

**COMMUNITY PLAN**  
**FOR IMPROVING CARDIOVASCULAR HEALTH**

***FOUNDATION FOR CARDIOVASCULAR HEALTH***

***THE FOUNDATION FOR CARDIOVASCULAR HEALTH AND PIMA HEART ASSOCIATES  
WISHES TO THANK THE FOLLOWING BOARD MEMBERS FOR THEIR PREPARATION  
OF THE COMMUNITY PLAN:***

***HAL STRICH, MS  
LANE P. JOHNSON, MD, MPH  
NANCY J. JOHNSON, RN, PHD***

***FALL, 2006***

### ***A Message from the Chair of the Board of Directors***

Cardiovascular disease is the leading cause of death in the United States and throughout the world. In Arizona, heart disease and stroke are responsible for one of every three deaths. Heart disease and stroke are the leading causes of death for both men and women, and for all racial and ethnic groups. Significant disparities continue to exist for different groups, especially the poor and minorities. Heart disease and stroke are increasing among persons age 35 and younger, along with a rise in conditions such as diabetes and obesity. Cardiovascular disease is projected to increase further as the population ages and the number of older Americans increases.

Risk factors for heart disease and stroke related to behavior and lifestyle and have been established for many years: hypertension, tobacco use, high blood cholesterol, physical inactivity, being overweight, or obese, diabetes, and poor nutrition. There is strong evidence that these behaviors can be modified and that reducing risk factors will result in declines in cardiovascular disease death rates. In spite of proven interventions, these risk factors continue to threaten our health.

The Community Plan for Cardiovascular Health is intended to describe the magnitude and scope of major cardiovascular disease, delineate modifiable risk factors and research supporting this evidence, and put forth recommended actions to reduce the impact of major cardiovascular disease on our health and well-being. Recommendations include health promotion and early education programs that address prevention and healthy lifestyle choices, early detection of risk factors and access to medical care, and environmental policies in schools, communities, and worksites that promote tobacco control, good nutrition, and physical activity.

The Community Plan is intended to guide community agencies and organizations, educators, health care professionals, and community leaders in developing effective programs and services against major cardiovascular disease. The Foundation for Cardiovascular Health is committed to reducing the destructive impact of this epidemic, supporting agencies, organizations and individuals, and building a heart-healthy community.

David Lapan, MD  
Chair, Board of Directors  
Foundation for Cardiovascular Health  
Tucson, Arizona

### ***About the Foundation for Cardiovascular Health***

**The Foundation for Cardiovascular Health** was established locally as a 501(C)3 nonprofit community foundation in 1996. It is governed by a community board and has a mission to improve the heart health of our community. All funding is from grants, corporate gifts and community contributions.

The Foundation for Cardiovascular Health provides many community services:

- College Scholarships for high school students interested in heart disease prevention.
- Heart Health Classes designed to help patients live as healthy as possible with their heart disease.
- Research funding for clinical/optimizing heart health studies.
- Various heart health classes and programs including exercise, nutrition, tai chi and yoga.
- Stipends for patients needing cardiac rehabilitation, nutritional consultations, and exercise consults, and having no resources to pay.
- Community education seminars.
- Heart Health presentations and seminars for business and organizations.

The Foundation has organized a number of community conferences on Optimizing Heart Health featuring such notable health leaders and advocates as Deepak Chopra, Bernie Siegel, Patch Adams, Wayne Dyer and Kenneth Cooper.

**For more information, go to our website: [www.hearthealthy.org](http://www.hearthealthy.org)**

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# FOUNDATION FOR CARDIOVASCULAR HEALTH

## COMMUNITY PLAN FOR IMPROVING CARDIOVASCULAR HEALTH

### I. EPIDEMIOLOGY OF CARDIOVASCULAR DISEASE

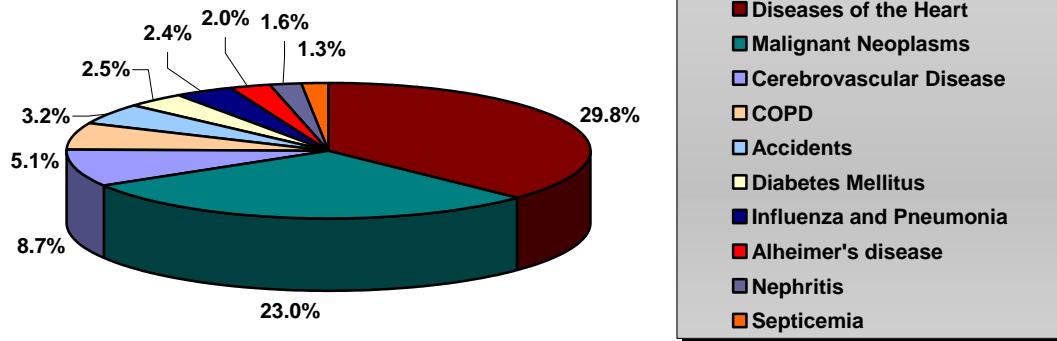
#### SCOPE OF THE PROBLEM

##### *Backgrounds and Trends*

Cardiovascular disease is the leading cause of death in the United States<sup>1</sup> and throughout the world<sup>2</sup>. Heart disease and stroke, the principle categories of cardiovascular disease, comprise almost 40% of all deaths in the United States, almost 953,000 deaths each year<sup>1</sup>. Every 29 seconds, someone in the U.S. will suffer a coronary event, and every 60 seconds someone will die from a coronary event<sup>44</sup>.

#### Leading Causes of Death in the United States

Leading Causes and Percent of Deaths,  
United States, FY 2003



## Leading Causes of Death in Arizona

Mortality patterns in Arizona generally reflect those of the United States.

Rank	Causes of Death: 2004	Number of Deaths	Percent of Deaths
1	Diseases of heart	10,402	24.3%
2	Malignant neoplasms	9,506	22.2%
3	Accidents (unintentional injury)	2,641	6.2%
4	Cerebrovascular diseases	2,412	5.6%
5	Chronic lower respiratory diseases	2,392	5.6%
6	Alzheimer's disease	1,672	3.9%
7	Diabetes mellitus	1,180	2.8%
8	Influenza and pneumonia	1,108	2.6%
9	Intentional self-harm (suicide)	854	2.0%
10	Chronic liver disease and cirrhosis	629	1.5%
11	Nephritis, nephrotic syndrome and nephrosis*	625	1.5%
12	Assault (homicide)	486	1.1%
	All Causes	42,806	100.0%

### Heart Disease: Diagnoses

Ischemic heart disease accounts for more than three-quarters (75.6%) of all heart disease deaths in Arizona. Other diagnoses are listed below.

### HEART DISEASE: NUMBER, PERCENT AND AGE-ADJUSTED RATE PER 100,000 POP, ARIZONA, 2003.

	No.	%	Rate
<b>Diseases of the heart</b>	10,551	100.0%	192.8
<b>Ischemic heart disease</b>	7,962	75.5%	145.5
<b>Acute rheumatic fever and chronic rheumatic heart disease</b>	46	0.4%	0.8
<b>Heart failure</b>	631	6.0%	11.5
<b>Hypertensive heart disease</b>	431	4.1%	7.9
<b>Hypertensive heart and renal disease</b>	31	0.3%	0.6
<b>Acute and subacute endocarditis</b>	20	0.2%	0.4
<b>Diseases of the pericardium and acute myocarditis</b>	17	0.2%	0.3
<b>Other heart diseases</b>	2,081	19.7%	38.0
<b>All other forms of heart disease</b>	1,413	13.4%	25.8

## Leading Causes of Death Worldwide

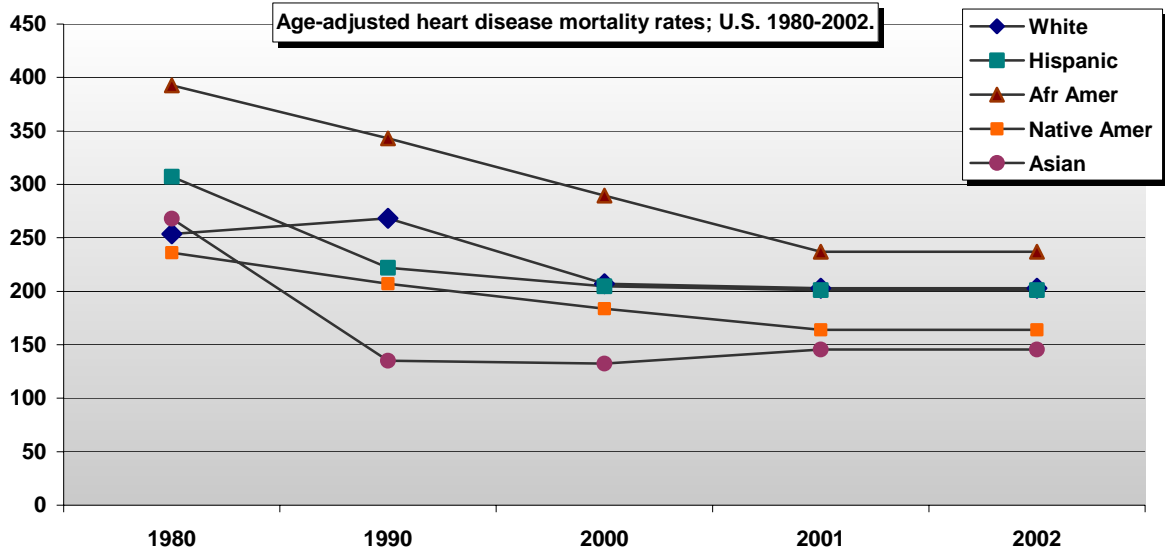
Cardiovascular disease is the foremost causes of death throughout the world and are projected to remain so throughout 2020<sup>49</sup>. Worldwide, coronary heart disease and stroke together account for an estimated 11.8 million deaths a year.

Coronary Heart Disease	7.2 Million Deaths
Cancer	6.3 Million Deaths
Cerebrovascular Disease	4.6 Million Deaths
Acute Respiratory Infections	3.9 Million Deaths
Tuberculosis	3.0 Million Deaths
COPD	2.9 Million Deaths
Diarrhea/Dysentery	2.5 Million Deaths
Malaria	2.1 Million Deaths
HIV/AIDS	1.5 Million Deaths
Hepatitis B	1.2 Million Deaths

The lifetime risk for developing CHD is very high; about 70 million Americans, almost one-fourth of the population, have some form of cardiovascular disease. Coronary heart disease is responsible for more than 6 million hospitalizations a year<sup>1</sup>, and is a leading cause of premature, permanent disability in the U.S. workforce. The economic impact of heart disease and stroke is estimated at \$394 billion in 2004, including \$242 million in health care costs and \$152 million in lost productivity from premature death and disability<sup>1</sup>.

## Trends in Cardiovascular Disease Mortality

Age-adjusted cardiovascular disease mortality rates have declined significantly, approximately 42% over the past two decades. The decline is largely attributable to improvements in detection and treatment of high blood pressure, and early identification and treatment of heart attacks.



**Age-adjusted cardiovascular disease death rates, by Race/Ethnicity, U.S., 1980-2002.**

	1980	1990	2000	2001	2002	% Change 1980-2002
<b>White</b>	253.6	268.3	207.2	202.1	203.0	24.9%
<b>Hispanic</b>	307.3	222.0	204.7	206.1	201.2	52.7%
<b>African American</b>	392.5	343.0	289.5	273.6	237.0	65.6%
<b>Native American</b>	236.1	207.1	183.8	177.7	164.0	44.0%
<b>Asian</b>	268.1	135.0	132.3	116.1	145.6	84.1%
<b>All Groups</b>	346.6	263.8	206.1	201.7	201.0	72.4%

Recent trends in age-adjusted heart disease death rates suggest that the period of steady decline in deaths may be leveling out, or at least declining at a slower rate. Further, declines in the unadjusted death rate and in the absolute number of deaths show no decline because of an increase in the number of older people in the United States, who have higher rates of CHD.

***Cardiovascular Disease: Race/Ethnicity, Gender and Age***

A common belief is that cardiovascular disease mostly affects men and older persons. But heart disease and stroke are the leading causes of death in the U.S. for women and all racial and ethnic groups. And although the number of older persons affected is great, cardiovascular disease is increasing among persons age 35 and younger, reflecting the rise in risk factors such as diabetes and obesity<sup>45</sup>. The incidence of cardiovascular disease is projected to increase further as the country's "baby boom" generation ages and the number of older Americans increases<sup>3,4</sup>.

**Diseases of the Heart: Number and Percent of Total Deaths, and Ranking, by Race/Ethnicity; US, 2001.**

Race	Rank	Number	Percent of Total Deaths
All Races	1	725,192	30.3%
Caucasian	1	607,704	30.8%
African American	1	77,713	27.6%
Native American	1	2,404	21.3%
Asian or Pacific Islander	1	9,096	27.0%
Hispanic	1	25,866	25.0%

**Diseases of the Heart: Number and Percent of Total Deaths, Age-Adjusted Death Rates Per 100,000 Population, and Ranking, by Gender, US, 2001.**

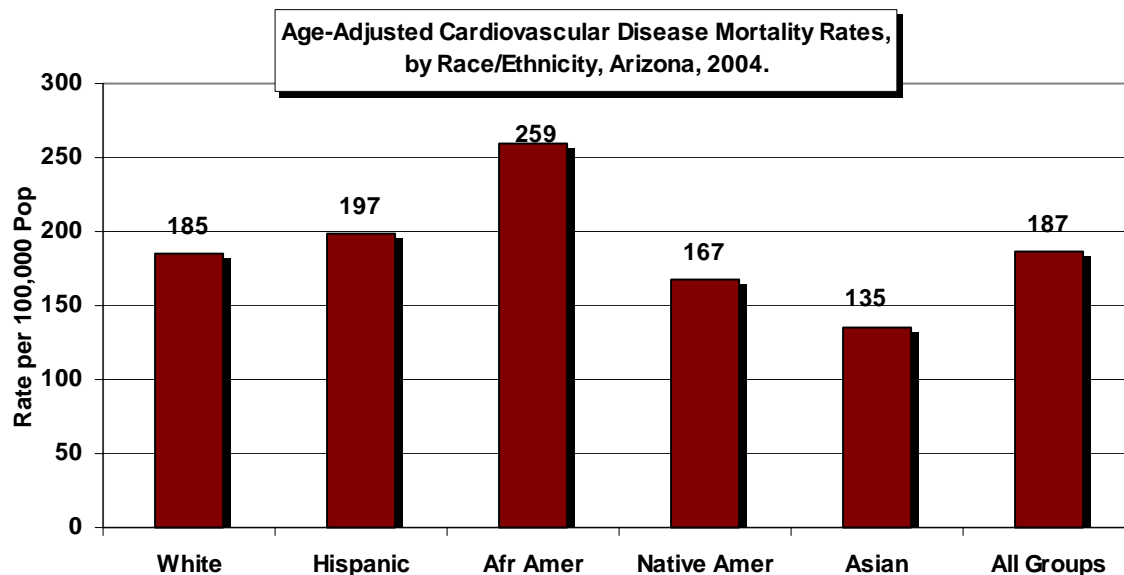
Gender	Rank	Number	Percent of Total Deaths	Death Rate
Both Sexes	1	725,192	30.3%	265.9
Male	1	351,617	29.9%	263.8
Female	1	373,575	30.7%	268.0

**Diseases of the Heart: Number and Percent of Total Deaths, Age-Adjusted Death Rates Per 100,000 Population, and Ranking, by Age, US, 2001.**

Age	Rank	Number	Percent of Total deaths	Death Rate
All Ages	1	709,894	30.0%	257.9
1-4 years	5	169	3.4%	1.1
5-14 years	6	236	3.2%	0.6
15-24 years	5	931	3.0%	2.4
25-44 years	3	15,267	11.9%	18.5
45-64 years	2	97,334	24.4%	159.2
65 years and older	1	595,440	33.0%	1712.2

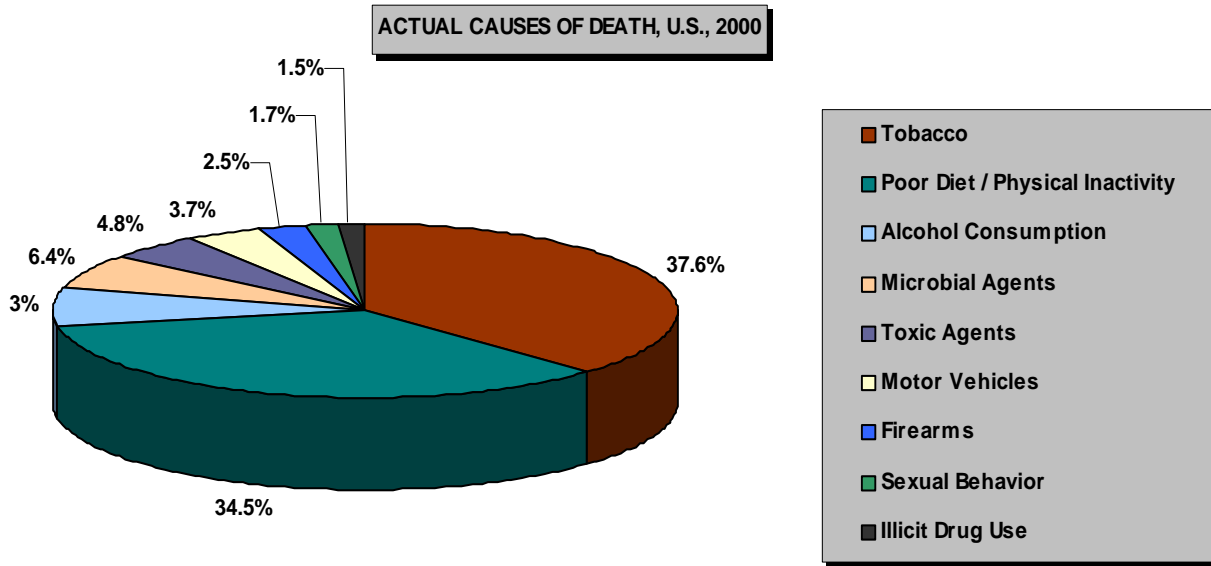
**Disparities in Cardiovascular Disease**

While the mortality rate of cardiovascular disease has declined over the years, significant disparities continue to exist for different race and ethnic groups, as seen below. Heart disease mortality is highest for African Americans, followed by Hispanics, Whites, Native Americans, and Asians. Health disparities place certain populations at greater risk, especially the poor and racial/ethnic minorities<sup>20,46,47</sup>. It should also be noted that diagnosis and treatment of women for heart disease lags significantly behind men.



### **Actual Causes of Death**

The Centers for Disease Control and Prevention (CDC) has identified lifestyle and behavioral factors that contribute to the nation's leading killers including heart disease, cancer, and stroke. These factors represent "actual causes of death."<sup>5,6</sup>



Tobacco (37.6%), poor nutrition and physical inactivity (34.5%) together account for almost three-quarters (72.1%) of all heart disease, cancer and stroke deaths. Other modifiable causes of death include alcohol, motor vehicle accidents, firearms, sexual behavior, and illicit drug use.

## **RISK FACTORS FOR CARDIOVASCULAR DISEASE**

Risk factors for heart disease and stroke have been established for many years<sup>44</sup>. Individual, modifiable risk factors, distinct from age, family history, and genetics, that increase the risk for cardiovascular diseases include hypertension, tobacco use, high blood cholesterol, physical inactivity, being overweight or obesity, diabetes, and poor nutrition. There is strong evidence, based on research conducted over the past 30 years that high blood pressure, blood cholesterol levels, and smoking habits can be modified, and that diabetes can be prevented and controlled by behavioral change and medications<sup>44</sup>. There is also evidence that reducing major risk factors for heart disease result in declines in heart disease death rates<sup>48</sup>.

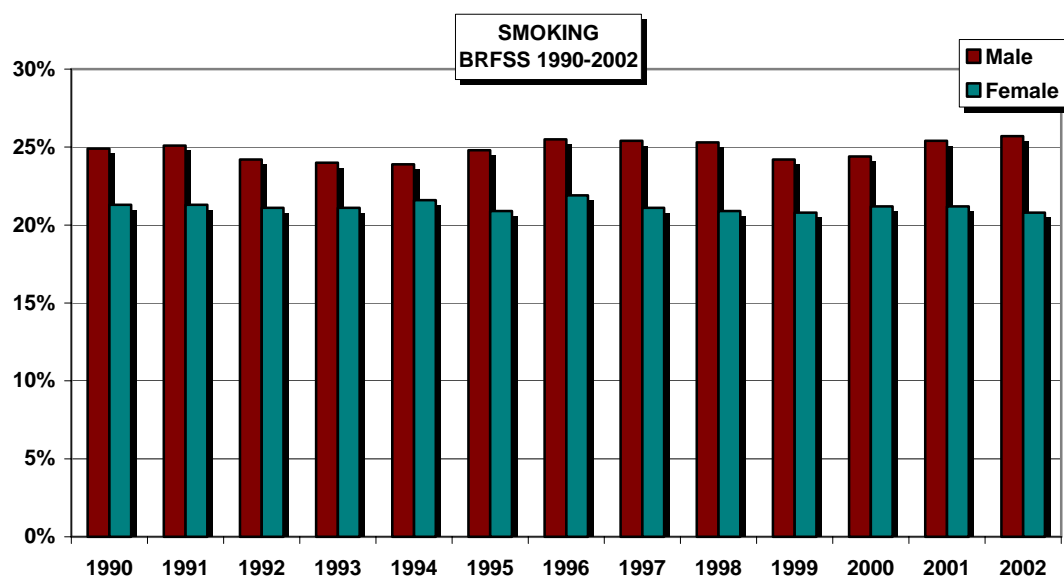
Environmental conditions contribute to behaviors that affect risk factors, such as poverty, education, cultural influences, and personal habits, compounded by policies such as tobacco control, food production and advertising.

### ***Hypertension or High Blood Pressure (HBP)***

- About 50,000,000 Americans age 6 and older have HBP, defined as systolic pressure of 140 mm Hg or higher or diastolic pressure of 90 mm Hg or higher, or taking antihypertensive medicine<sup>7</sup>.
- 1 in 5 Americans (and 1 in 4 adults) has HBP<sup>7</sup>.
- The cause of 90-95% of cases of HBP isn't known; however, HBP is easily detected and usually controllable<sup>7</sup>.
- People with lower educational and income levels tend to have higher levels of blood pressure<sup>7</sup>.
- Of those with HBP, 32% are unaware they have it; 27% are on medication but don't have their HBP under control; and 15% aren't on medication<sup>8</sup>.
- HBP is 2-3 times more common in women taking oral contraceptives, especially obese and older women, than in women not taking them<sup>8</sup>.
- About one-half of people who have a first heart attack and two thirds who have a first stroke have blood pressures higher than 160/95 mm Hg<sup>9</sup>.
- The prevalence of hypertension in African-Americans in the United States is among the highest in the world. Compared with whites, African-Americans develop HBP earlier in life and their average blood pressures are much higher. As a result, African Americans have a 30 percent greater risk of nonfatal stroke, an 80 percent greater risk of fatal stroke, a 50 percent greater risk of heart disease death and a 320 percent greater risk of end-stage renal disease<sup>8</sup>.
- According to data from Framingham Heart Study, hypertension preceded the development of congestive heart failure (CHF) in 91% of cases. Persons with HBP experienced a two-to threefold greater risk for the development of CHF<sup>10</sup>.
- HBP generally requires life long treatment. Studies have shown that as many as 50% of patients with HBP discontinue their medications within 2 years.

## Tobacco Use

- For the years 1990-94, an average of 430,700 Americans died each year of smoking related illnesses. The largest portion of these deaths was cardiovascular-related<sup>11</sup>.
- Cigarette smokers are two to four times more likely to develop coronary heart disease than nonsmokers<sup>16</sup>, and at about twice as likely to have a stroke<sup>17,18</sup>. Approximately one in five deaths from cardiovascular diseases is attributable to smoking<sup>11, 19, 20</sup>. More deaths are caused each year by tobacco use than by all deaths from HIV, illicit drug use, alcohol use, motor vehicle accidents, suicides and homicides combined<sup>5,19</sup>.
- About 37,000-40,000 nonsmokers die from cardiovascular disease each year as a result of exposure to environmental tobacco smoke<sup>11</sup>.
- Smoking costs Americans an estimated \$130 billion annually in medical care. This includes the effects of smoking during pregnancy, lost workdays, lost output from early death and retirement, and fires caused by smoking<sup>12</sup>.
- Studies show that among people age 18 and older in the U.S., smoking has declined by about 44% since 1965<sup>13</sup>. Over the past decade however, this downward trend has leveled off and remained at about the same level for both males and females<sup>14</sup>.



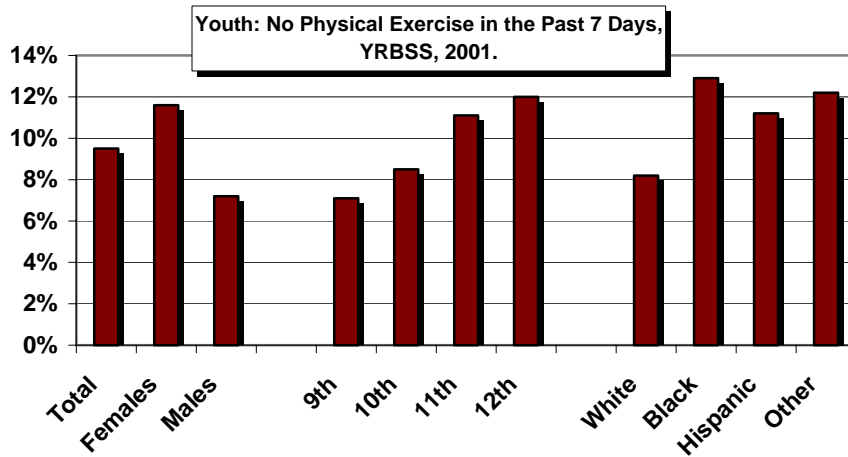
- Global mortality from tobacco use is estimated at 4 million a year, with worldwide deaths projected to rise to 10 million in 2030. Approximately 80% of current smokers live in the developing world<sup>15</sup>.
- Studies have shown that people who stop smoking decrease their cardiovascular risk back to baseline for their age and gender after 7-10 years.
- Current therapies for smoking cessation are much more effective than they have been in the past.

### **High Blood Cholesterol and other Lipids**

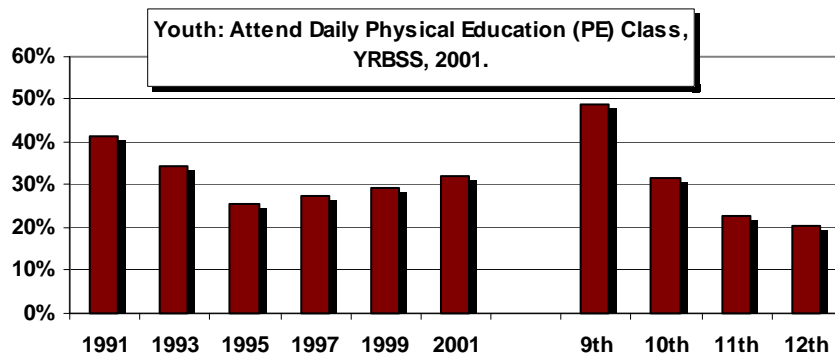
- Among Americans age 18 and older, the median percentages who have been told by a professional that they have high blood cholesterol are<sup>21</sup>:
  - Whites: 29.7%.
  - Blacks: 26.0%.
  - Hispanics: 25.6%.
  - Asian/Pacific Islanders: 27.3%.
  - American Indians/Alaska Natives: in Alaska, 26.0%; in Oklahoma, 28.6%; in Washington, 26.5%.
- Studies show that a higher percentage of women than men have total blood cholesterol of 200 mg/dL or higher, beginning at age 50<sup>21</sup>.
- A 10% decrease in total cholesterol levels may result in an estimated 30% reduction in the incidence of CHD<sup>22</sup>.
- Among children and adolescents ages 4-19 years (NHANES III [1998-94], CDC/NCHS), females have significantly higher average total cholesterol and low-density lipoprotein (LDL) cholesterol ("bad" cholesterol) than do males<sup>23</sup>.
- African-American children and adolescents have significantly higher mean total cholesterol, LDL cholesterol and high-density lipoprotein (HDL) cholesterol ("good" cholesterol) levels compared with white and Mexican-American children and adolescents<sup>23</sup>.
- About 10% of adolescents ages 12-19 have total cholesterol levels exceeding 200 mg/dL<sup>23</sup>.

### **Physical Inactivity**

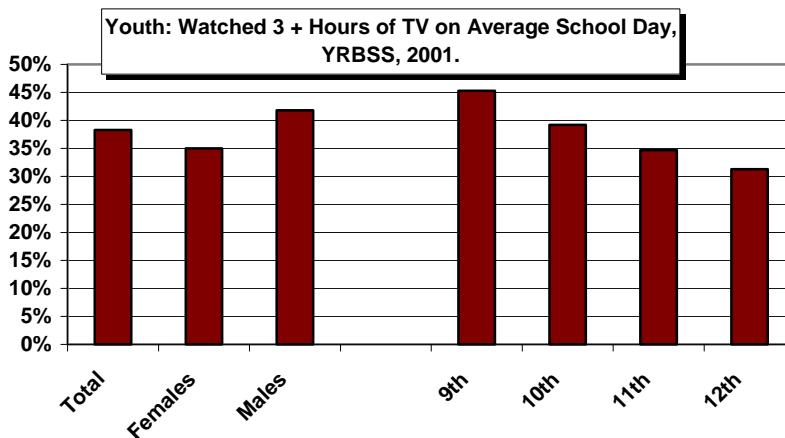
- About 29% of Americans age 18 or older reported no leisure-time physical activity (1988), only 27% achieved recommended levels of physical activity, and 44% reported some activity but below recommended levels<sup>24</sup>.
- Men, young people, whites, college-educated, and higher income had higher levels of activity compared with women, older persons, less educated, poorer, or non-white<sup>24</sup>.
- The relative risk of CHD associated with physical inactivity ranges from 1.5 to 2.4, an increase in risk comparable to that observed for high blood cholesterol, high blood pressure or cigarette smoking<sup>26</sup>.
- Less-active, less-fit persons have a 30-50% greater risk of developing high blood pressure<sup>27</sup>.
- Physical inactivity is more prevalent among women than men, among blacks and Hispanic than whites, among older than younger adults and among the less affluent and more affluent<sup>28</sup>.
- Among adults age 18 and older, the following proportions of people are sedentary (have no leisure time physical activity)<sup>29</sup>:
  - Whites: 33.3% of men and 38.9% of women.
  - African Americans: 46% of men and 57.1% of women.
  - Hispanics: 49.9% of men and 57.1% of women.
  - Asian/Pacific Islanders: 36.2% of men and 49.2% of women.
- Among youth, almost twice as many girls as boys report no physical exercise. The amount of exercise decreases with age<sup>30</sup>.



- The percent of youth who attend PE classes decreases by grade, with only 20% of 12<sup>th</sup> graders taking PE<sup>31</sup>.

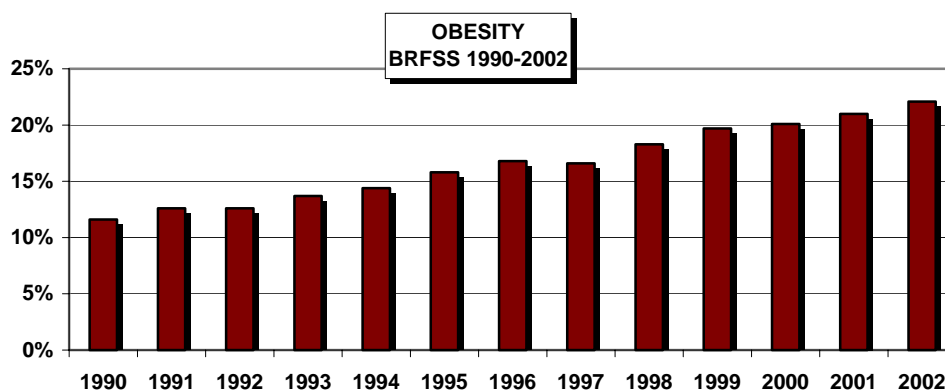


- Almost 40% of youth reportedly watch 3 or more hours of television on an average school night<sup>32</sup>.



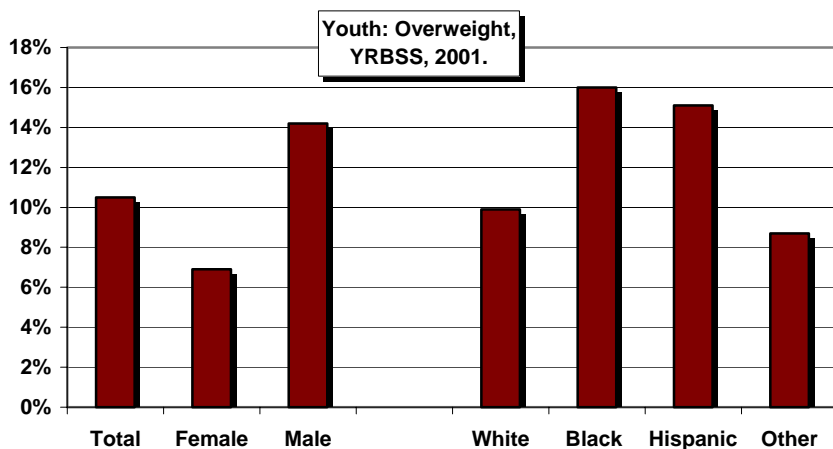
## Overweight/Obesity

- Using a body mass index (BMI) of 25.0 or higher as “overweight” and a BMI of 30.0 or higher as “obese,” 108,300,000 Americans age 20 and older are considered overweight (56,350,000 men and 51,980,000 women). Of these, 44,250,000 are considered obese (18,680,000 men and 25,570,000 women). In addition, an estimated 5,030,000 children ages 6-17 are considered overweight (based on the 95<sup>th</sup> percentile of BMI values in the 2000 CDC growth chart for the U.S.<sup>33</sup>).
- Obesity has almost doubled over the past decade. An estimated 300,000 U.S. adults a year now die of causes related to obesity<sup>34</sup>.



- Among Americans age 18 and older, the following people are overweight (defined as a BMI of 25 kg/m<sup>2</sup> or higher<sup>35</sup>):
  - Whites: 62.4% of men and 43.0% of women.
  - African Americans: 64.1% of men and 64.5% of women.
  - Hispanics: 64.7% of men and 56.8% of women.
  - Asian/Pacific Islanders, 35.2% of men and 25.2% of women.
- Among Americans age 18 and older, the median percentages of obesity are (defined as a BMI greater than 30 kg/m<sup>2</sup>)<sup>36</sup>
  - Whites: 15.6%
  - African Americans: 26.4%
  - Hispanics: 18.2%
  - Asian/Pacific Islanders: 4.8%
  - American Indians/Alaska Natives: 30.1%
- Among Americans ages 20-74 (with a BMI of 25 or higher to indicate overweight and a BMI of 30 or higher to indicate obesity), the age-adjusted prevalences are<sup>33</sup>:
  - Whites: 61.5% of men and 46.8% of women are overweight; 20.8% of men and 23.3% of women are obese.
  - African Americans: 58.4% of men and 68.3% of women are overweight; 21.3% of men and 38.2% of women are obese.
  - Mexican Americans: 69.3% of both men and women are overweight; 24.8% of men and 36.1% of women are obese.

- Between 1976-80 and 1999-2002, the prevalence of overweight children 6-11 years of age more than doubled from 7 to 16 percent, and the prevalence of overweight adolescents 12-19 years of age more than tripled from 5 to 16 percent.<sup>39</sup>



- An expert group convened by the World Health Organization in June 1997 found that being overweight or obese represents a rapidly growing threat to the health of populations in an increasing number of countries worldwide. WHO recognized obesity as a disease that is prevalent in both developing and developed countries and that affects children and adults alike<sup>37</sup>.

### **Diabetes**

- The prevalence of diabetes rose from 4.9% in 1990 to 6.5% in 1998, an increase of 33.3%. Increases were observed in both sexes, all ages, all ethnic groups, all education levels, and nearly all states<sup>38</sup>.
- The 1999 overall death rate from diabetes was 24.9 per 100,000 population. Death rates were 25.8 for white males, 48.6 for black males, 20.5 for white females and 50.4 for black females.<sup>39</sup>

Two-thirds of people with diabetes mellitus die of some form of heart or blood vessel disease<sup>40</sup>.

- The age-adjusted prevalence of physician-diagnosed diabetes in adults age 20 and older is (NHANES III [1988-94], CDC/NCHS)<sup>23</sup>:
  - For non-Hispanic whites, 5.4% of men and 4.7% of women.
  - For non-Hispanic blacks, 7.6% of men and 9.5% of women.
  - For Mexican Americans, 8.1% of men and 11.4% of women.
- Among American Indians ages 45-74, 43.5% of men and 52.4% of women have diabetes mellitus<sup>25</sup>.
- The risk of diabetes for Mexican Americans and non-Hispanic blacks is almost twice that for non-Hispanic whites<sup>41</sup>.
- An estimated 5,600,000 Americans have undiagnosed diabetes – about 3,000,000 men and 2,600,000 women<sup>41</sup>.

### **Poor Nutrition**

- Good nutrition is important for preventing heart disease and stroke. Healthy food habits help maintain normal blood pressure, desirable blood cholesterol levels, a healthy body weight, and may aid blood clotting, oxidation, maintaining a normal heart rhythm and other effects. A poor diet, on the other hand, contributes to high blood pressure, high blood cholesterol and excess body weight. Being overweight or obese contributes to diabetes, cholesterol disorders, and high blood pressure.
- The American Heart Association recommends a diet low in saturated fat, trans fat, cholesterol and sodium. A good diet should be high in vegetables, fruits, whole grains, legumes, fat-free or low-fat dairy products, and dietary fiber<sup>42</sup>.
- Between 1965 and 1991 among U.S. adults age 18 and older, total daily calories declined from 2,049 to 1,807, but then rebounded to 2,000 in 1996. This contributed to the marked increase in obesity levels in the past decade<sup>43</sup>.
- Between 1965 and 1996 among adults, total fat as a proportion of daily calorie intake fell steadily from 39.1 to 33.1 percent. Saturated fat fell from 14.4 to 11.0 percent. However, total calorie intake increased between 1991 and 1996. Over the same period daily total fat consumption rose from 70.9 grams (g) to 75.8 g<sup>43</sup>.
- Total fat intake (saturated, trans, monounsaturated, polyunsaturated) should be less than 30 percent of total daily calories. Saturated fat and trans fat should not exceed 10 percent of total daily calories for healthy people. Saturated fat should be less than 7 percent of total daily calories for people with coronary heart disease, diabetes or high LDL cholesterol<sup>42</sup>.

## NATIONAL HEALTH OBJECTIVES FOR CARDIOVASCULAR DISEASE

The U.S. Centers for Disease Control and Prevention has established health promotion and disease prevention objectives for the nation entitled *Healthy People 2000*. Healthy People 2010, building on previous initiatives begun in 1980, identifies health improvement goals and objectives to be reached by the year 2010. Objectives were developed by teams of experts under the direction of the Secretary of Health and Human Services. A total of 28 focus areas are addressed, including Heart Disease and Stroke. For more information see the Healthy People website: [www.health.gov/healthypeople/](http://www.health.gov/healthypeople/).

### Coronary Heart Disease

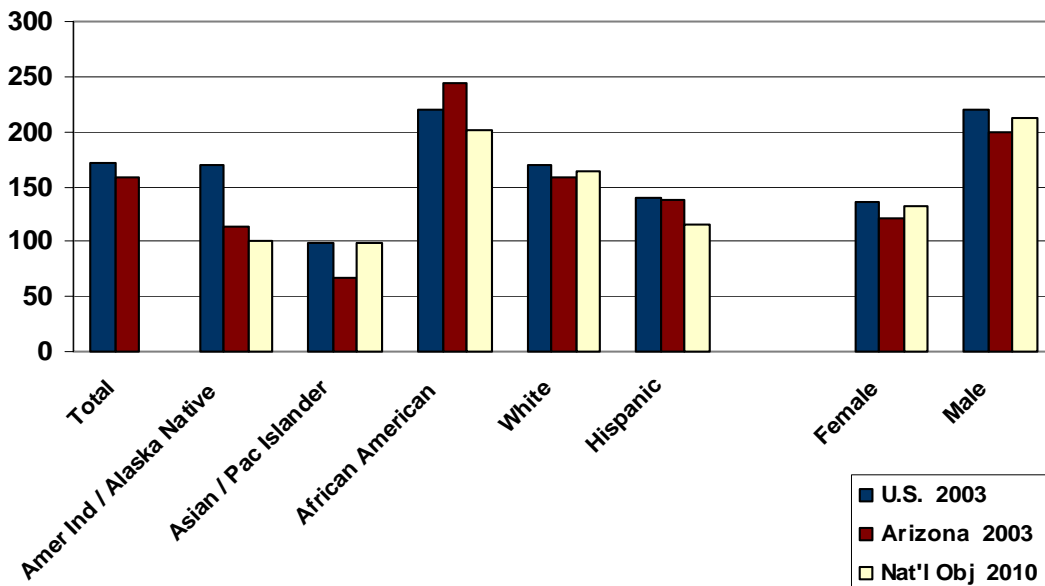
	U.S. Baseline <sup>1</sup>	U.S. 2003	Arizona 2003	Nat'l Obj 2010 <sup>2</sup>
<b>Total</b>	<b>208</b>	<b>172</b>	<b>158</b>	<b>162<sup>3</sup></b>
<b>Amer Ind / Alaska Native</b>	<b>126</b>	<b>170</b>	<b>114</b>	<b>101</b>
<b>Asian / Pac Islander</b>	<b>123</b>	<b>99</b>	<b>67</b>	<b>98</b>
<b>African American</b>	<b>252</b>	<b>220</b>	<b>245</b>	<b>202</b>
<b>White</b>	<b>206</b>	<b>170</b>	<b>158</b>	<b>165</b>
<b>Hispanic</b>	<b>145</b>	<b>139</b>	<b>138</b>	<b>116</b>
<b>Female</b>	<b>165</b>	<b>136</b>	<b>122</b>	<b>132</b>
<b>Male</b>	<b>265</b>	<b>220</b>	<b>200</b>	<b>212</b>

<sup>1</sup> 1999

<sup>2</sup> Target setting method: 20% reduction

<sup>3</sup> Revised

Coronary Heart Disease: Distribution by Race and Gender  
U.S. , Arizona, 2003; National Objectives 2010



**Stroke**

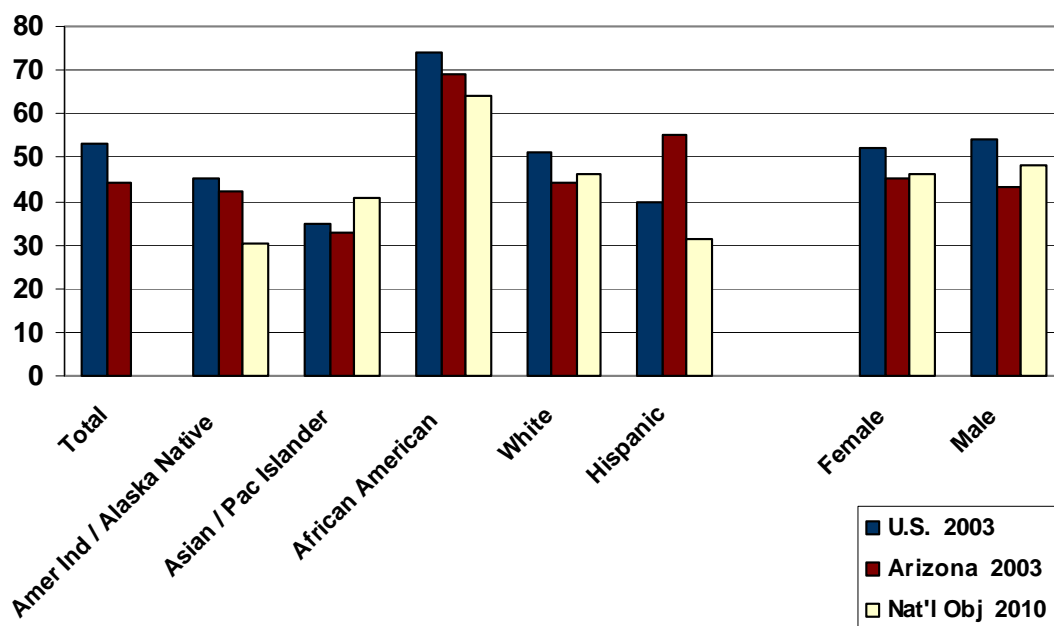
	U.S. Baseline <sup>1</sup>	U.S. 2003	Arizona 2003	Nat'l Obj 2010 <sup>2</sup>
Total	60	53	44	50 <sup>3</sup>
Amer Ind / Alaska Native	38	45	42	30
Asian / Pac Islander	51	35	33	41
African American	80	74	69	64
White	58	51	44	46
Hispanic	39	40	55	31
Female	58	52	45	46
Male	60	54	43	48

<sup>1</sup> 1999

<sup>2</sup> Target setting method: 20% reduction

<sup>3</sup> Revised

**Stroke: Distribution by Race and Gender**  
U.S. , Arizona, 2003; National Objectives 2010



## **II. CARDIOVASCULAR DISEASE PREVENTION: RECOMMENDED ACTIONS**

Early interventions to reduce risks and promote heart-healthy behaviors have the potential to significantly reduce morbidity and mortality from cardiovascular disease. Yet only pennies a person are spent on prevention of risk factors, while thousands of dollars per person are expended treating established cardiovascular disease risk factors and illness, restoring function, and providing end-of-life care<sup>44</sup>. A greater impact on cardiovascular health would be realized if increased resources were dedicated to prevention, education and early intervention.

The Foundation for Cardiovascular Health supports the following actions aimed towards health promotion, prevention and early detection of cardiovascular disease risk factors. Implementation of these recommended actions has the potential to reduce the incidence of cardiovascular disease risk factors and avoid unnecessary illness and the suffering it causes.

### ***SCHOOL-BASED HEALTH EDUCATION***

- Comprehensive, age-appropriate, culturally-sensitive, school-based kindergarten through grade 12 health education should be available in all schools.
- Behavioral health education that addresses risk factors for cardiovascular disease should be included as part of a comprehensive health education curriculum in all schools. Behavioral health education should include:
  - Tobacco use prevention and cessation.
  - Nutrition education, healthy dietary practices, reduction of high-fat, low-fiber diets, and healthy eating habits.
  - Promotion and support of exercise and physical activity.
  - Weight control, prevention and reduction of overweight and obesity.
  - High blood pressure and cholesterol prevention and control.
- Schools should offer meals and snacks that contribute to healthy overall dietary quality.

### ***COMMUNITY-BASED HEALTH PROMOTION/DISEASE PREVENTION***

- Community-based health promotion/disease prevention programs should be developed and implemented, that are culturally and linguistically appropriate, using a variety of multi-media approaches (television, radio, newspapers, telephone help lines, local agencies, organizations and community leaders, etc), targeting high risk populations and behaviors that contribute to cardiovascular disease.
- Community-based health promotion/disease prevention programs should be established focusing on risk reduction and modification of cardiovascular disease risk factors, avoidance of unhealthy behaviors, screening, early detection and referral for problems, including:
  - Tobacco control programs, including tobacco use prevention, cessation, and policies that restrict tobacco use.
  - Nutrition education, reduction of high-fat, low-fiber diets, and healthy eating habits.
  - Programs that promote and support exercise and physical activity.
  - Weight control, prevention and reduction of overweight and obesity.
  - Hypertension prevention and control.
  - Cholesterol control.
  - Physical activity.
  - Healthy nutrition.

- Community cardiopulmonary resuscitation (CPR) education programs should be made available for the public free-of-charge in a variety of settings.
- Community education programs should be implemented regarding awareness of the early warning signs and symptoms of a heart attack and stroke, and the importance of accessing rapid emergency care by calling 911.

### ***TOBACCO CONTROL***

- All residents of the state should have access to toll-free tobacco quitline services, regardless of geographic location or economic status.
- Tobacco control programs should be available in schools, workplaces and communities focusing on education and prevention of tobacco use.
- Access to evidence-based tobacco treatment programs should be available and accessible for all persons regardless of economic status and ability to pay.
- Over-the-counter sale of cigarettes to minors, and cigarette advertising that glamorizes tobacco use should be prohibited and laws enforced.
- Insurance coverage should be expanded to include evidence-based treatment for nicotine dependency.
- Policies should be enacted and enforced that address tobacco-free environments in schools, including all school facilities, property, vehicles, and school events.
- Programs should be established that encourage and assist people to lead tobacco-free lives.

### ***IMPROVED NUTRITION***

- Healthy food choices should be made available in restaurants, schools, child care facilities, and other institutions, consistent with Dietary Guidelines for Americans.
- Improved access to nutritional information and education is needed, and healthful foods should be provided in a variety of settings for all population groups.

### ***PHYSICAL ACTIVITY AND EXERCISE***

- Physical education should be provided and required in all schools and all grades, and the number of children and adolescents who participate in daily school physical education should be increased.
- Community physical activity and recreational facilities should be expanded to promote physical and psychological health.

## **WORKSITES**

- Employee health promotion programs should be made available by major businesses, and include early detection, screening and referral for cardiovascular disease risk factors, tobacco counseling and treatment services, nutrition and weight management, and physical activity and fitness programs.
- Formal smoking prohibition policies should be enacted that prohibit smoking at the workplace or limit it to separately ventilated areas.

## **HEALTH AND MEDICAL CARE**

- Early diagnosis, treatment, and appropriate referral for persons with high blood pressure and high cholesterol levels are needed to help control these conditions and prevent the development of cardiovascular disease.
- Physician visits made by patients with a diagnosis of cardiovascular disease, or with cardiovascular disease risk factors, should include counseling and education related to tobacco use treatment, diet and nutrition, and physical activity. Health Insurance should pay for these preventive visits.
- Identification and elimination of barriers to care for risk reduction and treatment of cardiovascular disease are needed, including financial, administrative, knowledge and informational problems, transportation, language, culture, and other barriers that inhibit or obstruct adoption of healthy behaviors and receipt of quality medical care.
- Increased availability of cardiovascular reversal programs and cardiac rehabilitation services for persons diagnosed with heart disease.
- Community health promotion and disease prevention activities should be implemented by hospitals and health care organizations.
- All persons who experience out-of-hospital cardiac arrest should receive their first therapeutic electrical shock within 6 minutes after calling 911.
- All persons who experience heart attacks should receive artery-opening therapy within an hour of symptom onset regardless of ability to pay.
- Increased availability of defibrillators in public places and increased training in their use.

## APPENDICES

### References

1. Centers for Disease Control and Prevention, National Center for Health Statistics (CDC/NCHS), faststats. [www.cdc.gov/nchs/fastats/deaths.htm](http://www.cdc.gov/nchs/fastats/deaths.htm). Accessed February 21, 2006.
2. Murray CJL, Lopez A. *Alternative Projections of Mortality and Disability by Cause 1990-2020: Global Burden of Disease Study*. *Lancet* 1997;349: 1408-1504.
3. Foot DK, Lewis RP, Pearson TA, Beller GA. *Demographics and Cardiology, 1950-2050*. *Journal of the American College of Cardiology* 2000;35 (No.5, Suppl B): 66B-80B.
4. Howard G, Howard VJ. *Stroke Incidence, Mortality, and Prevalence*. In: Gorelick PB, Alter M, editors. *The Prevention of Stroke*. New York, NY: The Parthenon Publishing Group; 2002:1-10.
5. McGinnis JM, Foeg WH. *Actual causes of death in the United States*. *JAMA* 1993;270:2207-12.
6. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. *Actual causes of death in the United States, 2000*. *JAMA* 2004;291-1238-1245.
7. *National Health And Nutrition Examination Survey (NHANES) III, 1988-91*, Centers for Disease Control, National Center for Health Statistics (CDC/NCHS).
8. *Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure, JNC VI, 1991-94*.
9. National Heart, Lung, and Blood Institute (HLBI), 1988, *Report of the Task Force on Behavioral Research in Cardiovascular, Lung and Blood Healthy Disease*. Bethesda, MD, NIH; 02/98.
10. *The Framingham Heart Study*. *Journal of the American Medical Association*. 1996;275;1557-1562.
11. *Perspectives in Disease Prevention and Health Promotion: Smoking and Cardiovascular Disease*. *MMWR* Jan 6, 1984, 32(52);677-9.
12. *The Economic Costs of Smoking in the U.S. and Benefits of Comprehensive Tobacco Legislation*. U.S. Treasury Dept.; March 1998.
13. *Surveillance for Selected Tobacco-Use Behaviors – United States, 1900-1994*. *MMWR*, Nov 18, 1994 Vol 43 No. SS-3.
14. *Prevalence of Current Cigarette Smoking Among Adults and Changes in Prevalence of Current and Some Day Smoking – United States, 1996-2001*. *MMWR* April 11, 2003 / 52(14):303-307.
15. *Tobacco: Global Effects of Tobacco Use*. [globalhealth.gov](http://globalhealth.gov), U.S. Department of Health and Human Services. [www.globalhealth.gov/tobacco](http://www.globalhealth.gov/tobacco). Accessed Feb 17, 2006.
16. *Reducing the Health Consequences of Smoking – 25 Years of Progress: A Report of the Surgeon General*. U.S. Department of health and Human Services. Atlanta, GA; CDC; 1989. DHHS Pub. No. (CDC) 89-8411.
17. Novotney TE, Giovino GA, Tobacco use. In Brownson RC, Remington PL, Davis JR eds). *Chronic Disease Epidemiology and Control*. Washington, DC; American Public Health Association; 1998, p. 117-148.

18. Ockene IS, Miller NH. *Cigarette smoking, cardiovascular disease, and stroke: a statement for healthcare professionals from the American Heart Association*. Journal of the American Health Association 1997; 96(9): 3243-3247.
19. Centers for Disease Control and Prevention. *Annual smoking-attributable mortality, years of potential life lost, and economic costs – United States, 1995-1999*. MMWR 2002; 51(14):300-303.
20. Centers for Disease Control and Prevention. *Health United States, 2003, With Chartbook on Trends in the Health of Americans*. Hyattsville, MD; CDC, National Center for Health Statistics; 2003.
21. Centers for Disease Control and Prevention. *Behavioral Risk Factor Surveillance Survey (BRFSS) [1997]*, MMWR, Vol. 49, No. SS-2, March 24, 2000, CDC/NCHS).
22. Centers for Disease Control and Prevention. MMWR, Vol. 49, No. 33, Aug. 25, 2000, CDC/NCHS.
23. Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS). *National Health and Nutrition Examination Survey (NHANES) III [1998-94]*.
24. Centers for Disease Control and Prevention. National Center for Health Statistics, 2000. *Behavioral Risk Factor Surveillance Survey (BRFSS)*. [1999].
25. Strong Heart Study [1989-92]. 6701 Rockledge Dr. MSC, Bethesda MD 20892. National Heart, Lung, and Blood Institute. National Institutes of Health, DHHS.
26. Journal of the American Medical Association. 1995; 273; 402-407.
27. Cardiovascular benefits and assessment of physical activity and physical fitness in adults. Med Sci Sports Exerc. 1992;24 (supplement):S201-S220.
28. *Physical activity and Health*, U.S. Surgeon General's Report, 1996.
29. Centers for Disease Control and Prevention. National Center for Health Statistics, *National Health Interview Survey (NHIS [1997]*, CDC/NCHS.
30. Centers for Disease Control and Prevention. National Center for Health Statistics, 2000. *Youth Risk Behavior Surveillance Survey [2001]*.
31. Centers for Disease Control and Prevention. National Center for Health Statistics, 2000. *Youth Risk Behavior Surveillance Survey [2001]*.
32. Centers for Disease Control and Prevention. National Center for Health Statistics, 2000. *Youth Risk Behavior Surveillance Survey [2001]*.
33. Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS). *National Health and Nutrition Examination Survey (NHANES) III [1998-94]*.
34. Centers for Disease Control and Prevention. National Center for Health Statistics, 2000. *Behavioral Risk Factor Surveillance Survey (BRFSS)*. CDC/NCHS, JAMA. 1999;282:1530-1538.
35. Centers for Disease Control and Prevention. National Center for Health Statistics, National Health Interview Survey (NHIS [1997], CDC/NCHS.
36. Centers for Disease Control and Prevention. *Behavioral Risk Factor Surveillance Survey (BRFSS) [1997]*, MMWR, Vol. 49, No. SS-2, March 24, 2000, CDC/NCHS.

37. Obesity: preventing and managing the global epidemic. Geneva, World Health Organization (WHO Technical Report Series No. 894).  
[www.wpro.who.int/health\\_topics/obesity/](http://www.wpro.who.int/health_topics/obesity/) Accessed Feb 17, 2006.
38. Centers for Disease Control and Prevention. National Center for Health Statistics, 2000. *Behavioral Risk Factor Surveillance Survey (BRFSS)*. *Diabetes Care*. 2000;23:1278-1283)
39. Centers for Disease Control and Prevention. *Health United States, 2005 With Chartbook on Trends in the Health of Americans*. Hyattsville, MD; CDC, National Center for Health Statistics; 2005
40. Be Smart About Your Heart. Control the ABCs of Diabetes. A1C, Blood Pressure, Cholesterol. American Diabetes Association. 1701 North Beauregard Street, Alexandria, VA 22311.
41. Centers of Disease Control and Prevention. *Diabetes Care*. 1998;21:518-524). National Center for Health Statistics.
42. American Heart Association. *Dietary Guidelines for Healthy Americans*.  
<http://americanheart.org/presenter.jhtml?identifier=1330>. Accessed Feb 17, 2006.
43. Centers for Disease Control and Prevention, National Center for Health Statistics. *Healthy People Review 2000*. DHHS Pub. No. (PHS) 99-1256. Hyattsville, MD: Public Health Service (PHS).
44. *A Public Health Action Plan to Prevent Heart Attack and Stroke*. U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. CDC; Atlanta, GA; 2003.
45. Cooper R, Cutler J, Desivgne-Dickens P, et al. *Trends and Disparities in Coronary Heart Disease, Stroke, and Other Cardiovascular Disease Prevention*. *Circulation* 2000; 102:3137-47.
46. Casper ML, Barnet E, Williams GI Jr. et al. *Atlas of Stroke Mortality: Racial, Ethnic and Geographic Disparities in the United States*. Atlnd GA, US. Department of Health and Human Services, Centers for Disease Control and Prevention, January 2003.
47. Casper ML, Barnet E, Halverson JA. et al. *Women and Heart Disease: An Atlas of Stroke Mortality: Racial and Ethnic and Disparities in Mortality, Second Edition*. Morgantown WV: Office for Social Environment and Health Research, 2000.
48. Puska P; Tuomilchto J, Nissinen A, Vartiainen E, Editors. *The North Karelia Project: 20 Year Results and Experiences*. Finland, National Public Health Institute (KTI), 1995.
49. Murrey CJL, Lopez A. *Alternative Projections of Mortality and Disability by Cause 1990-2020. Global Burden of Disease Study*, *Lancet* 1997;349: 1498-1504.

## ARIZONA DEPARTMENT OF HEALTH SERVICES

### ARIZONA CARDIOVASCULAR DISEASE STATE PLAN: OBJECTIVES

#### Cardiovascular Disease State Plan Long Term Objectives:

1. Reduce the number of coronary deaths in Arizona by 25 percent, by the year 2010, in conjunction with the American Heart Association's impact goal and achieving the Healthy People 2010 goal at the same time.
2. Reduce the number of stroke deaths in Arizona by 20 percent by the year 2010.
3. Decrease the number of Arizonans diagnosed with Cardiovascular Disease by 20 percent by the year 2020.
4. Increase the proportion of adults aged 20 years and older that are aware of the early warning signs and symptoms of a heart attack and the importance of seeking immediate medical attention.
5. Increase the proportion of adults who are aware of the early warning signs and symptoms of a stroke and the importance of seeking immediate medical attention.
6. Establish a surveillance system to accurately identify the true burden of Cardiovascular Disease in the state of Arizona.
7. Establish a core team, comprised of physicians, hospital groups, public health professionals and community members, that will advise the Arizona Department of Health Services Cardiovascular Risk Reduction Program on the activities necessary to meet the long-term state plan objectives.

#### Cardiovascular Disease State Plan Primary Prevention Objectives:

1. Support existing efforts to improve related risk factors for cardiovascular disease.
  - a. Physical Activity Efforts:
    - i. Promoting Lifetime Activity in Youths
    - ii. Walk Everyday, Live Longer Arizona (W.E.L.L. AZ)
    - iii. Active Arizona
  - b. Obesity Prevention:
    - i. To promote and enable the citizens of Arizona to eat smart.
    - ii. To promote and enable active lifestyles in Arizona residents.
  - c. Smoking Cessation:
    - i. Arizona Smoker's Helpline
    - ii. Media Campaigns:
      1. Ashes to Ashes
      2. Inhale Life
    - iii. Community and School Activities
  - d. Improved Nutrition:
    - i. 5-A-Day
    - ii. Arizona Nutrition Network
2. Implement primary interventions that are specific to reducing the death and disability from cardiovascular disease.
  - a. Increase the number of Arizonans that know their cholesterol values.
  - b. Increase the number of physicians that are following the recommended guidelines for cholesterol screening and treatment.
  - c. Increase the number of Arizonans that know their blood pressure value.

- d. Increase the number of physicians that are following the recommended guidelines for blood pressure screening and treatment.
  - e. Increase the number being referred to the appropriate professionals to receive medical nutrition therapy and a formal exercise prescription to treat high cholesterol and high blood pressure.
  - f. Follow the Barbershop Hypertension Screening Program as a model for identifying hypertension in African Americans and other groups as a way to reduce disparities in the screening process.
3. Implement primary interventions that are specific to those who are at increased risk of developing cardiovascular disease due to other complicating diseases.

**Cardiovascular Disease State Plan Secondary Prevention Objectives:**

1. Individual Interventions:
  - a. Increase the number of those diagnosed with heart disease and stroke that participate in cardiac rehabilitation and other formal, multidisciplinary approaches to secondary prevention of the heart disease and stroke.
  - b. Increase the number of those diagnosed with heart disease and stroke that adhere to their prescribed medications.
  - c. Increase the number of Arizonans diagnosed with hypertension who adhere to their medications, medical nutrition therapy and formal exercise program.
  - d. Increase the number of Arizonans diagnosed with hyperlipidemia / dyslipidemia who adhere to their medications, medical nutrition therapy and formal exercise prescription.
2. Community Interventions:
  - a. Increase the availability of automated external defibrillators (AED) in public places where Emergency Medical Service availability may be delayed.
  - b. Increase the number of sites willing to participate in the American Heart Association Public Access to Defibrillators Program.
  - c. Increase the number of communities offering heart healthy activities and programs.
3. Education Interventions:
  - a. Increase the number of Emergency Medical Technician training programs in the state of Arizona that include a stroke training module in their curriculum.
4. Healthcare:
  - a. Hospitals/Healthcare Facilities:
    - i. Ensure that an adequate number of Primary Stroke Centers in Arizona meet the nationally recognized guidelines.
      1. Have at least one Primary Stroke Center within two hours of any location in the state.
      2. Promote telemedicine and transportation agreements between rural healthcare agencies and Primary Stroke Centers in Arizona.
    - ii. Increase the number of hospitals participating in the American Heart Associations program "Get With The Guidelines" CAD, Stroke and CHF programs.
  - b. Healthcare Providers:
    - i. Increase the number of healthcare providers who are appropriately utilizing evidence-based secondary prevention guidelines for heart disease and stroke.
    - ii. Increase the number of healthcare providers who are appropriately utilizing resources for lifestyle interventions including medical nutrition therapy (MNT) and allied health professionals such as registered dietitians and exercise specialists.
    - iii. Increase the number of healthcare providers who refer Arizonans to congestive heart failure multidisciplinary treatment programs.
    - iv. Increase the number of healthcare providers who refer Arizonans to multidisciplinary cardiac rehabilitation programs.

- v. Increase the number of healthcare providers who refer Arizonans to multidisciplinary diabetes treatment programs and who screen diabetics for cardiovascular disease and refer them to the appropriate professional.
- vi. Have cultural competence training available for providers as needed.
- c. First Responders
  - i. Increase the number of first responders with access to defibrillation capabilities in rural locations.
  - ii. Implement protocols under which paramedic/EMT units may bypass a hospital in order to transport a stroke victim to a Primary Stroke Center, thereby increasing their chance of survival and with less severe disabilities.

5. Worksite:

- a. Increase employers' awareness of heart disease and stroke risk factors and the impact that heart disease and stroke have on their workforce.
- b. Increase awareness that wellness efforts, especially those aimed at reducing heart disease and stroke, can reduce health care insurance claims and associated costs.
  - i. Establish a baseline level of cardiovascular disease-related costs.
  - ii. Provide wellness programs for employers and strategies to create a healthier work environment for their employees.
  - iii. Increase the number of employers that offer healthier food selections in vending machines and cafeterias.
  - iv. Increase the number of employers that offer screening programs for their employees and providing referrals to appropriate care.
  - v. Increase the number of employers that allow employees to engage in physical activity during the workday.
  - vi. Increase the number of employers who provide incentives to employees for engaging in healthy behaviors, especially those that would reduce sedentary lifestyles, tobacco usages, hypertension, high cholesterol and/or obesity rates.
  - vii. Increase awareness of community programs that would assist employers, especially small employers, in providing employee wellness benefits/programs.

6. Policy/Environmental:

- a. Pursue funding sources, both at the federal and state level to establish and provide ongoing support for a heart disease and stroke program in Arizona.
- b. Increase support and awareness of the Stop Stroke Act.
- c. Pursue the possibility of making cardiac rehabilitation available to those diagnosed with any form of cardiovascular disease and not waiting until they have suffered an attack.
- d. Work in conjunction with other programs to support issues such as:
  - i. Smoke-free environments
  - ii. Physical Education in schools.
  - iii. Healthier food choices available in schools.

7. Social Marketing Campaigns:

- a. Increase the number of people who are aware of and can recognize the signs and symptoms of a stroke and know the next step that needs to be taken.
  - i. Utilize existing stroke education materials provided by the American Heart Association.
- b. Increase the number of people who are aware of and can recognize the signs and symptoms of a heart attack or myocardial infarction (MI).
- c. Increase the number of women who are aware of the symptoms of a heart attack, which are very different than the signs of a heart attack for men.
- d. Increase the number of people who are aware of the signs and symptoms of sudden cardiac arrest.
- e. Increase the number of Arizonans that utilize the American Heart Association's Halle Heart Center as a resource to provide prevention education programs to adults as well as children.
- f. Ensure that messages are culturally appropriate to the populations being targeted.

- g. Provide materials such as videos and brochures in physician's offices to make patients aware of cardiovascular disease and its effects.

**Cardiovascular Disease State Plan Health Disparities Objectives:**

1. Provide health related information that will reduce the incidence of heart disease and stroke in culturally sensitive and relevant modalities, which will reduce disparities in individual access and ability to use the current health systems.
  - a. Utilize the resources of the American Heart Association's Cultural Health Initiatives department as well as the American Heart Association's culturally appropriate literature in relevant populations where disparities exist.

**Cardiovascular Disease State Plan Surveillance Objectives:**

1. Continue to utilize the Behavioral Risk Factor Surveillance Survey, including the new modules.
2. Continue to utilize the data that can be obtained via existing data sources such as mortality data, hospital discharge data, and emergency room data.
3. Encourage managed care organizations to develop new data systems that more accurately capture the prevalence and management of heart disease and stroke in Arizona.
4. Utilize and support the American Heart Associations Get With the Guidelines modules for coronary artery disease, stroke, and congestive heart failure as a surveillance tool as well as an intervention tool.

**CENTERS FOR DISEASE CONTROL AND PREVENTION**

**HEALTHY PEOPLE 2010 OBJECTIVES:  
HEART DISEASE AND STROKE**

**12-1. Reduce coronary heart disease deaths.**

**Target:** 166 deaths per 100,000 population.

**Baseline:** 208 coronary heart disease deaths per 100,000 population in 1998 (age adjusted to the year 2000 standard population).

**Target setting method:** 20 percent improvement.

**Data source:** National Vital Statistics System (NVSS), CDC, NCHS.

<b>Total Population, 1998</b>	<b>Coronary Heart Disease Deaths</b>
	Rate per 100,000
<i>TOTAL</i>	208
<b>Race and ethnicity</b>	
American Indian or Alaska Native	126
Asian or Pacific Islander	123
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	252
White	206
Hispanic or Latino	145
Not Hispanic or Latino	211
Black or African American	257
White	208
<b>Gender</b>	
Female	165
Male	265
<b>Education level (aged 25 to 64 years)</b>	
Less than high school	96
High school graduate	80
At least some college	38
<b>Disability status</b>	
Persons with disabilities	DNC
Persons without disabilities	DNC

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Note: Age adjusted to the year 2000 standard population.

**12-2. (Developmental) Increase the proportion of adults aged 20 years and older who are aware of the early warning symptoms and signs of a heart attack and the importance of accessing rapid emergency care by calling 911.**

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

**12-3. (Developmental) Increase the proportion of eligible patients with heart attacks who receive artery-opening therapy within an hour of symptom onset.**

**Potential data source:** National Registry of Myocardial Infarction, National Acute Myocardial Infarction Project, HCFA.

**12-4. (Developmental) Increase the proportion of adults aged 20 years and older who call 911 and administer cardiopulmonary resuscitation (CPR) when they witness an out-of-hospital cardiac arrest.**

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

**12-5. (Developmental) Increase the proportion of eligible persons with witnessed out-of-hospital cardiac arrest who receive their first therapeutic electrical shock within 6 minutes after collapse recognition.**

**Potential data source:** Medical Expenditure Panel Survey (MEPS), AHRQ.

**12-6. Reduce hospitalizations of older adults with congestive heart failure as the principal diagnosis.**

**Target and baseline:**

Objective	Reduction in Hospitalizations of Older Adults With Congestive Heart Failure as the Principal Diagnosis	1997 Baseline	2010 Target
		<b>Per 1,000 Population</b>	
<b>12-6a.</b>	Adults aged 65 to 74 years	13.2	6.5
<b>12-6b.</b>	Adults aged 75 to 84 years	26.7	13.5
<b>12-6c.</b>	Adults aged 85 years and older	52.7	26.5

**Target setting method:** Better than the best.

Data source: National Hospital Discharge Survey (NHDS), CDC, NCHS.

Adults With Congestive Heart Failure as Principal Diagnosis, 1997	Heart Failure Hospitalizations		
	Aged 65 to 74 Years	Aged 75 to 84 Years	Aged 85 Years and Older
	Rate per 1,000		
<b>TOTAL</b>	13.2	26.7	52.7
<b>Race and ethnicity</b>			
American Indian or Alaska Native	DSU	DSU	DSU
Asian or Pacific Islander	DSU	DSU	DSU
Asian	DNC	DNC	DNC
Native Hawaiian and other Pacific Islander	DNC	DNC	DNC
Black or African American	20.0	21.4	47.0
White	9.9	21.4	41.8
<b>Hispanic or Latino</b>			
Hispanic or Latino	DSU	DSU	DSU
Not Hispanic or Latino	DSU	DSU	DSU
<b>Black or African American</b>			
Black or African American	DSU	DSU	DSU
White	DSU	DSU	DSU
<b>Gender</b>			
Female	11.5	25.0	50.2
Male	15.3	29.2	58.8
<b>Education level</b>			
Less than high school	DNC	DNC	DNC
High school graduate	DNC	DNC	DNC
At least some college	DNC	DNC	DNC
<b>Disability status</b>			
People with disabilities	DNC	DNC	DNC
People without disabilities	DNC	DNC	DNC

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Stroke

**12-7. Reduce stroke deaths.**

**Target:** 48 deaths per 100,000 population.

**Baseline:** 60 deaths from stroke per 100,000 population occurred in 1998 (age adjusted to the year 2000 standard population).

**Target setting method:** 20 percent improvement.

**Data source:** National Vital Statistics System (NVSS), CDC, NCHS.

Total Population, 1998	Stroke Deaths
	Rate per 100,000
<b>TOTAL</b>	60
<b>Race and ethnicity</b>	
American Indian or Alaska Native	38
Asian or Pacific Islander	51
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	80
White	58
Hispanic or Latino	39
Not Hispanic or Latino	60
Black or African American	82
White	58
<b>Gender</b>	
Female	58
Male	60
<b>Education level (aged 25 to 64 years)</b>	
Less than high school	22
High school graduate	17
At least some college	8
<b>Disability status</b>	
Persons with disabilities	DNC
Persons without disabilities	DNC

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.  
 Note: Age adjusted to the year 2000 standard population.

**12-8. (Developmental) Increase the proportion of adults who are aware of the early warning symptoms and signs of a stroke.**

**Potential data source:** National Health Interview Survey (NHIS), CDC, NCHS.

*Blood Pressure*

**12-9. Reduce the proportion of adults with high blood pressure.**

**Target:** 16 percent.

**Baseline:** 28 percent of adults aged 20 years and older had high blood pressure in 1988–94 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

Adults Aged 20 Years and Older, 1988–94 (unless noted)	High Blood Pressure
	Percent
<b>TOTAL</b>	28
<b>Race and ethnicity</b>	
American Indian or Alaska Native	DSU
Asian or Pacific Islander	DSU
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	40
White	27
<b>Hispanic or Latino</b>	
Hispanic or Latino	DSU
Mexican American	29
Not Hispanic or Latino	28
Black or African American	40
White	27
<b>Gender</b>	
Female	26
Male	30
<b>Family income level</b>	
Poor	32
Near poor	30
Middle/high income	27
<b>Disability status</b>	
Persons with disabilities	32 (1991–94)

Adults Aged 20 Years and Older, 1988–94 (unless noted)	High Blood Pressure
	Percent
Persons without disabilities	27 (1991–94)
<b>Select populations</b>	
Persons with diabetes	DNA
Persons without diabetes	DNA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Note: Age adjusted to the year 2000 standard population.

**12-10. Increase the proportion of adults with high blood pressure whose blood pressure is under control.**

**Target:** 50 percent.

**Baseline:** 18 percent of adults aged 18 years and older with high blood pressure had it under control in 1988–94 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

Adults Aged 18 Years and Older With High Blood Pressure, 1988–94 (unless noted)	Blood Pressure Controlled
	Percent
<b>TOTAL</b>	18
<b>Race and ethnicity</b>	
American Indian or Alaska Native	DSU
Asian or Pacific Islander	DSU
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	19
White	18
<b>Hispanic or Latino</b>	
Hispanic or Latino	DSU
Mexican American	13
Not Hispanic or Latino	DNA
Black or African American	19
White	18
<b>Gender</b>	
Female	28
Male	13
<b>Family income level</b>	

Adults Aged 18 Years and Older With High Blood Pressure, 1988–94 (unless noted)	Blood Pressure Controlled
	Percent
Poor	25
Near poor	20
Middle/high income	16
<b>Disability status</b> (aged 20 years and older)	
Persons with disabilities	24 (1991–94)
Persons without disabilities	16 (1991–94)

Adults Aged 18 Years and Older With High Blood Pressure, 1988–94 (unless noted)	Blood Pressure Controlled
	Percent
<b>Select populations</b>	
Persons with diabetes	DNA
Persons without diabetes	DNA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.  
Note: Age adjusted to the year 2000 standard population.

**12-11. Increase the proportion of adults with high blood pressure who are taking action (for example, losing weight, increasing physical activity, or reducing sodium intake) to help control their blood pressure.**

**Target:** 95 percent.

**Baseline:** 82 percent of adults aged 18 years and older with high blood pressure were taking action to control it in 1998 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

Adults Aged 18 Years and Older With High Blood Pressure, 1998 (unless noted)	Taking Action To Control Blood Pressure
	Percent
<b>TOTAL</b>	82
<b>Race and ethnicity</b>	
American Indian or Alaska Native	DSU
Asian or Pacific Islander	76
Asian	75
Native Hawaiian and other Pacific Islander	DSU
Black or African American	86
White	80
<b>Hispanic or Latino</b>	
Hispanic or Latino	74
Not Hispanic or Latino	83
Black or African American	87
White	81
<b>Gender</b>	
Female	83
Male	80

Adults Aged 18 Years and Older With High Blood Pressure, 1998 (unless noted)	Taking Action To Control Blood Pressure
	Percent
<b>Family income level</b>	
Poor	80
Near poor	79
Middle/high income	81
<u>Disability status</u>	
Persons with activity limitations	84 (1994)
Persons without activity limitations	76 (1994)
<b>Geographic variation</b>	
Urban	83
Rural	80
<b>Select populations</b>	
Persons with diabetes	DNA
Persons without diabetes	DNA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Note: Age adjusted to the year 2000 standard population.

**12-12. Increase the proportion of adults who have had their blood pressure measured within the preceding 2 years and can state whether their blood pressure was normal or high.**

**Target:** 95 percent.

**Baseline:** 90 percent of adults aged 18 years and older had their blood pressure measured in the past 2 years and could state whether it was normal or high in 1998 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

Adults Aged 18 Years and Older, 1998 (unless noted)	Had Blood Pressure Measured in Past 2 Years and Knew Whether It Was Normal or High
	Percent
<b>TOTAL</b>	90
<b>Race and ethnicity</b>	
American Indian or Alaska Native	89
Asian or Pacific Islander	86
Asian	86
Native Hawaiian and other Pacific Islander	86
Black or African American	92
White	90
Hispanic or Latino	84
Not Hispanic or Latino	91
Black or African American	92
White	91
<b>Gender</b>	
Female	92
Male	87
<b>Education level (aged 25 years and older)</b>	
Less than high school	84
High school graduate	90
At least some college	93
<b>Disability status</b>	
Persons with activity limitations	90 (1994)
Persons without activity limitations	84 (1994)

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.  
 Note: Age adjusted to the year 2000 standard population.

**Cholesterol**

**12-13. Reduce the mean total blood cholesterol levels among adults.**

**Target:** 199 mg/dL (mean).

**Baseline:** 206 mg/dL was the mean total blood cholesterol level for adults aged 20 years and older in 1988–94 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

Adults Aged 20 Years and Older, 1988–94 (unless noted)	Mean Cholesterol Level
	mg/dL
<b>TOTAL</b>	206
<b>Race and ethnicity</b>	
American Indian or Alaska Native	DSU
Asian or Pacific Islander	DSU
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	204
White	206
<b>Hispanic or Latino</b>	
Hispanic or Latino	DSU
Mexican American	205
Not Hispanic or Latino	206
Black or African American	204
White	206
<b>Gender</b>	
Female	207
Male	204
<b>Family income level</b>	
Poor	205
Near poor	204
Middle/high income	206

Adults Aged 20 Years and Older, 1988–94 (unless noted)	Mean Cholesterol Level
	mg/dL
<b>Disability status</b>	
Persons with disabilities	208 (1991–94)
Persons without disabilities	204 (1991–94)

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.  
Note: Age adjusted to the year 2000 standard population.

**12-14. Reduce the proportion of adults with high total blood cholesterol levels.**

**Target:** 17 percent.

**Baseline:** 21 percent of adults aged 20 years and older had total blood cholesterol levels of 240 mg/dL or greater in 1988–94 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

Adults Aged 20 Years and Older, 1988–94 (unless noted)	Total Blood Cholesterol Level of 240 mg/dL or Greater
	Percent
<b>TOTAL</b>	21
<b>Race and ethnicity</b>	
American Indian or Alaska Native	DSU
Asian or Pacific Islander	DSU
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	19
White	21
Hispanic or Latino	DNC
Mexican American	18

Adults Aged 20 Years and Older, 1988–94 (unless noted)	Total Blood Cholesterol Level of 240 mg/dL or Greater
	Percent
Not Hispanic or Latino	DNA
Black or African American	19
White	21
<b>Gender</b>	
Female	22
Male	19
<b>Education level</b>	
Less than high school	22
High school graduate	22
At least some college	19
<u>Disability status</u>	
Persons with disabilities	24 (1991–94)
Persons without disabilities	19 (1991–94)

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Note: Age adjusted to the year 2000 standard population.

**12-15. Increase the proportion of adults who have had their blood cholesterol checked within the preceding 5 years.**

**Target:** 80 percent.

**Baseline:** 67 percent of adults aged 18 years and older had their blood cholesterol checked within the preceding 5 years in 1998 (age adjusted to the year 2000 standard population).

**Target setting method:** Better than the best.

**Data source:** National Health Interview Survey (NHIS), CDC, NCHS.

Adults Aged 18 Years and Older, 1998 (unless noted)	Blood Cholesterol Checked in Past 5 Years
	Percent
<b>TOTAL</b>	67
<b>Race and ethnicity</b>	
American Indian or Alaska Native	58
Asian or Pacific Islander	68
Asian	69
Native Hawaiian and other Pacific Islander	65
Black or African American	67
White	67
Hispanic or Latino	59
Not Hispanic or Latino	68
Black or African American	67
White	70
<b>Gender</b>	
Female	70
Male	64
<b>Education level (aged 25 years and older)</b>	
Less than high school	58
High school graduate	69
At least some college	78
<b>Disability status</b>	
Persons with activity limitations	72 (1993)
Persons without activity limitations	66 (1993)
<b>Geographic variation</b>	
Urban	68
Rural	63

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Note: Age adjusted to the year 2000 standard population.

**12-16. (Developmental) Increase the proportion of persons with coronary heart disease who have their LDL-cholesterol level treated to a goal of less than or equal to 100 mg/dL.**

**Potential data source:** National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.

## CARDIOVASCULAR DISEASE TERMINOLOGY

**Angina (angina pectoris):** A pain or discomfort in the chest that occurs when some part of the heart does not receive enough blood. Angina is a common symptom of coronary heart disease. It often recurs in a regular or characteristic pattern. However, it may first appear as a very severe episode or as frequently recurring bouts. When an established stable pattern of angina changes sharply—for example, it may be provoked by far less exercise than in the past, or it may appear at rest—it is referred to as unstable angina.

**Angioplasty:** A nonsurgical procedure used to treat blockages in blood vessels, particularly the coronary arteries that feed the heart. Also known as percutaneous transluminal coronary angioplasty (PTCA). An inflatable balloon or other device on a thin tube (catheter), fed through blood vessels to the point of blockage, is used to open the artery.

**Anticoagulants:** Drugs that delay the clotting (coagulation) of blood. When a blood vessel is plugged up by a clot and an anticoagulant is given, it tends to prevent new clots from forming or the existing clot from enlarging. An anticoagulant does not dissolve an existing blood clot.

**Arrhythmia:** A change in the regular beat or rhythm of the heart. The heart may seem to skip a beat, or beat irregularly, or beat very fast or very slowly.

**Atherosclerosis:** A type of hardening of the arteries in which cholesterol and other substances in the blood are deposited in the walls of arteries, including the coronary arteries that supply blood to the heart. In time, narrowing of the coronary arteries by atherosclerosis may reduce the flow of oxygen-rich blood to the heart.

**Atrial fibrillation (AF):** The most common sustained irregular heart rhythm encountered in clinical practice. AF occurs when the two small upper chambers of the heart (the atria) quiver instead of beating effectively, and blood cannot be pumped completely out of them when the heart beats, allowing the blood to pool and clot. If a piece of the blood clot in the atria becomes lodged in an artery in the brain, a stroke may result. AF is a risk factor for stroke and heart failure.

**Blood pressure:** The force of the blood pushing against the walls of arteries. Blood pressure is given as two numbers that measure systolic pressure (the first number, which measures the pressure while the heart is contracting) and diastolic pressure (the second number, which measures the pressure when the heart is resting between beats). Blood pressures of 140/90 mmHg or above are considered high, while blood pressures in the range of 130–139/85–89 are high normal. Less than 130/85 mmHg is normal.

**Body mass index (BMI):** Weight (in kilograms) divided by the square of height (in meters), or weight (in pounds) divided by the square of height (in inches) times 704.5. Because it is readily calculated, BMI is the measurement of choice as an indicator of healthy weight, overweight, and obesity.

**Cardiovascular disease (CVD):** Includes a variety of diseases of the heart and blood vessels, coronary heart disease (coronary artery disease, ischemic heart disease), stroke (brain attack), high blood pressure (hypertension), rheumatic heart disease, congestive heart failure, and peripheral artery disease.

**Cerebrovascular disease:** Affects the blood vessels supplying blood to the brain. Stroke occurs when a blood vessel bringing oxygen and nutrients to the brain bursts or is clogged by a blood clot. Because of this rupture or blockage, part of the brain does not get the flow of blood it needs, and nerve cells in the affected area die. Small stroke-like events, such as transient ischemic attacks (TIAs), which resolve in a day or less, are symptoms of cerebrovascular disease.

**Cholesterol:** A waxy substance that circulates in the bloodstream. When the level of cholesterol in the blood is too high, some of the cholesterol is deposited in the walls of the blood vessels. Over time, these

deposits can build up until they narrow the blood vessels, causing atherosclerosis, which reduces the blood flow. The higher the blood cholesterol level, the greater is the risk of getting heart disease. Blood cholesterol levels of less than 200 mg/dL are considered desirable. Levels of 240 mg/dL or above are considered high and require further testing and possible intervention. Levels of 200–239 mg/dL are considered borderline. Lowering blood cholesterol reduces the risk of heart disease.

**Congestive heart failure (or heart failure):** A condition in which the heart cannot pump enough blood to meet the needs of the body's other organs. Heart failure can result from narrowed arteries that supply blood to the heart muscle and from other factors. As the flow of blood out of the heart slows, blood returning to the heart through the veins backs up, causing congestion in the tissues. Often swelling (edema) results, most commonly in the legs and ankles, but possibly in other parts of the body as well. Sometimes fluid collects in the lungs and interferes with breathing, causing shortness of breath, especially when a person is lying down.

**Coronary heart disease (CHD):** A condition in which the flow of blood to the heart muscle is reduced. Like any muscle, the heart needs a constant supply of oxygen and nutrients that are carried to it by the blood in the coronary arteries. When the coronary arteries become narrowed or clogged, they cannot supply enough blood to the heart. If not enough oxygen-carrying blood reaches the heart, the heart may respond with pain called angina. The pain usually is felt in the chest or sometimes in the left arm or shoulder. When the blood supply is cut off completely, the result is a heart attack. The part of the heart muscle that does not receive oxygen begins to die, and some of the heart muscle is permanently damaged.

**Coronary stenting:** A procedure that uses a wire mesh tube (a stent) to prop open an artery that recently has been cleared using angioplasty. The stent remains in the artery permanently, holding it open to improve blood flow to the heart muscle and relieve symptoms, such as chest pain.

**HDL (high-density lipoprotein) cholesterol:** The so-called good cholesterol. Cholesterol travels in the blood combined with protein in packages called lipoproteins. HDL is thought to carry cholesterol away from other parts of the body back to the liver for removal from the body. A low level of HDL increases the risk for CHD, whereas a high HDL level helps protect against CHD.

**Heart attack (also called acute myocardial infarction):** Occurs when a coronary artery becomes completely blocked, usually by a blood clot (thrombus), resulting in lack of blood flow to the heart muscle and therefore loss of needed oxygen. As a result, part of the heart muscle dies (infarcts). The blood clot usually forms over the site of a cholesterol-rich narrowing (or plaque) that has burst or ruptured.

**Heart disease:** The leading cause of death and a common cause of illness and disability in the United States. Coronary heart disease and ischemic heart disease are specific names for the principal form of heart disease, which is the result of atherosclerosis, or the buildup of cholesterol deposits in the coronary arteries that feed the heart.

**High blood pressure (HBP):** A systolic blood pressure of 140 mmHg or greater or a diastolic pressure of 90 mmHg or greater. With high blood pressure, the heart has to work harder, resulting in an increased risk of a heart attack, stroke, heart failure, kidney and eye problems, and peripheral vascular disease.

**Hypertension (See High blood pressure)**

**Ischemic heart disease:** Includes heart attack and related heart problems caused by narrowing of the coronary arteries and therefore a decreased supply of blood and oxygen to the heart. Also called coronary artery disease and coronary heart disease.

**LDL (low-density lipoprotein):** The so-called bad cholesterol. LDL contains most of the cholesterol in the blood and carries it to the tissues and organs of the body, including the arteries. Cholesterol from LDL is

the main source of damaging buildup and blockage in the arteries. The higher the level of LDL in the blood, the greater is the risk for CHD.

**Lipid:** Fat and fat-like substances such as cholesterol that are present in blood and body tissues.

**Peripheral vascular disease:** Refers to diseases of any blood vessels outside the heart and to diseases of the lymph vessels. It is often a narrowing of the blood vessels that carry blood to leg and arm muscles. Symptoms include leg pain (for example, in the calves) when walking and ulcers or sores on the legs and feet.

**Stroke:** A form of cerebrovascular disease that affects the arteries of the central nervous system. A stroke occurs when blood vessels bringing oxygen and nutrients to the brain burst or become clogged by a blood clot or some other particle. Because of this rupture or blockage, part of the brain does not get the flow of blood it needs. Deprived of oxygen, nerve cells in the affected area of the brain cannot function and die within minutes. When nerve cells cannot function, the part of the body controlled by these cells cannot function either.