 | 0.068 | -0.0009 | 0.0024 | 0.727 | -7.88E-06 | 4.324E-05 | 0.857 |
| 2003 | 14,967 | 60,767 | 23,974 | 10,324 | 13,651 | 51,867 | 92 | -2.03 | 0.177 | 0.000 | 13,936 | 0.062 | 0.041 | 0.139 | 0.0008 | 0.0025 | 0.752 | -4.5E-05 | 4.52E-05 | 0.327 |
| 2004 | 15,597 | 63,150 | 27,865 | 13,335 | 14,530 | 50,755 | 91 | -1.78 | 0.192 | 0.000 | 16,902 | 0.002 | 0.044 | 0.971 | 0.0045 | 0.0028 | 0.114 | -0.000113 | 4.925E-05 | 0.029 |
| 2005 | 16,695 | 65,919 | 25,739 | 15,749 | 9,990 | 53,739 | 90 | -1.76 | 0.222 | 0.000 | 17,128 | -0.006 | 0.051 | 0.915 | 0.0055 | 0.0032 | 0.098 | -0.000137 | 5.691E-05 | 0.022 |
| 2006 | 17,857 | 68,608 | 27,417 | 14,157 | 13,260 | 58,748 | 89 | -1.65 | 0.234 | 0.000 | 18,485 | -0.050 | 0.054 | 0.366 | 0.0095 | 0.0034 | 0.008 | -0.000231 | 6.001E-05 | 0.001 |
| **Native American, overall** | | | | | | | | | | | | | | | | | | | | |
| 1994 | 7,016 | 129,407 | 3,565 | 2,487 | 1,078 | 3,188 | 93 | -3.52 | 0.269 | 0.000 | 2,776 | -0.067 | 0.062 | 0.290 | 0.0049 | 0.0039 | 0.214 | -8.66E-05 | 6.88E-05 | 0.217 |
| 1995 | 7,180 | 133,698 | 5,239 | 3,216 | 2,023 | 5,980 | 78 | -3.21 | 0.209 | 0.000 | 4,292 | 0.064 | 0.048 | 0.190 | -0.0031 | 0.0030 | 0.306 | 3.748E-05 | 5.337E-05 | 0.488 |
| 1996 | 10,260 | 137,977 | 5,947 | 1,482 | 4,465 | 6,481 | 83 | -3.35 | 0.343 | 0.000 | 3,699 | 0.053 | 0.079 | 0.506 | -0.0005 | 0.0049 | 0.917 | -3.08E-05 | 8.779E-05 | 0.728 |
| 1998 | 11,224 | 142,233 | 9,028 | 2,399 | 6,629 | 10,375 | 84 | -3.12 | 0.208 | 0.000 | 4,742 | 0.073 | 0.048 | 0.136 | -0.0008 | 0.0030 | 0.781 | -3.44E-05 | 5.318E-05 | 0.522 |
| 1999 | 11,424 | 146,312 | 8,363 | 2,052 | 6,310 | 10,879 | 83 | -3.44 | 0.209 | 0.000 | 3,626 | 0.129 | 0.048 | 0.012 | -0.0033 | 0.0030 | 0.278 | -3.11E-06 | 5.36E-05 | 0.954 |
| 2000 | 11,624 | 150,812 | 8,454 | 2,731 | 5,723 | 10,607 | 82 | -3.61 | 0.240 | 0.000 | 3,178 | 0.165 | 0.055 | 0.006 | -0.0056 | 0.0035 | 0.114 | 3.747E-05 | 6.151E-05 | 0.547 |
| 2001 | 12,948 | 131,353 | 11,075 | 3,876 | 7,198 | 17,833 | 88 | -3.12 | 0.188 | 0.000 | 4,756 | 0.077 | 0.043 | 0.084 | 0.0008 | 0.0027 | 0.768 | -6.64E-05 | 4.799E-05 | 0.176 |
| 2002 | 27,053 | 135,423 | 21,178 | 10,657 | 10,521 | 38,126 | 91 | -2.04 | 0.100 | 0.000 | 13,206 | 0.009 | 0.023 | 0.707 | 0.0038 | 0.0014 | 0.012 | -9.81E-05 | 2.548E-05 | 0.001 |

| | Population characteristics | | Comparison of actual CVD hospitalization rates per 100,000 persons at age 65 and 66 | | | Results and coefficients of third degree polynomial regression model | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total CVD hospitalizations | Total population | Rate at age 65 | Rate at age 66 | Difference in rates at age 65 and 66 | Maximum predicted CVD hospitalization rate per 100,000 persons | Age at maximum rate | β0 | β0_SE | *P* | Predicted hospitalization rate at age 65 per 100,000 persons | β1 | β1_SE | *P* | β2 | β2_SE | *P* | β3 | β3_SE | *P* |
| 2003 | 37,330 | 140,015 | 29,356 | 10,545 | 18,810 | 55,927 | 92 | -1.81 | 0.141 | 0.000 | 16,647 | 0.013 | 0.032 | 0.703 | 0.0038 | 0.0020 | 0.068 | -9.68E-05 | 3.602E-05 | 0.011 |
| 2004 | 39,048 | 144,809 | 34,629 | 14,434 | 20,195 | 55,530 | 92 | -1.58 | 0.118 | 0.000 | 19,980 | -0.035 | 0.027 | 0.204 | 0.0065 | 0.0017 | 0.001 | -0.00014 | 3.021E-05 | 0.000 |
| 2005 | 41,555 | 150,338 | 31,498 | 14,643 | 16,854 | 61,265 | 91 | -1.62 | 0.127 | 0.000 | 19,288 | -0.034 | 0.029 | 0.261 | 0.0070 | 0.0018 | 0.001 | -0.000156 | 3.252E-05 | 0.000 |
| 2006 | 44,113 | 155,880 | 32,154 | 13,679 | 18,475 | 62,419 | 91 | -1.66 | 0.118 | 0.000 | 18,744 | -0.020 | 0.027 | 0.476 | 0.0063 | 0.0017 | 0.001 | -0.000147 | 3.015E-05 | 0.000 |
| **Asian women** | | | | | | | | | | | | | | | | | | | | |
| 1994 | 5,260 | 327,741 | 1,141 | 779 | 362 | 3,639 | 91 | -4.84 | 0.200 | 0.000 | 839 | 0.059 | 0.046 | 0.214 | 0.0019 | 0.0029 | 0.513 | -7.32E-05 | 5.12E-05 | 0.162 |
| 1995 | 11,737 | 350,759 | 1,500 | 694 | 806 | 8,883 | 92 | -4.51 | 0.156 | 0.000 | 1,234 | 0.118 | 0.036 | 0.003 | -0.0003 | 0.0022 | 0.903 | -4.48E-05 | 3.997E-05 | 0.270 |
| 1996 | 12,850 | 373,114 | 1,740 | 136 | 1,604 | 8,797 | 89 | -5.23 | 0.339 | 0.000 | 677 | 0.241 | 0.078 | 0.004 | -0.0059 | 0.0049 | 0.236 | 2.82E-05 | 8.666E-05 | 0.747 |
| 1997 | 21,965 | 395,462 | 3,168 | 648 | 2,520 | 14,973 | 89 | -4.34 | 0.233 | 0.000 | 1,512 | 0.148 | 0.054 | 0.010 | -0.0003 | 0.0034 | 0.938 | -7.08E-05 | 5.967E-05 | 0.244 |
| 1998 | 23,437 | 418,324 | 3,232 | 334 | 2,898 | 14,173 | 89 | -4.68 | 0.276 | 0.000 | 1,152 | 0.224 | 0.064 | 0.001 | -0.0049 | 0.0040 | 0.224 | 1.369E-05 | 7.058E-05 | 0.847 |
| 1999 | 23,804 | 440,366 | 3,058 | 312 | 2,745 | 13,918 | 88 | -5.16 | 0.311 | 0.000 | 760 | 0.286 | 0.072 | 0.000 | -0.0073 | 0.0045 | 0.111 | 4.062E-05 | 7.965E-05 | 0.614 |
| 2000 | 24,341 | 461,941 | 3,153 | 293 | 2,860 | 13,617 | 89 | -5.59 | 0.344 | 0.000 | 523 | 0.345 | 0.079 | 0.000 | -0.0103 | 0.0050 | 0.046 | 8.885E-05 | 8.806E-05 | 0.321 |
| 2001 | 28,856 | 509,587 | 4,258 | 890 | 3,368 | 15,614 | 89 | -4.72 | 0.272 | 0.000 | 1,061 | 0.179 | 0.063 | 0.008 | -0.0003 | 0.0039 | 0.940 | -9.1E-05 | 6.957E-05 | 0.200 |
| 2002 | 32,489 | 538,159 | 4,821 | 911 | 3,910 | 16,846 | 89 | -4.44 | 0.251 | 0.000 | 1,347 | 0.132 | 0.058 | 0.030 | 0.0023 | 0.0036 | 0.526 | -0.000133 | 6.412E-05 | 0.046 |
| 2003 | 42,326 | 568,045 | 6,315 | 1,255 | 5,060 | 22,659 | 89 | -4.07 | 0.239 | 0.000 | 1,854 | 0.080 | 0.055 | 0.156 | 0.0057 | 0.0034 | 0.108 | -0.000189 | 6.112E-05 | 0.004 |
| 2004 | 44,875 | 597,513 | 7,650 | 1,269 | 6,382 | 23,609 | 90 | -3.86 | 0.231 | 0.000 | 2,169 | 0.024 | 0.053 | 0.652 | 0.0092 | 0.0033 | 0.010 | -0.000251 | 5.914E-05 | 0.000 |
| 2005 | 50,839 | 631,375 | 7,758 | 2,518 | 5,240 | 25,986 | 90 | -3.47 | 0.187 | 0.000 | 3,021 | -0.044 | 0.043 | 0.315 | 0.0129 | 0.0027 | 0.000 | -0.00031 | 4.789E-05 | 0.000 |
| 2006 | 54,157 | 665,092 | 7,924 | 2,311 | 5,613 | 26,225 | 90 | -3.31 | 0.164 | 0.000 | 3,452 | -0.066 | 0.038 | 0.091 | 0.0137 | 0.0024 | 0.000 | -0.000316 | 4.199E-05 | 0.000 |
| **Asian men** | | | | | | | | | | | | | | | | | | | | |
| 1995 | 12,237 | 276,241 | 1,889 | 1,076 | 813 | 8,768 | 100 | -4.32 | 0.223 | 0.000 | 1,575 | 0.173 | 0.051 | 0.002 | -0.0054 | 0.0032 | 0.101 | 5.74E-05 | 5.702E-05 | 0.322 |
| 1997 | 21,775 | 290,524 | 3,701 | 752 | 2,948 | 18,406 | 87 | -3.99 | 0.399 | 0.000 | 2,111 | 0.134 | 0.092 | 0.156 | 0.0016 | 0.0057 | 0.779 | -0.000134 | 0.0001021 | 0.197 |
| 1998 | 23,260 | 305,608 | 3,911 | 688 | 3,223 | 17,004 | 86 | -4.31 | 0.265 | 0.000 | 1,667 | 0.225 | 0.061 | 0.001 | -0.0049 | 0.0038 | 0.206 | -2.56E-06 | 6.771E-05 | 0.970 |
| 1999 | 23,120 | 320,620 | 3,768 | 506 | 3,262 | 17,327 | 87 | -4.79 | 0.311 | 0.000 | 1,097 | 0.282 | 0.072 | 0.000 | -0.0073 | 0.0045 | 0.114 | 3.168E-05 | 7.956E-05 | 0.693 |
| 2000 | 22,801 | 335,946 | 3,781 | 520 | 3,261 | 16,839 | 87 | -5.01 | 0.325 | 0.000 | 889 | 0.293 | 0.075 | 0.000 | -0.0071 | 0.0047 | 0.139 | 2.1E-05 | 8.329E-05 | 0.803 |
| 2001 | 25,282 | 377,362 | 4,713 | 1,396 | 3,317 | 19,860 | 89 | -4.35 | 0.224 | 0.000 | 1,491 | 0.138 | 0.052 | 0.012 | 0.0023 | 0.0032 | 0.474 | -0.00014 | 5.739E-05 | 0.020 |
| 2002 | 28,657 | 399,712 | 4,725 | 1,155 | 3,570 | 20,813 | 89 | -4.32 | 0.209 | 0.000 | 1,559 | 0.157 | 0.048 | 0.003 | 0.0007 | 0.0030 | 0.806 | -0.000105 | 5.346E-05 | 0.058 |
| 2003 | 35,051 | 423,162 | 6,166 | 1,501 | 4,665 | 26,840 | 90 | -3.90 | 0.195 | 0.000 | 2,212 | 0.084 | 0.045 | 0.070 | 0.0052 | 0.0028 | 0.072 | -0.000179 | 4.998E-05 | 0.001 |
| 2004 | 37,204 | 447,711 | 7,598 | 1,413 | 6,185 | 28,082 | 90 | -3.77 | 0.206 | 0.000 | 2,446 | 0.048 | 0.048 | 0.322 | 0.0074 | 0.0030 | 0.018 | -0.000214 | 5.273E-05 | 0.000 |
| 2005 | 41,801 | 475,547 | 8,170 | 2,813 | 5,357 | 30,439 | 90 | -3.35 | 0.172 | 0.000 | 3,447 | -0.024 | 0.040 | 0.544 | 0.0113 | 0.0025 | 0.000 | -0.000276 | 4.391E-05 | 0.000 |
| 2006 | 42,770 | 502,233 | 8,554 | 2,774 | 5,780 | 30,146 | 90 | -3.19 | 0.159 | 0.000 | 3,918 | -0.064 | 0.037 | 0.093 | 0.0133 | 0.0023 | 0.000 | -0.000306 | 4.076E-05 | 0.000 |
| **Asian, overall** | | | | | | | | | | | | | | | | | | | | |
| 1994 | 10,564 | 576,980 | 1,274 | 963 | 310 | 3,830 | 91 | -4.67 | 0.152 | 0.000 | 1,001 | 0.061 | 0.035 | 0.094 | 0.0013 | 0.0022 | 0.559 | -5.98E-05 | 3.895E-05 | 0.135 |
| 1995 | 22,948 | 613,585 | 1,666 | 852 | 814 | 8,756 | 92 | -4.42 | 0.161 | 0.000 | 1,381 | 0.143 | 0.037 | 0.001 | -0.0026 | 0.0023 | 0.270 | 1.062E-06 | 4.113E-05 | 0.980 |
| 1996 | 25,087 | 649,355 | 2,005 | 299 | 1,707 | 8,875 | 88 | -4.93 | 0.258 | 0.000 | 903 | 0.227 | 0.060 | 0.001 | -0.0059 | 0.0037 | 0.123 | 3.343E-05 | 6.613E-05 | 0.617 |
| 1997 | 43,740 | 685,986 | 3,398 | 692 | 2,706 | 15,925 | 88 | -4.24 | 0.229 | 0.000 | 1,700 | 0.166 | 0.053 | 0.004 | -0.0014 | 0.0033 | 0.664 | -5.37E-05 | 5.871E-05 | 0.367 |
| 1998 | 46,697 | 723,932 | 3,525 | 485 | 3,041 | 15,197 | 88 | -4.52 | 0.253 | 0.000 | 1,364 | 0.229 | 0.058 | 0.000 | -0.0054 | 0.0036 | 0.148 | 1.749E-05 | 6.481E-05 | 0.789 |
| 1999 | 46,924 | 760,986 | 3,371 | 395 | 2,976 | 15,199 | 88 | -4.99 | 0.300 | 0.000 | 898 | 0.288 | 0.069 | 0.000 | -0.0077 | 0.0043 | 0.084 | 4.452E-05 | 7.665E-05 | 0.565 |
| 2000 | 47,142 | 797,887 | 3,434 | 391 | 3,043 | 14,654 | 88 | -5.33 | 0.315 | 0.000 | 669 | 0.329 | 0.073 | 0.000 | -0.0096 | 0.0045 | 0.041 | 7.669E-05 | 8.054E-05 | 0.348 |
| 2001 | 54,138 | 886,949 | 4,465 | 1,118 | 3,347 | 17,207 | 88 | -4.55 | 0.244 | 0.000 | 1,246 | 0.162 | 0.056 | 0.007 | 0.0007 | 0.0035 | 0.838 | -0.00011 | 6.236E-05 | 0.088 |
| 2002 | 61,146 | 937,871 | 4,777 | 1,022 | 3,755 | 18,384 | 89 | -4.38 | 0.226 | 0.000 | 1,446 | 0.143 | 0.052 | 0.010 | 0.0016 | 0.0033 | 0.615 | -0.000122 | 5.782E-05 | 0.042 |
| 2003 | 77,377 | 991,207 | 6,246 | 1,369 | 4,877 | 24,170 | 89 | -3.99 | 0.215 | 0.000 | 2,016 | 0.082 | 0.050 | 0.107 | 0.0054 | 0.0031 | 0.089 | -0.000184 | 5.497E-05 | 0.002 |

| | Population characteristics | | Comparison of actual CVD hospitalization rates per 100,000 persons at age 65 and 66 | | | Results and coefficients of third degree polynomial regression model | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total CVD hospitalizations | Total population | Rate at age 65 | Rate at age 66 | Difference in rates at age 65 and 66 | Maximum predicted CVD hospitalization rate per 100,000 persons | Age at maximum rate | β0 | β0_SE | *P* | Predicted hospitalization rate at age 65 per 100,000 persons | β1 | β1_SE | *P* | β2 | β2_SE | *P* | β3 | β3_SE | *P* |
| 2004 | 82,079 | 1,045,224 | 7,626 | 1,336 | 6,290 | 25,218 | 90 | -3.81 | 0.217 | 0.000 | 2,301 | 0.034 | 0.050 | 0.505 | 0.0085 | 0.0031 | 0.011 | -0.000237 | 5.564E-05 | 0.000 |
| 2005 | 92,640 | 1,106,922 | 7,950 | 2,656 | 5,294 | 27,600 | 90 | -3.41 | 0.177 | 0.000 | 3,229 | -0.037 | 0.041 | 0.372 | 0.0123 | 0.0025 | 0.000 | -0.000298 | 4.532E-05 | 0.000 |
| 2006 | 96,927 | 1,167,325 | 8,213 | 2,526 | 5,687 | 27,601 | 90 | -3.25 | 0.158 | 0.000 | 3,665 | -0.065 | 0.036 | 0.083 | 0.0135 | 0.0023 | 0.000 | -0.000312 | 4.033E-05 | 0.000 |
| **Hispanic women** | | | | | | | | | | | | | | | | | | | | |
| 1994 | 14,222 | 829,828 | 2,217 | 1,345 | 872 | 2,176 | 92 | -4.09 | 0.104 | 0.000 | 1,635 | -0.024 | 0.024 | 0.316 | 0.0027 | 0.0015 | 0.081 | -5.31E-05 | 2.663E-05 | 0.055 |
| 1995 | 30,599 | 873,223 | 2,972 | 1,500 | 1,472 | 4,950 | 96 | -3.74 | 0.140 | 0.000 | 2,484 | 0.048 | 0.032 | 0.145 | -0.0009 | 0.0020 | 0.672 | 2.181E-06 | 3.595E-05 | 0.952 |
| 1996 | 33,397 | 919,828 | 2,899 | 644 | 2,255 | 5,568 | 100 | -4.24 | 0.208 | 0.000 | 1,668 | 0.151 | 0.048 | 0.004 | -0.0060 | 0.0030 | 0.053 | 7.975E-05 | 5.327E-05 | 0.144 |
| 1997 | 56,331 | 963,474 | 4,078 | 1,152 | 2,926 | 9,240 | 84 | -4.10 | 0.203 | 0.000 | 1,998 | 0.195 | 0.047 | 0.000 | -0.0067 | 0.0029 | 0.029 | 6.256E-05 | 5.197E-05 | 0.237 |
| 1998 | 61,589 | 1,009,813 | 4,442 | 1,115 | 3,327 | 9,765 | 84 | -4.17 | 0.202 | 0.000 | 1,904 | 0.212 | 0.047 | 0.000 | -0.0074 | 0.0029 | 0.016 | 6.852E-05 | 5.163E-05 | 0.194 |
| 1999 | 64,778 | 1,055,063 | 4,565 | 892 | 3,673 | 10,337 | 84 | -4.44 | 0.235 | 0.000 | 1,503 | 0.252 | 0.054 | 0.000 | -0.0090 | 0.0034 | 0.012 | 9.212E-05 | 6.02E-05 | 0.136 |
| 2000 | 66,488 | 1,107,711 | 3,868 | 937 | 2,931 | 10,647 | 85 | -4.67 | 0.224 | 0.000 | 1,226 | 0.274 | 0.052 | 0.000 | -0.0095 | 0.0032 | 0.006 | 9.25E-05 | 5.721E-05 | 0.116 |
| 2001 | 72,261 | 1,068,605 | 5,133 | 1,301 | 3,832 | 14,182 | 88 | -4.47 | 0.238 | 0.000 | 1,422 | 0.227 | 0.055 | 0.000 | -0.0058 | 0.0034 | 0.100 | 3.063E-05 | 6.102E-05 | 0.619 |
| 2002 | 78,090 | 1,118,257 | 5,380 | 1,350 | 4,030 | 15,752 | 89 | -4.30 | 0.227 | 0.000 | 1,609 | 0.177 | 0.052 | 0.002 | -0.0022 | 0.0033 | 0.503 | -3.8E-05 | 5.816E-05 | 0.519 |
| 2003 | 93,690 | 1,170,667 | 6,689 | 1,528 | 5,162 | 19,926 | 90 | -4.10 | 0.231 | 0.000 | 1,914 | 0.140 | 0.053 | 0.013 | 0.0004 | 0.0033 | 0.910 | -8.05E-05 | 5.919E-05 | 0.184 |
| 2004 | 96,506 | 1,223,156 | 7,540 | 1,438 | 6,101 | 21,191 | 90 | -4.00 | 0.239 | 0.000 | 2,029 | 0.099 | 0.055 | 0.082 | 0.0031 | 0.0034 | 0.375 | -0.000126 | 6.109E-05 | 0.047 |
| 2005 | 102,331 | 1,281,285 | 7,655 | 2,139 | 5,516 | 23,102 | 91 | -3.76 | 0.229 | 0.000 | 2,444 | 0.042 | 0.053 | 0.431 | 0.0063 | 0.0033 | 0.064 | -0.000176 | 5.858E-05 | 0.005 |
| 2006 | 101,479 | 1,338,272 | 7,378 | 2,039 | 5,338 | 23,207 | 91 | -3.65 | 0.215 | 0.000 | 2,609 | -0.004 | 0.050 | 0.937 | 0.0093 | 0.0031 | 0.005 | -0.000227 | 5.495E-05 | 0.000 |
| **Hispanic men** | | | | | | | | | | | | | | | | | | | | |
| 1994 | 12,122 | 593,465 | 2,602 | 1,716 | 886 | 2,703 | 96 | -3.90 | 0.180 | 0.000 | 1,983 | -0.019 | 0.041 | 0.643 | 0.0020 | 0.0026 | 0.437 | -3.57E-05 | 4.594E-05 | 0.443 |
| 1995 | 26,036 | 627,795 | 3,302 | 1,978 | 1,324 | 6,228 | 90 | -3.49 | 0.184 | 0.000 | 3,115 | 0.024 | 0.042 | 0.580 | 0.0013 | 0.0026 | 0.630 | -4.38E-05 | 4.709E-05 | 0.359 |
| 1996 | 27,706 | 663,457 | 3,499 | 1,114 | 2,385 | 6,283 | 90 | -3.85 | 0.216 | 0.000 | 2,353 | 0.099 | 0.050 | 0.056 | -0.0028 | 0.0031 | 0.371 | 2.357E-05 | 5.541E-05 | 0.673 |
| 1997 | 42,867 | 697,034 | 4,796 | 1,657 | 3,138 | 9,330 | 84 | -3.77 | 0.199 | 0.000 | 2,699 | 0.163 | 0.046 | 0.001 | -0.0057 | 0.0029 | 0.054 | 5.427E-05 | 5.096E-05 | 0.295 |
| 1998 | 46,884 | 732,298 | 5,143 | 1,719 | 3,425 | 9,749 | 82 | -3.90 | 0.171 | 0.000 | 2,445 | 0.201 | 0.040 | 0.000 | -0.0078 | 0.0025 | 0.003 | 8.457E-05 | 4.385E-05 | 0.063 |
| 1999 | 47,823 | 767,236 | 4,909 | 1,611 | 3,298 | 10,116 | 84 | -4.05 | 0.184 | 0.000 | 2,129 | 0.207 | 0.043 | 0.000 | -0.0074 | 0.0027 | 0.009 | 7.134E-05 | 4.719E-05 | 0.140 |
| 2000 | 47,554 | 808,226 | 4,155 | 1,391 | 2,764 | 10,057 | 83 | -4.45 | 0.185 | 0.000 | 1,515 | 0.266 | 0.043 | 0.000 | -0.0101 | 0.0027 | 0.001 | 0.0001097 | 4.736E-05 | 0.027 |
| 2001 | 52,123 | 772,079 | 5,274 | 1,702 | 3,572 | 14,526 | 87 | -4.14 | 0.196 | 0.000 | 1,904 | 0.183 | 0.045 | 0.000 | -0.0033 | 0.0028 | 0.256 | -2.34E-05 | 5.006E-05 | 0.644 |
| 2002 | 56,533 | 808,042 | 5,727 | 1,723 | 4,005 | 15,629 | 88 | -4.11 | 0.206 | 0.000 | 1,958 | 0.177 | 0.047 | 0.001 | -0.0029 | 0.0030 | 0.331 | -2.23E-05 | 5.263E-05 | 0.674 |
| 2003 | 67,943 | 847,849 | 7,000 | 1,939 | 5,061 | 19,330 | 89 | -3.97 | 0.217 | 0.000 | 2,222 | 0.162 | 0.050 | 0.003 | -0.0019 | 0.0031 | 0.548 | -3.39E-05 | 5.562E-05 | 0.546 |
| 2004 | 68,741 | 888,445 | 8,298 | 2,019 | 6,279 | 20,680 | 90 | -3.76 | 0.234 | 0.000 | 2,537 | 0.086 | 0.054 | 0.120 | 0.0031 | 0.0034 | 0.360 | -0.000124 | 5.99E-05 | 0.047 |
| 2005 | 71,474 | 933,113 | 8,185 | 2,446 | 5,738 | 21,592 | 90 | -3.62 | 0.217 | 0.000 | 2,794 | 0.038 | 0.050 | 0.452 | 0.0065 | 0.0031 | 0.045 | -0.000188 | 5.56E-05 | 0.002 |
| 2006 | 71,289 | 977,179 | 8,414 | 2,276 | 6,139 | 22,273 | 90 | -3.53 | 0.220 | 0.000 | 2,953 | -0.004 | 0.051 | 0.938 | 0.0090 | 0.0032 | 0.008 | -0.000226 | 5.624E-05 | 0.000 |
| **Hispanic, overall** | | | | | | | | | | | | | | | | | | | | |
| 1994 | 26,344 | 1,423,293 | 2,391 | 1,512 | 879 | 2,355 | 94 | -4.00 | 0.108 | 0.000 | 1,801 | -0.024 | 0.025 | 0.339 | 0.0024 | 0.0015 | 0.124 | -4.57E-05 | 2.756E-05 | 0.107 |
| 1995 | 56,635 | 1,501,018 | 3,123 | 1,715 | 1,407 | 5,364 | 92 | -3.63 | 0.137 | 0.000 | 2,758 | 0.039 | 0.032 | 0.226 | -0.0001 | 0.0020 | 0.947 | -1.3E-05 | 3.499E-05 | 0.713 |
| 1996 | 61,103 | 1,583,285 | 3,170 | 857 | 2,313 | 5,804 | 100 | -4.05 | 0.181 | 0.000 | 1,976 | 0.126 | 0.042 | 0.005 | -0.0047 | 0.0026 | 0.083 | 5.786E-05 | 4.639E-05 | 0.221 |
| 1997 | 99,198 | 1,660,508 | 4,403 | 1,379 | 3,024 | 9,261 | 84 | -3.94 | 0.176 | 0.000 | 2,316 | 0.179 | 0.041 | 0.000 | -0.0062 | 0.0025 | 0.020 | 5.928E-05 | 4.513E-05 | 0.198 |
| 1998 | 108,473 | 1,742,111 | 4,756 | 1,386 | 3,370 | 9,750 | 83 | -4.03 | 0.179 | 0.000 | 2,162 | 0.203 | 0.041 | 0.000 | -0.0073 | 0.0026 | 0.008 | 7.187E-05 | 4.58E-05 | 0.126 |
| 1999 | 112,601 | 1,822,299 | 4,720 | 1,212 | 3,508 | 10,255 | 84 | -4.24 | 0.205 | 0.000 | 1,795 | 0.227 | 0.047 | 0.000 | -0.0080 | 0.0030 | 0.011 | 7.927E-05 | 5.246E-05 | 0.141 |
| 2000 | 114,042 | 1,915,937 | 3,997 | 1,140 | 2,857 | 10,435 | 84 | -4.54 | 0.198 | 0.000 | 1,376 | 0.263 | 0.046 | 0.000 | -0.0093 | 0.0028 | 0.003 | 9.3E-05 | 5.06E-05 | 0.075 |
| 2001 | 124,384 | 1,840,684 | 5,197 | 1,482 | 3,715 | 14,232 | 88 | -4.33 | 0.213 | 0.000 | 1,624 | 0.211 | 0.049 | 0.000 | -0.0051 | 0.0031 | 0.105 | 1.749E-05 | 5.44E-05 | 0.750 |
| 2002 | 134,623 | 1,926,299 | 5,538 | 1,518 | 4,019 | 15,754 | 88 | -4.20 | 0.210 | 0.000 | 1,777 | 0.174 | 0.048 | 0.001 | -0.0024 | 0.0030 | 0.441 | -3.35E-05 | 5.369E-05 | 0.537 |

| | Population characteristics | | Comparison of actual CVD hospitalization rates per 100,000 persons at age 65 and 66 | | | Results and coefficients of third degree polynomial regression model | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total CVD hospitalizations | Total population | Rate at age 65 | Rate at age 66 | Difference in rates at age 65 and 66 | Maximum predicted CVD hospitalization rate per 100,000 persons | Age at maximum rate | β0 | β0_SE | *P* | Predicted hospitalization rate at age 65 per 100,000 persons | β1 | β1_SE | *P* | β2 | β2_SE | *P* | β3 | β3_SE | *P* |
| 2003 | 161,633 | 2,018,516 | 6,831 | 1,714 | 5,118 | 19,760 | 90 | -4.02 | 0.219 | 0.000 | 2,074 | 0.145 | 0.051 | 0.007 | -0.0003 | 0.0032 | 0.922 | -6.58E-05 | 5.617E-05 | 0.250 |
| 2004 | 165,247 | 2,111,601 | 7,887 | 1,703 | 6,184 | 21,076 | 90 | -3.88 | 0.230 | 0.000 | 2,273 | 0.090 | 0.053 | 0.100 | 0.0033 | 0.0033 | 0.326 | -0.000128 | 5.874E-05 | 0.037 |
| 2005 | 173,805 | 2,214,398 | 7,897 | 2,280 | 5,617 | 22,543 | 91 | -3.70 | 0.222 | 0.000 | 2,599 | 0.042 | 0.051 | 0.423 | 0.0062 | 0.0032 | 0.060 | -0.000176 | 5.674E-05 | 0.004 |
| 2006 | 172,768 | 2,315,451 | 7,853 | 2,147 | 5,705 | 22,928 | 91 | -3.59 | 0.214 | 0.000 | 2,771 | -0.005 | 0.049 | 0.919 | 0.0092 | 0.0031 | 0.005 | -0.000225 | 5.465E-05 | 0.000 |
| **Black women** | | | | | | | | | | | | | | | | | | | | |
| 1991 | 343,592 | 1,529,904 | 12,626 | 14,382 | -1,757 | 47,713 | 94 | -1.93 | 0.083 | 0.000 | 14,634 | 0.006 | 0.019 | 0.757 | 0.0035 | 0.0012 | 0.006 | -7.99E-05 | 2.117E-05 | 0.001 |
| 1992 | 379,242 | 1,555,302 | 27,127 | 13,653 | 13,473 | 51,914 | 94 | -1.65 | 0.096 | 0.000 | 18,551 | -0.039 | 0.022 | 0.086 | 0.0058 | 0.0014 | 0.000 | -0.000113 | 2.448E-05 | 0.000 |
| 1993 | 408,201 | 1,579,031 | 29,544 | 14,137 | 15,407 | 54,156 | 95 | -1.63 | 0.102 | 0.000 | 19,093 | -0.030 | 0.024 | 0.209 | 0.0053 | 0.0015 | 0.001 | -0.000104 | 2.61E-05 | 0.000 |
| 1994 | 468,238 | 1,599,518 | 34,446 | 16,092 | 18,354 | 59,192 | 95 | -1.51 | 0.101 | 0.000 | 21,612 | -0.023 | 0.023 | 0.339 | 0.0046 | 0.0015 | 0.004 | -9.01E-05 | 2.585E-05 | 0.001 |
| 1995 | 511,536 | 1,619,458 | 33,730 | 14,918 | 18,812 | 69,939 | 97 | -1.59 | 0.108 | 0.000 | 20,600 | 0.005 | 0.025 | 0.843 | 0.0031 | 0.0016 | 0.055 | -6.38E-05 | 2.76E-05 | 0.027 |
| 1996 | 538,412 | 1,638,906 | 36,061 | 16,128 | 19,933 | 72,062 | 97 | -1.58 | 0.113 | 0.000 | 20,917 | 0.009 | 0.026 | 0.744 | 0.0030 | 0.0016 | 0.079 | -6.27E-05 | 2.894E-05 | 0.038 |
| 1997 | 556,518 | 1,659,172 | 32,111 | 15,631 | 16,481 | 71,699 | 96 | -1.64 | 0.109 | 0.000 | 19,910 | 0.023 | 0.025 | 0.375 | 0.0025 | 0.0016 | 0.126 | -5.93E-05 | 2.79E-05 | 0.041 |
| 1998 | 494,609 | 1,675,076 | 31,679 | 15,536 | 16,143 | 57,553 | 94 | -1.68 | 0.115 | 0.000 | 18,845 | 0.010 | 0.026 | 0.704 | 0.0030 | 0.0016 | 0.076 | -7.04E-05 | 2.932E-05 | 0.022 |
| 1999 | 506,193 | 1,687,803 | 33,318 | 15,260 | 18,058 | 57,875 | 93 | -1.65 | 0.113 | 0.000 | 19,315 | 0.001 | 0.026 | 0.955 | 0.0037 | 0.0016 | 0.028 | -8.57E-05 | 2.894E-05 | 0.006 |
| 2000 | 512,267 | 1,705,721 | 30,828 | 16,813 | 14,015 | 58,049 | 92 | -1.63 | 0.100 | 0.000 | 19,522 | -0.009 | 0.023 | 0.701 | 0.0047 | 0.0014 | 0.003 | -0.000106 | 2.554E-05 | 0.000 |
| 2001 | 546,628 | 1,764,050 | 40,247 | 16,903 | 23,343 | 60,651 | 93 | -1.42 | 0.106 | 0.000 | 23,220 | -0.050 | 0.024 | 0.049 | 0.0068 | 0.0015 | 0.000 | -0.000138 | 2.715E-05 | 0.000 |
| 2002 | 571,584 | 1,782,205 | 41,449 | 17,554 | 23,896 | 62,872 | 93 | -1.38 | 0.102 | 0.000 | 24,028 | -0.049 | 0.024 | 0.046 | 0.0067 | 0.0015 | 0.000 | -0.000136 | 2.614E-05 | 0.000 |
| 2003 | 676,899 | 1,805,272 | 49,416 | 20,131 | 29,284 | 81,143 | 93 | -1.23 | 0.113 | 0.000 | 27,721 | -0.064 | 0.026 | 0.020 | 0.0080 | 0.0016 | 0.000 | -0.000157 | 2.892E-05 | 0.000 |
| 2004 | 673,375 | 1,826,684 | 56,860 | 18,124 | 38,736 | 80,341 | 93 | -1.19 | 0.127 | 0.000 | 28,314 | -0.082 | 0.029 | 0.009 | 0.0091 | 0.0018 | 0.000 | -0.000178 | 3.254E-05 | 0.000 |
| 2005 | 676,671 | 1,859,518 | 53,758 | 18,870 | 34,888 | 78,029 | 93 | -1.21 | 0.124 | 0.000 | 27,682 | -0.079 | 0.029 | 0.010 | 0.0090 | 0.0018 | 0.000 | -0.000177 | 3.177E-05 | 0.000 |
| 2006 | 669,538 | 1,891,521 | 55,787 | 17,393 | 38,394 | 77,310 | 93 | -1.21 | 0.129 | 0.000 | 27,472 | -0.088 | 0.030 | 0.006 | 0.0095 | 0.0019 | 0.000 | -0.000184 | 3.312E-05 | 0.000 |
| **Black men** | | | | | | | | | | | | | | | | | | | | |
| 1991 | 212,877 | 955,418 | 13,010 | 14,217 | -1,208 | 44,015 | 91 | -1.96 | 0.080 | 0.000 | 14,491 | 0.027 | 0.018 | 0.154 | 0.0026 | 0.0012 | 0.032 | -7.45E-05 | 2.046E-05 | 0.001 |
| 1992 | 235,256 | 973,622 | 25,200 | 13,537 | 11,663 | 48,193 | 92 | -1.70 | 0.091 | 0.000 | 18,161 | -0.015 | 0.021 | 0.494 | 0.0046 | 0.0013 | 0.001 | -0.000103 | 2.339E-05 | 0.000 |
| 1993 | 247,447 | 991,864 | 26,718 | 14,145 | 12,572 | 48,913 | 93 | -1.69 | 0.092 | 0.000 | 18,381 | -0.005 | 0.021 | 0.833 | 0.0038 | 0.0013 | 0.007 | -8.72E-05 | 2.365E-05 | 0.001 |
| 1994 | 277,683 | 1,008,749 | 30,538 | 15,653 | 14,885 | 52,942 | 93 | -1.59 | 0.100 | 0.000 | 20,349 | -0.002 | 0.023 | 0.917 | 0.0036 | 0.0014 | 0.018 | -8.17E-05 | 2.559E-05 | 0.003 |
| 1995 | 301,187 | 1,026,075 | 28,470 | 15,214 | 13,255 | 61,510 | 93 | -1.65 | 0.116 | 0.000 | 19,534 | 0.016 | 0.027 | 0.552 | 0.0030 | 0.0017 | 0.087 | -7.31E-05 | 2.971E-05 | 0.020 |
| 1996 | 312,138 | 1,042,306 | 30,938 | 16,180 | 14,758 | 63,055 | 94 | -1.64 | 0.111 | 0.000 | 19,752 | 0.019 | 0.026 | 0.461 | 0.0027 | 0.0016 | 0.102 | -6.7E-05 | 2.839E-05 | 0.025 |
| 1997 | 319,616 | 1,059,404 | 28,728 | 15,068 | 13,661 | 62,984 | 94 | -1.72 | 0.109 | 0.000 | 18,590 | 0.040 | 0.025 | 0.124 | 0.0015 | 0.0016 | 0.345 | -4.77E-05 | 2.79E-05 | 0.097 |
| 1998 | 282,267 | 1,074,675 | 27,070 | 15,681 | 11,389 | 50,507 | 92 | -1.75 | 0.103 | 0.000 | 17,752 | 0.016 | 0.024 | 0.517 | 0.0029 | 0.0015 | 0.060 | -7.49E-05 | 2.645E-05 | 0.008 |
| 1999 | 288,457 | 1,090,162 | 27,818 | 15,602 | 12,215 | 50,213 | 92 | -1.71 | 0.115 | 0.000 | 18,240 | 0.007 | 0.027 | 0.781 | 0.0035 | 0.0017 | 0.045 | -8.62E-05 | 2.948E-05 | 0.006 |
| 2000 | 290,289 | 1,105,285 | 28,263 | 16,331 | 11,932 | 49,101 | 91 | -1.65 | 0.095 | 0.000 | 19,009 | -0.011 | 0.022 | 0.617 | 0.0047 | 0.0014 | 0.002 | -0.000112 | 2.43E-05 | 0.000 |
| 2001 | 311,212 | 1,089,147 | 33,775 | 17,586 | 16,188 | 57,033 | 92 | -1.48 | 0.090 | 0.000 | 22,176 | -0.037 | 0.021 | 0.086 | 0.0063 | 0.0013 | 0.000 | -0.000135 | 2.314E-05 | 0.000 |
| 2002 | 328,428 | 1,105,635 | 35,170 | 18,806 | 16,364 | 61,578 | 91 | -1.37 | 0.082 | 0.000 | 24,108 | -0.057 | 0.019 | 0.005 | 0.0077 | 0.0012 | 0.000 | -0.000161 | 2.091E-05 | 0.000 |
| 2003 | 392,424 | 1,125,875 | 43,618 | 21,895 | 21,723 | 76,097 | 91 | -1.19 | 0.115 | 0.000 | 28,465 | -0.071 | 0.027 | 0.012 | 0.0089 | 0.0017 | 0.000 | -0.000185 | 2.951E-05 | 0.000 |
| 2004 | 394,983 | 1,145,326 | 49,703 | 21,024 | 28,679 | 75,769 | 92 | -1.15 | 0.109 | 0.000 | 29,376 | -0.082 | 0.025 | 0.003 | 0.0093 | 0.0016 | 0.000 | -0.000187 | 2.782E-05 | 0.000 |
| 2005 | 400,562 | 1,172,907 | 47,801 | 21,231 | 26,570 | 72,139 | 91 | -1.17 | 0.100 | 0.000 | 28,804 | -0.079 | 0.023 | 0.002 | 0.0092 | 0.0014 | 0.000 | -0.000189 | 2.559E-05 | 0.000 |
| 2006 | 403,634 | 1,197,708 | 50,362 | 20,101 | 30,260 | 70,387 | 92 | -1.19 | 0.115 | 0.000 | 28,544 | -0.076 | 0.026 | 0.007 | 0.0088 | 0.0017 | 0.000 | -0.00018 | 2.937E-05 | 0.000 |
| **Black, overall** | | | | | | | | | | | | | | | | | | | | |
| 1991 | 556,469 | 2,485,322 | 12,787 | 14,310 | -1,523 | 46,510 | 94 | -1.94 | 0.081 | 0.000 | 14,591 | 0.015 | 0.019 | 0.436 | 0.0031 | 0.0012 | 0.013 | -7.46E-05 | 2.064E-05 | 0.001 |
| 1992 | 614,498 | 2,528,924 | 26,312 | 13,603 | 12,709 | 50,784 | 94 | -1.67 | 0.093 | 0.000 | 18,388 | -0.028 | 0.021 | 0.197 | 0.0052 | 0.0013 | 0.000 | -0.000105 | 2.374E-05 | 0.000 |

| | Population characteristics | | Comparison of actual CVD hospitalization rates per 100,000 persons at age 65 and 66 | | | Results and coefficients of third degree polynomial regression model | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total CVD hospitalizations | Total population | Rate at age 65 | Rate at age 66 | Difference in rates at age 65 and 66 | Maximum predicted CVD hospitalization rate per 100,000 persons | Age at maximum rate | β0 | β0_SE | *P* | Predicted hospitalization rate at age 65 per 100,000 persons | β1 | β1_SE | *P* | β2 | β2_SE | *P* | β3 | β3_SE | *P* |
| 1993 | 655,648 | 2,570,895 | 28,344 | 14,141 | 14,203 | 52,703 | 94 | -1.65 | 0.098 | 0.000 | 18,834 | -0.020 | 0.023 | 0.380 | 0.0047 | 0.0014 | 0.002 | -9.52E-05 | 2.499E-05 | 0.001 |
| 1994 | 745,921 | 2,608,267 | 32,779 | 15,900 | 16,880 | 57,433 | 95 | -1.55 | 0.098 | 0.000 | 21,074 | -0.014 | 0.023 | 0.548 | 0.0041 | 0.0014 | 0.007 | -8.36E-05 | 2.509E-05 | 0.002 |
| 1995 | 812,723 | 2,645,533 | 31,491 | 15,049 | 16,443 | 67,519 | 96 | -1.62 | 0.105 | 0.000 | 20,102 | 0.012 | 0.024 | 0.628 | 0.0028 | 0.0015 | 0.072 | -6.15E-05 | 2.675E-05 | 0.028 |
| 1996 | 850,550 | 2,681,212 | 33,894 | 16,151 | 17,743 | 69,639 | 96 | -1.61 | 0.109 | 0.000 | 20,416 | 0.014 | 0.025 | 0.583 | 0.0027 | 0.0016 | 0.093 | -6.06E-05 | 2.791E-05 | 0.038 |
| 1997 | 876,134 | 2,718,576 | 30,684 | 15,385 | 15,299 | 69,476 | 96 | -1.67 | 0.106 | 0.000 | 19,412 | 0.028 | 0.024 | 0.252 | 0.0021 | 0.0015 | 0.169 | -5.47E-05 | 2.702E-05 | 0.051 |
| 1998 | 776,876 | 2,749,751 | 29,734 | 15,599 | 14,135 | 55,674 | 94 | -1.71 | 0.109 | 0.000 | 18,400 | 0.013 | 0.025 | 0.619 | 0.0029 | 0.0016 | 0.071 | -6.99E-05 | 2.78E-05 | 0.017 |
| 1999 | 794,650 | 2,777,965 | 30,958 | 15,409 | 15,549 | 55,796 | 93 | -1.67 | 0.108 | 0.000 | 18,881 | 0.004 | 0.025 | 0.877 | 0.0036 | 0.0016 | 0.028 | -8.4E-05 | 2.775E-05 | 0.005 |
| 2000 | 802,556 | 2,811,006 | 29,752 | 16,599 | 13,153 | 55,571 | 92 | -1.64 | 0.096 | 0.000 | 19,321 | -0.010 | 0.022 | 0.656 | 0.0047 | 0.0014 | 0.002 | -0.000107 | 2.446E-05 | 0.000 |
| 2001 | 857,840 | 2,853,197 | 37,444 | 17,198 | 20,246 | 59,686 | 93 | -1.44 | 0.098 | 0.000 | 22,819 | -0.045 | 0.023 | 0.056 | 0.0065 | 0.0014 | 0.000 | -0.000135 | 2.501E-05 | 0.000 |
| 2002 | 900,012 | 2,887,840 | 38,712 | 18,093 | 20,619 | 62,432 | 92 | -1.39 | 0.093 | 0.000 | 23,944 | -0.049 | 0.021 | 0.030 | 0.0068 | 0.0013 | 0.000 | -0.000139 | 2.375E-05 | 0.000 |
| 2003 | 1,069,323 | 2,931,147 | 46,893 | 20,897 | 25,996 | 79,742 | 93 | -1.22 | 0.107 | 0.000 | 27,895 | -0.063 | 0.025 | 0.016 | 0.0080 | 0.0015 | 0.000 | -0.000159 | 2.746E-05 | 0.000 |
| 2004 | 1,068,358 | 2,972,010 | 53,724 | 19,381 | 34,343 | 79,071 | 93 | -1.18 | 0.117 | 0.000 | 28,746 | -0.081 | 0.027 | 0.006 | 0.0090 | 0.0017 | 0.000 | -0.000177 | 3.004E-05 | 0.000 |
| 2005 | 1,077,233 | 3,032,425 | 51,158 | 19,900 | 31,258 | 76,321 | 92 | -1.20 | 0.114 | 0.000 | 28,123 | -0.077 | 0.026 | 0.006 | 0.0089 | 0.0016 | 0.000 | -0.000175 | 2.916E-05 | 0.000 |
| 2006 | 1,073,172 | 3,089,229 | 53,432 | 18,571 | 34,862 | 75,440 | 93 | -1.20 | 0.120 | 0.000 | 28,036 | -0.083 | 0.028 | 0.005 | 0.0092 | 0.0017 | 0.000 | -0.000179 | 3.08E-05 | 0.000 |
| | | | | | | | | **White women** | | | | | | | | | | | | |
| 1991 | 3,318,186 | 16,325,605 | 9,226 | 9,585 | -360 | 44,209 | 94 | -2.41 | 0.032 | 0.000 | 9,526 | 0.057 | 0.007 | 0.000 | 0.0016 | 0.0005 | 0.001 | -5.85E-05 | 8.154E-06 | 0.000 |
| 1992 | 3,580,576 | 16,510,839 | 12,894 | 10,132 | 2,762 | 46,784 | 93 | -2.25 | 0.040 | 0.000 | 10,937 | 0.035 | 0.009 | 0.001 | 0.0028 | 0.0006 | 0.000 | -7.81E-05 | 1.015E-05 | 0.000 |
| 1993 | 3,762,736 | 16,700,161 | 13,419 | 10,313 | 3,106 | 48,363 | 93 | -2.23 | 0.043 | 0.000 | 11,184 | 0.035 | 0.010 | 0.001 | 0.0030 | 0.0006 | 0.000 | -8.21E-05 | 1.091E-05 | 0.000 |
| 1994 | 4,136,471 | 16,814,520 | 15,051 | 11,199 | 3,852 | 50,742 | 93 | -2.12 | 0.041 | 0.000 | 12,415 | 0.033 | 0.010 | 0.002 | 0.0030 | 0.0006 | 0.000 | -8.35E-05 | 1.059E-05 | 0.000 |
| 1995 | 4,406,928 | 16,912,767 | 11,748 | 10,419 | 1,328 | 58,778 | 95 | -2.28 | 0.032 | 0.000 | 10,926 | 0.068 | 0.007 | 0.000 | 0.0012 | 0.0005 | 0.016 | -5E-05 | 8.149E-06 | 0.000 |
| 1996 | 4,601,493 | 16,980,510 | 12,287 | 11,509 | 779 | 61,188 | 94 | -2.25 | 0.033 | 0.000 | 11,264 | 0.063 | 0.008 | 0.000 | 0.0016 | 0.0005 | 0.001 | -5.99E-05 | 8.386E-06 | 0.000 |
| 1997 | 4,732,812 | 17,002,404 | 11,451 | 11,492 | -41 | 62,749 | 94 | -2.26 | 0.030 | 0.000 | 11,165 | 0.065 | 0.007 | 0.000 | 0.0017 | 0.0004 | 0.001 | -6.24E-05 | 7.784E-06 | 0.000 |
| 1998 | 3,987,592 | 16,989,418 | 10,457 | 10,571 | -114 | 47,741 | 93 | -2.34 | 0.027 | 0.000 | 10,243 | 0.060 | 0.006 | 0.000 | 0.0016 | 0.0004 | 0.000 | -6.05E-05 | 6.799E-06 | 0.000 |
| 1999 | 4,026,751 | 16,933,380 | 10,883 | 10,585 | 297 | 48,888 | 93 | -2.32 | 0.027 | 0.000 | 10,399 | 0.053 | 0.006 | 0.000 | 0.0021 | 0.0004 | 0.000 | -6.98E-05 | 7.019E-06 | 0.000 |
| 2000 | 4,109,698 | 16,946,287 | 10,343 | 11,694 | -1,350 | 48,847 | 92 | -2.29 | 0.027 | 0.000 | 10,696 | 0.050 | 0.006 | 0.000 | 0.0024 | 0.0004 | 0.000 | -7.6E-05 | 6.842E-06 | 0.000 |
| 2001 | 4,321,910 | 17,162,625 | 12,588 | 11,799 | 789 | 50,073 | 92 | -2.15 | 0.022 | 0.000 | 12,019 | 0.032 | 0.005 | 0.000 | 0.0032 | 0.0003 | 0.000 | -8.81E-05 | 5.706E-06 | 0.000 |
| 2002 | 4,467,781 | 17,135,131 | 13,039 | 12,538 | 501 | 51,534 | 92 | -2.09 | 0.020 | 0.000 | 12,774 | 0.026 | 0.005 | 0.000 | 0.0034 | 0.0003 | 0.000 | -9.17E-05 | 5.124E-06 | 0.000 |
| 2003 | 5,440,531 | 17,155,075 | 15,864 | 13,962 | 1,902 | 69,959 | 93 | -1.93 | 0.025 | 0.000 | 14,731 | 0.015 | 0.006 | 0.013 | 0.0046 | 0.0004 | 0.000 | -0.00011 | 6.313E-06 | 0.000 |
| 2004 | 5,395,005 | 17,172,235 | 17,693 | 13,618 | 4,076 | 69,179 | 93 | -1.89 | 0.034 | 0.000 | 15,288 | 0.003 | 0.008 | 0.672 | 0.0052 | 0.0005 | 0.000 | -0.00012 | 8.73E-06 | 0.000 |
| 2005 | 5,350,416 | 17,226,693 | 17,304 | 13,197 | 4,108 | 69,808 | 93 | -1.92 | 0.038 | 0.000 | 14,846 | 0.005 | 0.009 | 0.582 | 0.0051 | 0.0005 | 0.000 | -0.000117 | 9.763E-06 | 0.000 |
| 2006 | 5,362,377 | 17,325,697 | 17,679 | 13,053 | 4,626 | 69,297 | 93 | -1.92 | 0.042 | 0.000 | 14,801 | 0.005 | 0.010 | 0.578 | 0.0050 | 0.0006 | 0.000 | -0.000115 | 1.077E-05 | 0.000 |
| | | | | | | | | **White men** | | | | | | | | | | | | |
| 1991 | 2,515,400 | 11,031,743 | 12,399 | 13,225 | -826 | 50,012 | 95 | -2.12 | 0.035 | 0.000 | 12,813 | 0.062 | 0.008 | 0.000 | 0.0005 | 0.0005 | 0.341 | -3.23E-05 | 9.054E-06 | 0.001 |
| 1992 | 2,689,447 | 11,205,306 | 16,885 | 13,569 | 3,315 | 52,394 | 94 | -1.96 | 0.040 | 0.000 | 14,623 | 0.035 | 0.009 | 0.001 | 0.0020 | 0.0006 | 0.001 | -5.85E-05 | 1.035E-05 | 0.000 |
| 1993 | 2,791,293 | 11,405,363 | 17,131 | 13,861 | 3,270 | 53,533 | 94 | -1.96 | 0.035 | 0.000 | 14,690 | 0.035 | 0.008 | 0.000 | 0.0022 | 0.0005 | 0.000 | -6.17E-05 | 9.04E-06 | 0.000 |
| 1994 | 3,027,813 | 11,548,661 | 18,840 | 14,578 | 4,262 | 56,293 | 93 | -1.86 | 0.038 | 0.000 | 15,994 | 0.030 | 0.009 | 0.002 | 0.0025 | 0.0005 | 0.000 | -6.8E-05 | 9.701E-06 | 0.000 |
| 1995 | 3,197,445 | 11,705,753 | 14,219 | 13,352 | 867 | 66,829 | 95 | -2.04 | 0.030 | 0.000 | 13,932 | 0.064 | 0.007 | 0.000 | 0.0009 | 0.0004 | 0.049 | -4.05E-05 | 7.765E-06 | 0.000 |
| 1996 | 3,317,465 | 11,828,476 | 14,935 | 14,205 | 730 | 68,214 | 95 | -2.02 | 0.030 | 0.000 | 14,164 | 0.061 | 0.007 | 0.000 | 0.0011 | 0.0004 | 0.012 | -4.6E-05 | 7.69E-06 | 0.000 |
| 1997 | 3,383,693 | 11,918,856 | 13,888 | 13,899 | -11 | 68,471 | 94 | -2.05 | 0.033 | 0.000 | 13,770 | 0.064 | 0.008 | 0.000 | 0.0012 | 0.0005 | 0.013 | -5.09E-05 | 8.397E-06 | 0.000 |
| 1998 | 2,962,907 | 11,986,041 | 12,568 | 12,864 | -296 | 52,437 | 93 | -2.15 | 0.031 | 0.000 | 12,439 | 0.065 | 0.007 | 0.000 | 0.0009 | 0.0004 | 0.061 | -4.59E-05 | 7.912E-06 | 0.000 |
| 1999 | 2,976,642 | 12,026,571 | 12,967 | 12,473 | 494 | 52,840 | 93 | -2.15 | 0.031 | 0.000 | 12,413 | 0.060 | 0.007 | 0.000 | 0.0013 | 0.0004 | 0.006 | -5.48E-05 | 7.965E-06 | 0.000 |

| Population characteristics | | | Comparison of actual CVD hospitalization rates per 100,000 persons at age 65 and 66 | | | Results and coefficients of third degree polynomial regression model | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total CVD hospitalizations | Total population | Rate at age 65 | Rate at age 66 | Difference in rates at age 65 and 66 | Maximum predicted CVD hospitalization rate per 100,000 persons | Age at maximum rate | β0 | β0_SE | *P* | Predicted hospitalization rate at age 65 per 100,000 persons | β1 | β1_SE | *P* | β2 | β2_SE | *P* | β3 | β3_SE | *P* |
| 2000 | 3,002,344 | 12,120,455 | 12,093 | 13,746 | -1,653 | 51,667 | 92 | -2.13 | 0.030 | 0.000 | 12,553 | 0.054 | 0.007 | 0.000 | 0.0017 | 0.0004 | 0.000 | -6.43E-05 | 7.704E-06 | 0.000 |
| 2001 | 3,172,954 | 12,235,706 | 14,964 | 13,760 | 1,204 | 55,613 | 92 | -2.00 | 0.027 | 0.000 | 14,075 | 0.031 | 0.006 | 0.000 | 0.0031 | 0.0004 | 0.000 | -8.75E-05 | 7.033E-06 | 0.000 |
| 2002 | 3,291,084 | 12,314,122 | 15,208 | 14,491 | 718 | 57,184 | 92 | -1.94 | 0.025 | 0.000 | 14,714 | 0.025 | 0.006 | 0.000 | 0.0035 | 0.0004 | 0.000 | -9.49E-05 | 6.37E-06 | 0.000 |
| 2003 | 3,837,205 | 12,435,296 | 18,231 | 15,864 | 2,367 | 73,973 | 93 | -1.80 | 0.029 | 0.000 | 16,761 | 0.010 | 0.007 | 0.156 | 0.0048 | 0.0004 | 0.000 | -0.000116 | 7.308E-06 | 0.000 |
| 2004 | 3,812,298 | 12,558,430 | 20,286 | 15,460 | 4,825 | 73,149 | 93 | -1.74 | 0.035 | 0.000 | 17,471 | -0.008 | 0.008 | 0.352 | 0.0058 | 0.0005 | 0.000 | -0.000131 | 9.064E-06 | 0.000 |
| 2005 | 3,826,143 | 12,712,212 | 20,198 | 14,892 | 5,305 | 74,024 | 93 | -1.76 | 0.038 | 0.000 | 17,129 | -0.010 | 0.009 | 0.288 | 0.0060 | 0.0005 | 0.000 | -0.000135 | 9.766E-06 | 0.000 |
| 2006 | 3,856,969 | 12,895,410 | 20,707 | 14,837 | 5,870 | 73,457 | 93 | -1.75 | 0.041 | 0.000 | 17,292 | -0.013 | 0.009 | 0.185 | 0.0061 | 0.0006 | 0.000 | -0.000135 | 1.05E-05 | 0.000 |
| **White, overall** | | | | | | | | | | | | | | | | | | | | |
| 1991 | 5,833,586 | 27,357,348 | 10,679 | 11,236 | -557 | 45,340 | 94 | -2.26 | 0.033 | 0.000 | 11,086 | 0.055 | 0.008 | 0.000 | 0.0013 | 0.0005 | 0.011 | -4.98E-05 | 8.447E-06 | 0.000 |
| 1992 | 6,270,023 | 27,716,145 | 14,725 | 11,695 | 3,030 | 47,902 | 93 | -2.10 | 0.039 | 0.000 | 12,664 | 0.032 | 0.009 | 0.001 | 0.0026 | 0.0006 | 0.000 | -7.15E-05 | 9.949E-06 | 0.000 |
| 1993 | 6,554,029 | 28,105,524 | 15,143 | 11,929 | 3,214 | 49,424 | 93 | -2.09 | 0.040 | 0.000 | 12,854 | 0.031 | 0.009 | 0.002 | 0.0028 | 0.0006 | 0.000 | -7.62E-05 | 1.012E-05 | 0.000 |
| 1994 | 7,164,284 | 28,363,181 | 16,811 | 12,757 | 4,054 | 51,919 | 93 | -1.99 | 0.039 | 0.000 | 14,108 | 0.029 | 0.009 | 0.003 | 0.0029 | 0.0006 | 0.000 | -7.98E-05 | 9.956E-06 | 0.000 |
| 1995 | 7,604,373 | 28,618,520 | 12,912 | 11,773 | 1,139 | 60,393 | 95 | -2.16 | 0.031 | 0.000 | 12,340 | 0.064 | 0.007 | 0.000 | 0.0011 | 0.0004 | 0.016 | -4.74E-05 | 7.813E-06 | 0.000 |
| 1996 | 7,918,958 | 28,808,986 | 13,525 | 12,771 | 754 | 62,600 | 94 | -2.13 | 0.031 | 0.000 | 12,648 | 0.060 | 0.007 | 0.000 | 0.0015 | 0.0004 | 0.002 | -5.61E-05 | 7.995E-06 | 0.000 |
| 1997 | 8,116,505 | 28,921,260 | 12,592 | 12,610 | -17 | 63,938 | 94 | -2.15 | 0.030 | 0.000 | 12,403 | 0.063 | 0.007 | 0.000 | 0.0016 | 0.0004 | 0.001 | -5.87E-05 | 7.702E-06 | 0.000 |
| 1998 | 6,950,499 | 28,975,459 | 11,450 | 11,639 | -189 | 48,796 | 93 | -2.24 | 0.027 | 0.000 | 11,297 | 0.061 | 0.006 | 0.000 | 0.0013 | 0.0004 | 0.003 | -5.48E-05 | 7.032E-06 | 0.000 |
| 1999 | 7,003,393 | 28,959,951 | 11,867 | 11,468 | 399 | 49,789 | 93 | -2.23 | 0.028 | 0.000 | 11,374 | 0.055 | 0.007 | 0.000 | 0.0018 | 0.0004 | 0.000 | -6.38E-05 | 7.281E-06 | 0.000 |
| 2000 | 7,112,042 | 29,066,742 | 11,172 | 12,657 | -1,484 | 49,545 | 92 | -2.21 | 0.028 | 0.000 | 11,594 | 0.050 | 0.006 | 0.000 | 0.0021 | 0.0004 | 0.000 | -7.11E-05 | 7.109E-06 | 0.000 |
| 2001 | 7,494,864 | 29,398,331 | 13,717 | 12,725 | 992 | 51,521 | 92 | -2.07 | 0.024 | 0.000 | 13,002 | 0.031 | 0.005 | 0.000 | 0.0031 | 0.0003 | 0.000 | -8.7E-05 | 6.092E-06 | 0.000 |
| 2002 | 7,758,865 | 29,449,253 | 14,072 | 13,463 | 609 | 53,060 | 92 | -2.02 | 0.021 | 0.000 | 13,698 | 0.026 | 0.005 | 0.000 | 0.0034 | 0.0003 | 0.000 | -9.17E-05 | 5.364E-06 | 0.000 |
| 2003 | 9,277,736 | 29,590,371 | 16,994 | 14,865 | 2,129 | 71,056 | 93 | -1.87 | 0.025 | 0.000 | 15,700 | 0.012 | 0.006 | 0.041 | 0.0046 | 0.0004 | 0.000 | -0.000112 | 6.439E-06 | 0.000 |
| 2004 | 9,207,303 | 29,730,665 | 18,934 | 14,494 | 4,439 | 70,297 | 93 | -1.82 | 0.034 | 0.000 | 16,311 | -0.001 | 0.008 | 0.854 | 0.0054 | 0.0005 | 0.000 | -0.000123 | 8.78E-06 | 0.000 |
| 2005 | 9,176,559 | 29,938,905 | 18,688 | 14,006 | 4,682 | 71,064 | 93 | -1.84 | 0.038 | 0.000 | 15,904 | -0.001 | 0.009 | 0.912 | 0.0054 | 0.0005 | 0.000 | -0.000122 | 9.692E-06 | 0.000 |
| 2006 | 9,219,346 | 30,221,107 | 19,126 | 13,904 | 5,222 | 70,539 | 93 | -1.84 | 0.042 | 0.000 | 15,946 | -0.002 | 0.010 | 0.831 | 0.0054 | 0.0006 | 0.000 | -0.000121 | 1.063E-05 | 0.000 |

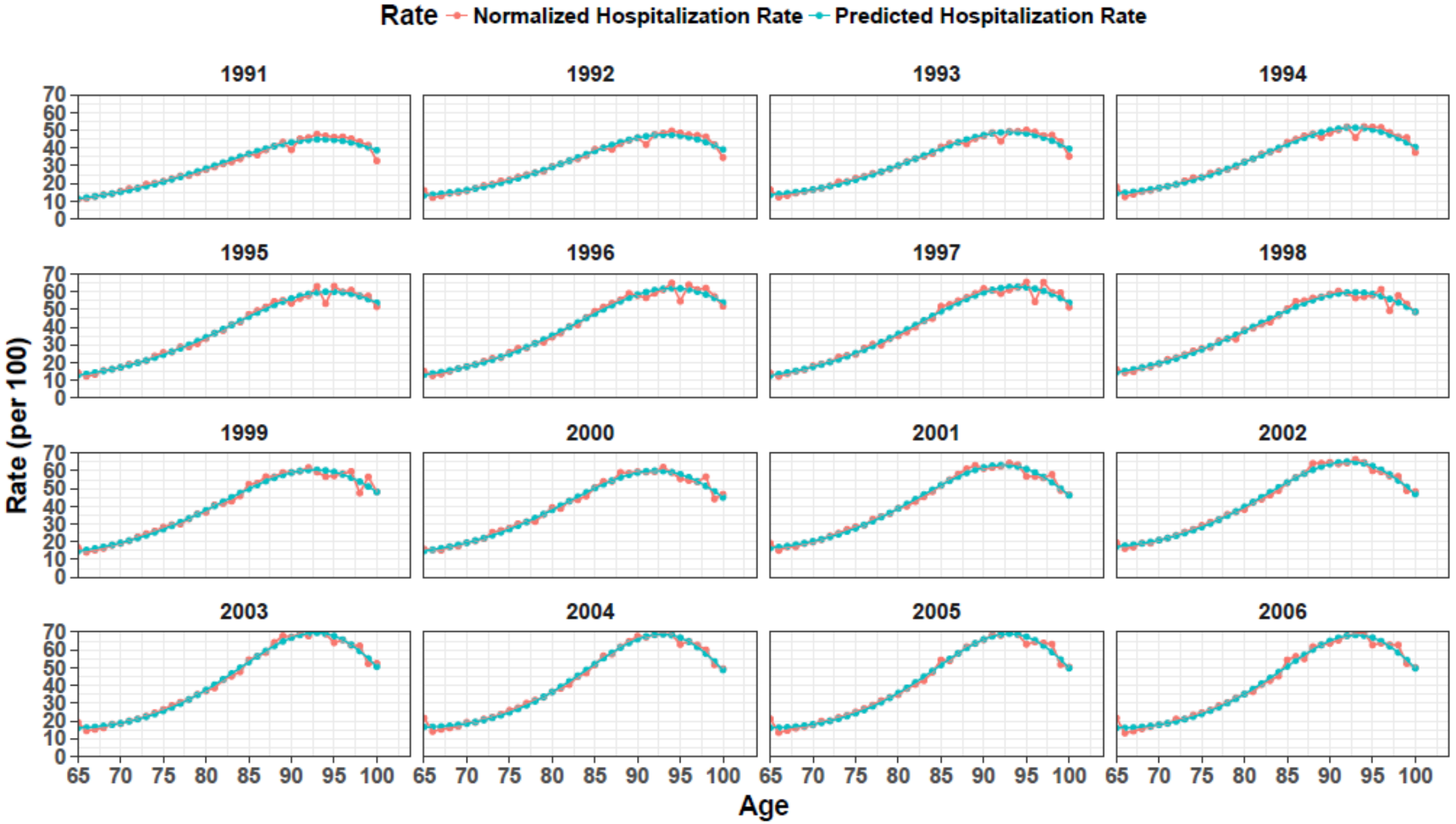


**Figure S1. Distributions of CVD hospitalization rates per 100,000 adults, by single year of age and calendar year between 1991-2006 in US adults aged 65 and above, based on data from the U.S. Centers for Medicare & Medicaid Services. Actual year-specific hospitalization rates are shown in orange; rates predicted by third-degree polynomial regression are shown in blue.**

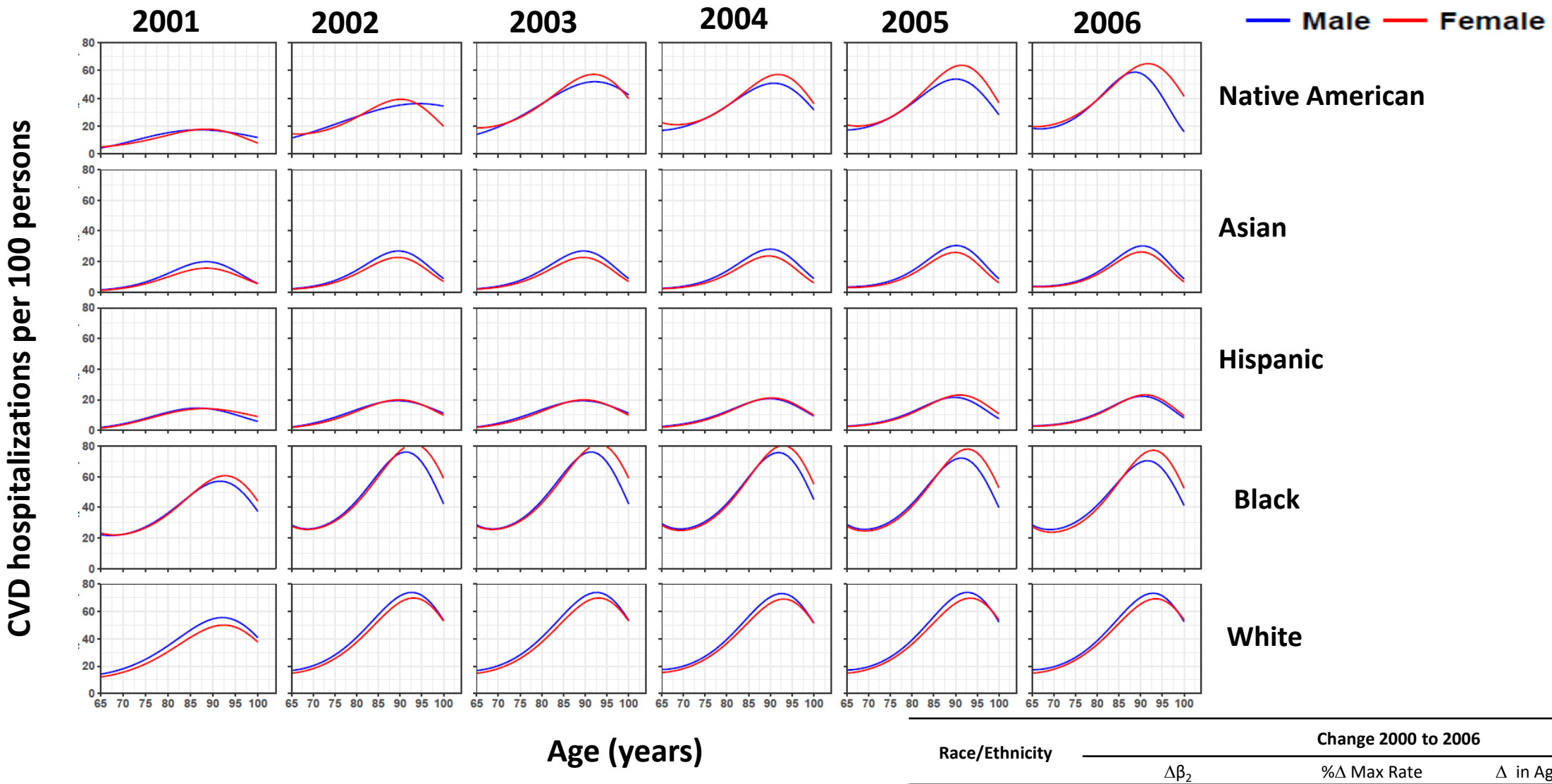


**Figure S2. Single-year age distributions of CVD-related hospitalization rates per 100 persons among the US elderly from 2001-2006 by race and sex.**

| Race/Ethnicity | Change 2000 to 2006 | | |
|---|---|---|---|
| | $\Delta\beta_2$ | %Δ Max Rate | Δ in Age at Max Rate (yr) |
| **Native American** | 5x | 220% | 4 |
| **Asian** | 11x | 50% | 2 |
| **Hispanic** | 7x | 50% | 2 |
| **Black** | 1.8x | 20% | 1 |
| **White** | 2.5x | 12% | 1 |