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Executive Summary: Heart Disease and Stroke Statistics-2015 Update A Report From the American Heart Association

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Executive Summary: Heart Disease and Stroke Statistics—2015 Update

A Report From the American Heart Association

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The 2015 Statistical Update full text is available online at http://circ.ahajournals.org/content/131/4/e29.full.

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Summary

Each year, the American Heart Association (AHA), in conjunction with the Centers for Disease Control and Prevention, the National Institutes of Health, and other government agencies, brings together the most up-to-date statistics related to heart disease, stroke, and other cardiovascular and metabolic diseases and presents them in its Heart Disease and Stroke Statistical Update. The Statistical Update represents a critical resource for the lay public, policy makers, media professionals, clinicians, healthcare administrators, researchers, and others seeking the best available data on these conditions. Together, cardiovascular disease (CVD) and stroke produce immense health and economic burdens in the United States and globally. The Statistical Update brings together in a single document up-to-date information on the core health behaviors and health factors that define cardiovascular health; a range of major clinical disease conditions (including stroke, congenital heart disease, rhythm disorders, subclinical atherosclerosis, coronary heart disease, heart failure, valvular disease, and peripheral arterial disease); and the associated outcomes (including quality of care, procedures, and economic costs). Since 2009, the annual versions of the Statistical Update have been cited >20 000 times in the literature. In 2014 alone, the various Statistical Updates were cited >5700 times.

Each annual version of the Statistical Update undergoes major revisions to include the newest nationally representative data, add additional relevant published scientific findings, remove older information, add new sections or chapters, and increase the number of ways to access and use the assembled information. This year-long process, which begins as soon as the previous Statistical Update is published, is performed by the AHA Statistics Committee faculty volunteers and staff. For example, this year's edition includes a new chapter on cardiac arrest, new data on the monitoring and benefits of cardiovascular health in the population, additional information in many chapters on the global CVD and stroke burden, and further new focus on evidence-based approaches to changing behaviors, implementation strategies, and implications of the AHA's 2020 Impact Goals. Below are a few highlights from this year's Update.

Current Status of Cardiovascular Health in the United States (Chapter 2)

- The concept of cardiovascular health represents a heightened focus for the AHA, with 3 central and novel emphases:
  - —An expanded focus on not only CVD prevention but also promotion of positive cardiovascular health, in addition to the treatment of established CVD.
  - —The prioritization of both health behaviors (healthy diet pattern, appropriate energy intake, physical activity [PA], and nonsmoking) and health factors (optimal blood lipids, blood pressure, glucose levels) throughout the lifespan as primary goals unto themselves.
  - —Population-level health promotion strategies to shift the majority of the public toward greater cardiovascular health, in addition to targeting those individuals at greatest CVD risk, because CVD occurs at all risk levels across the population and because healthy lifestyles are uncommon throughout the US population.
- The prevalence of ideal cardiovascular health is higher in US children and young adults than in US middle-aged and older adults, largely because of the higher prevalence of ideal levels of health factors in US children and young adults. However, with regard to health behaviors, children and young adults were similar to (PA) or worse than (diet) middle-aged and older adults. Poor diet and physical inactivity in childhood and younger age are strong predictors of suboptimal health factors later in life.
- Approximately 50% of US children 12 to 19 years of age have ≥5 metrics at ideal levels, with lower prevalence in girls (47%) than in boys (52%).
- Only 18% of US adults have ≥5 metrics with ideal levels, with lower prevalence in men (11%) than in women (25%).
- Among children, the prevalence of ideal levels of cardiovascular health behaviors and factors currently varies from <1% for the healthy diet pattern (ie, <1 in 100 US children meets at least 4 of the 5 dietary components) to >80% for the smoking, blood pressure, and fasting glucose metrics.
- Among US adults, the prevalence of ideal levels of cardiovascular health behaviors and factors currently varies from 0.5% for the healthy diet pattern to up to 78% for the smoking metric (never having smoked or being a former smoker who has quit for >12 months).

Effective Approaches to Improve Cardiovascular Health (Chapter 2)

- The current evidence supports a range of complementary strategies to improve cardiovascular health, including:
  - —Individual-focused approaches, which target lifestyle and treatments at the individual level
  - —Healthcare systems approaches, which encourage, facilitate, and reward efforts by providers to improve health behaviors and health factors
  - —Population approaches, which target lifestyle and treatments in schools or workplaces, local communities, and states, as well as throughout the nation
- Such approaches can focus on both (1) improving cardiovascular health among those who currently have less than

optimal levels and (2) preserving cardiovascular health among those who currently have ideal levels (in particular, children, adolescents, and young adults) as they age.
- The metrics with the greatest potential for improvement are health behaviors, including diet quality, PA, and body weight. However, each of the cardiovascular health metrics can be improved and deserves major focus.
- The AHA has a broad range of policy initiatives to improve cardiovascular health among all Americans and meet the 2020 Strategic Impact Goals.

Health Behaviors (Chapters 3 to 6)

Based on comparable risk assessment methods, poor lifestyle behaviors and lifestyle-related risk factors are the foremost causes of death and disability in the United States and in the world.

Smoking/Tobacco Use (Chapter 3)

- Although tobacco use has declined substantially in the United States, it remains the second-leading cause of total deaths and disability. The percentage of adults who reported current cigarette use declined from 24.1% in 1998 to 17.9% in 2013; among high school students, the decline was from 36.4% in 1997 to 15.7% in 2013. Still, almost one third of coronary heart disease deaths are attributable to smoking and exposure to secondhand smoke.
- Declines in tobacco usage in the United States may be threatened by the >250 e-cigarette products that were available in 2014. To date, the risks and benefits of e-tobacco products remain controversial but are an area of intense investigation by scientists, as well as scrutiny by the US Food and Drug Administration. Public health experts are concerned that e-cigarettes may be a gateway to smoking traditional cigarettes and may be eroding gains in the public's awareness of the harms of tobacco products.
- Annual smoking-attributable economic costs in the United States, including direct medical costs and lost productivity, are estimated to exceed $289 billion.

Physical Inactivity (Chapter 4)

- In 2013, 15.2% of adolescents reported being inactive during the prior week, and inactivity was more likely to be reported by girls (19.2%) than boys (11.2%). Inactivity was more commonly reported by black (27.3%) and Hispanic (20.3%) girls than their white counterparts (16.1%); similarly, black (15.2%) and Hispanic (12.1%) boys reported more inactivity than white boys (9.2%).
- According to 2013 National Health Interview Survey data, only half of American adults met the current aerobic PA guidelines (≥150 minutes of moderate PA or 75 minutes of vigorous PA or an equivalent combination each week). Women (46.1%) were less likely to meet the guidelines than men (54.2%), and non-Hispanic blacks (41.4%) and Hispanics (42.9%), were less likely to meet them than non-Hispanic whites (53.4%).
- Unfortunately, the proportion of individuals meeting PA recommendations is likely to be lower than indicated by self-report data. Studies examining actual (with accelerometers, pedometers, etc) versus self-reported PA indicate that both men and women overestimate their PA substantially (by 44% and 138% for men and women, respectively).

Nutrition (Chapter 5)

- The leading risk factor for death and disability in the United States is suboptimal diet quality, which in 2010 led to 678 000 annual deaths of all causes. Major contributors were insufficient intakes of fruits, nuts/seeds, whole grains, vegetables, and seafood, as well as excess intakes of sodium. In the United States, an estimated 58 000 annual CVD deaths (95% confidence interval, 37 000–80 000) in 2010 were attributable to sodium intake >2.0 g/d, representing 1 in 16 (6.3%) of all CVD deaths and 1 in 8 (13.1%) CVD deaths before age 70 years. Globally, an estimated 1.65 million annual CVD deaths (95% confidence interval, 1.10–2.22) were attributable to sodium intake >2.0 g/d, representing nearly 1 in 10 (9.5%) of all CVD deaths.
- Although healthier diets cost modestly more than unhealthful diets, comparing extremes of unhealthful versus healthful food-based diet patterns, the more healthful patterns cost on average ≈$1.50 per day more. Similarly priced options are also common; in a comparison of 20 fruits and vegetables versus 20 common snack foods such as cookies, chips, pastries, and crackers, the average price per portion of fruits and vegetables was 31 cents, with an average of 57 calories per portion, versus 33 cents and 183 calories per portion for snack foods.

Obesity (Chapter 6)

- Although the overall prevalence of obesity in US youth did not change between 2003 to 2004 and 2011 to 2012, the prevalence decreased among those aged 2 to 5 years. Obesity decreased among those of higher socioeconomic status but increased among those of lower socioeconomic status. In addition, the overall prevalence of severe obesity in US youth continued to increase, especially among adolescent boys.
- Overweight and obesity predispose individuals to most major risk factors, including physical inactivity, hypertension, hyperlipidemia, and diabetes mellitus.
- Excess body weight is among the leading causes of death and disability in the United States and globally, with burdens expected to increase in coming years.
- Among overweight and obese individuals, existing cardiometabolic risk factors should be monitored and treated intensively with diet quality, PA, and pharmacological or other treatments as necessary. Each of these interventions provides benefits independent of weight loss and maintenance.

Health Factors and Other Risk Factors (Chapters 7 to 12)

The prevalence and control of cardiovascular health factors and risks remains a major issue for many Americans.

Family History and Genetics (Chapter 7)

- Familial aggregation of CVD is related to the clustering of specific lifestyle factors and risk factors, both of which have environmental and genetic contributors. Patients with a family history of coronary artery disease have a higher prevalence of traditional CVD risk factors, underscoring opportunities for prevention.
- The risk of most CVD conditions is higher in the presence of a family history, including CVD (45% higher odds with sibling history), stroke (50% higher odds with history in

a first-degree relative), atrial fibrillation (AF, 80% higher odds with parental history), heart failure (70% higher odds with parental history), and peripheral arterial disease (80% higher odds with family history).

High Blood Cholesterol and Other Lipids (Chapter 8)

- 75.7% of children and 46.6% of adults have ideal cholesterol levels (untreated total cholesterol <170 mg/dL for children and <200 mg/dL for adults). Prevalence of ideal levels has improved over the past decade in children but remained the same in adults.
- According to 2009 to 2012 data, >100 million US adults ≥20 years of age have total cholesterol levels ≥200 mg/dL; almost 31 million have levels ≥240 mg/dL.

High Blood Pressure (Chapter 9)

- Based on 2009 to 2012 data, 32.6% of US adults ≥20 years of age have hypertension, which represents ≈80.0 million US adults. African American adults have among the highest prevalence of hypertension in the world. Among non-Hispanic black men and women, the age-adjusted prevalence of hypertension was 44.9% and 46.1%, respectively.
- National Health and Nutrition Examination Survey (NHANES) data from 2009 to 2012 revealed that among US adults with hypertension, 54.1% were controlled, 76.5% were currently treated, 82.7% were aware they had hypertension, and 17.3% were undiagnosed.

Diabetes Mellitus (Chapter 10)

- Diabetes mellitus affects 1 in 10 US adults, with 90% to 95% of cases being type 2 diabetes mellitus. Diabetes mellitus disproportionately affects racial/ethnic minorities. Type 2 diabetes mellitus is increasingly common in children and adolescents; the disease historically was diagnosed primarily in adults ≥40 years of age. The prevalence of type 2 diabetes mellitus in children/adolescents has increased by 30.5% between 2001 and 2009, and it now constitutes ≈50% of all childhood diabetes mellitus.
- Diabetes mellitus is associated with reduced longevity, with men with diabetes mellitus living an average of 7.5 years and women with diabetes mellitus living an average of 8.2 years less than their counterparts without diabetes mellitus.

Metabolic Syndrome (Chapter 11)

- From 1999 to 2010, the age-adjusted national prevalence of metabolic syndrome in the United States peaked (in the 2001–2002 cycle) and began to fall. This is attributable to decreases in the age-adjusted prevalence among women and no change in men. In addition, there has been variation in the trends over time for each individual component of the metabolic syndrome. Generally, the national prevalences of hypertriglyceridemia and elevated blood pressure have decreased, whereas hyperglycemia and elevated waist circumference have increased. However, these trends also vary significantly by sex and race/ethnicity.

Cardiovascular Conditions/Diseases (Chapters 13 to 22)

Rates of death attributable to CVD have declined in the United States, but the burden remains high.

Total Cardiovascular Diseases (Chapter 13)

- The 2011 overall rate of death attributable to CVD was 229.6 per 100 000 Americans. The death rates were 275.7 for males and 192.3 for females. The rates were 271.9 for white males, 352.4 for black males, 188.1 for white females, and 248.6 for black females.
- From 2001 to 2011, death rates attributable to CVD declined 30.8%. In the same 10-year period, the actual number of CVD deaths per year declined by 15.5%. Yet in 2011, CVD still accounted for 31.3% (786 641) of all 2 515 458 deaths, or ≈1 of every 3 deaths in the United States.
- On the basis of 2011 death rate data, >2150 Americans die of CVD each day, an average of 1 death every 40 seconds. Approximately 155 000 Americans who died of CVD in 2011 were <65 years of age. In 2011, 34% of deaths attributable to CVD occurred before the age of 75 years, which is younger than the current average life expectancy of 78.7 years.

Stroke (Chapter 14)

- From 2001 to 2011, the relative rate of stroke death fell by 35.1% and the actual number of stroke deaths declined by 21.2%. Yet each year, ≈795 000 people continue to experience a new or recurrent stroke (ischemic or hemorrhagic). Approximately 610 000 of these are first events and 185 000 are recurrent stroke events. In 2011, stroke caused ≈1 of every 20 deaths in the United States. On average, every 40 seconds, someone in the United States has a stroke, and someone dies of one approximately every 4 minutes.
- The decline in stroke mortality over the past decades, a major improvement in population health observed for both sexes and all race and age groups, has resulted from reduced stroke incidence and lower case fatality rates. The significant improvements in stroke outcomes are concurrent with cardiovascular risk factor control interventions. The hypertension control efforts initiated in the 1970s appear to have had the most substantial influence on the accelerated decline in stroke mortality, with lower blood pressure distributions in the population. Control of diabetes mellitus and high cholesterol and smoking cessation programs, particularly in combination with hypertension treatment, also appear to have contributed to the decline in stroke mortality.

Atrial Fibrillation (Chapter 16)

- Multiple lines of evidence have increased awareness of the burden of unrecognized AF. In individuals without a history of AF with recent pacemaker or defibrillator implantation, subclinical atrial tachyarrhythmias were detected in 10.1% of patients. Subclinical atrial tachyarrhythmias were associated with a 5.6-fold higher risk of clinical AF and ≈13% of ischemic strokes or embolism. A recent systematic review suggested that one needs to screen 170 community-based individuals at least 65 years of age to detect 1 case of AF.

Sudden Cardiac Arrest (Chapter 17)

- In 2011, ≈326 200 people experienced emergency medical services–assessed out-of-hospital cardiac arrests in the United States. Survival to hospital discharge after nontraumatic EMS-treated cardiac arrest with any first recorded rhythm was 10.6% for patients of any age. Of the 19 300 bystander-witnessed out-of-hospital cardiac arrests in 2011, 31.4% of victims survived.
- Each year, ≈209 000 people are treated for in-hospital cardiac arrest.

Coronary Heart Disease (Chapter 19)

- Coronary heart disease alone caused ≈1 of every 7 deaths in the United States in 2011. In 2011, 375 295 Americans died of coronary heart disease. Each year, an estimated ≈635 000 Americans have a new coronary attack (defined as first hospitalized myocardial infarction or coronary heart disease death) and ≈300 000 have a recurrent attack. It is estimated that an additional 155 000 silent first myocardial infarctions occur each year. Approximately every 34 seconds, 1 American has a coronary event, and approximately every 1 minute 24 seconds, an American will die of one.

Heart Failure (Chapter 20)

- In 2011, 1 in 9 death certificates (284 388 deaths) in the United States mentioned heart failure. Heart failure was the underlying cause in 58 309 of those deaths. The number of any-mention deaths attributable to heart failure was approximately as high in 1995 (287 000) as it was in 2011 (284 000). Additionally, hospital discharges for heart failure remained stable from 2000 to 2010, with first-listed discharges of 1 008 000 and 1 023 000, respectively.

Cardiovascular Quality of Care, Procedure Utilization, and Costs (Chapters 23 to 25)

The Statistical Update provides critical data in several sections on the magnitude of healthcare delivery and costs, as well as the quality of healthcare delivery, related to CVD risk factors and conditions.

Quality-of-Care Metrics for CVD (Chapter 23)

- The Institute of Medicine has identified 6 domains of quality of care, including safety, effectiveness, patient-centered care, timely care, efficiency, and equitable care.
- According to the Medicare Patient Safety Monitoring System, between 2005 and 2011, adverse event rates in hospitalized patients declined for both myocardial infarction (from 5.0% to 3.7%) and congestive heart failure (from 3.7% to 2.7%)
- However, in the American College of Cardiology's Practice Innovation and Clinical Excellence (PINNACLE) outpatient registry, only 66.5% of eligible patients with coronary artery disease received the optimal evidenced-based combination of medications.
- A randomized trial of post–acute coronary care syndrome that used multiple modalities to enhance adherence to 4 indicated medications (clopidogrel, statins, angiotensin-converting enzyme inhibitors/angiotensin receptor blockers, and β-blockers) demonstrated better adherence in the intervention group (89.3% versus 73.9%) at 1 year.
- Similarly, challenges persist in the outpatient setting, in discussion and counseling for PA and dietary habits.

Cardiovascular Procedure Use and Costs (Chapters 24 and 25)

- The total number of inpatient cardiovascular operations and procedures increased 28% between 2000 and 2010, from 5 939 000 to 7 588 000.
- According to the 2012 National Healthcare Cost and Utilization Project statistics, the mean hospital charge for a vascular or cardiac surgery or procedure in 2012 was $78 897: cardiac revascularization cost $149 480, and percutaneous interventions cost ≈$70 027.
- For 2011, the estimated annual costs for CVD and stroke were $320.1 billion, including $195.6 billion in direct costs (hospital services, physicians and other professionals, prescribed medications, home health care, and other medical durables) and $124.5 billion in indirect costs from lost future productivity (cardiovascular and stroke premature deaths). CVD costs more than any other diagnostic group.
- By comparison, in 2009, the estimated cost of all cancer and benign neoplasms was $216.6 billion ($86.6 billion in direct costs and $130 billion in mortality indirect costs).

Conclusions

The AHA, through its Statistics Committee, continuously monitors and evaluates sources of data on heart disease and stroke in the United States to provide the most current information available in the Statistical Update. This annual Statistical Update is the product of a full year's worth of effort by dedicated volunteer physicians and scientists, committed government professionals, and outstanding AHA staff members, without whom publication of this valuable resource would be impossible. Their contributions are gratefully acknowledged.

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Note: Population data used in the compilation of NHANES prevalence estimates are for the latest year of the NHANES survey being used. Extrapolations for NHANES prevalence estimates are based on the census resident population for 2012 because this is the most recent year of NHANES data used in the Statistical Update.

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*Modest.

†Significant.