

Chronic Disease Management and Control Branch

Heart Disease and Stroke Prevention Program

2012 Heart Attack Fact Sheet

What is a Heart Attack?^{1,2,3}

Heart attacks, otherwise known as myocardial infarctions, are caused when the blood supply to a section of the heart is suddenly disrupted. Without the oxygen supplied by blood, the portion of the heart muscle fed by the blocked artery can become damaged. If blood flow is not restored, the cells within the heart muscle will start to die. Heart attacks are often caused by coronary heart disease (CHD), or the narrowing or hardening of the arteries due to a build-up of plaque. This process occurs over many years. Plaque can become damaged and the formation of a blood clot can develop. This blood clot may eventually block an artery causing a heart attack.



Heart attacks can be classified by the results of an ECG into two types: Non-ST segment elevation myocardial infarction (NSTEMI) or ST segment elevation myocardial infarction (STEMI). NSTEMI may be a partial or temporary blockage of blood supply to the heart with more minimal damage. STEMI is indicative of a prolonged blockage of blood supply and results in more extensive heart damage. The Hawaii Heart Disease and Stroke Prevention Program has focused on STEMI because of its more serious nature.



Risk Factors for Heart Attack²

Conditions such as high blood pressure, high blood cholesterol, obesity, and diabetes can raise your risk of a heart attack. Behaviors such as unhealthy diet, low levels of physical activity, smoking, and excessive alcohol consumption can contribute to the conditions that can cause heart attacks. Some factors, such as age and family history of heart disease, cannot be modified but are associated with a higher risk of heart attack.

¹ National Heart Lung and Blood Institute. Diseases and Conditions Index. What is a heart attack? <http://www.nhlbi.nih.gov/health/health-topics/topics/heartattack/>. Accessed January 19, 2012.

² Centers for Disease Control and Prevention. Heart Disease. Heart attack. http://www.cdc.gov/heartdisease/heart_attack.htm. Accessed January 19, 2012.

³ Cleveland Clinic. Diseases and Conditions. Types of Heart Attacks. http://my.clevelandclinic.org/heart/disorders/cad/mi_types.aspx. Accessed January 19, 2012.

The Impact of Heart Attacks

Every 34 seconds, an American will have a heart attack and about 15% of people who experience a heart attack will die of it.⁴ Approximately 7,900,000 Americans have had a heart attack or 3.1% to 4% of the U.S. adult population.⁴ It is estimated that every year 610,000 Americans will have a new heart attack and 325,000 Americans will have a recurrent heart attack.⁴ People who have had a heart attack are 4 to 6 times more likely than the general population to die suddenly.⁴

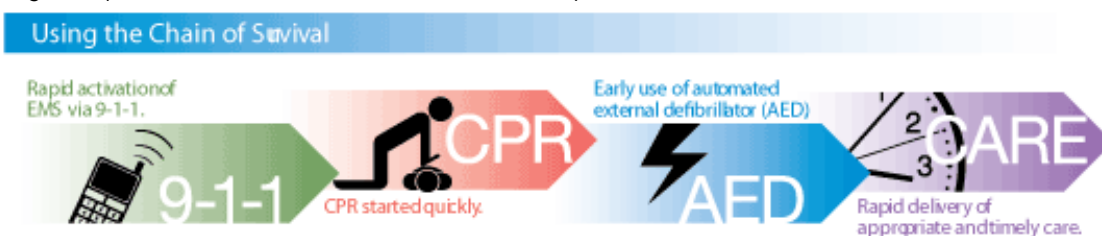
The Economic Impact of Heart Attacks

In 2004, acute heart attack was responsible for \$31 billion in inpatient hospital charges and 695,000 hospital stays.⁴ On average, Medicare paid \$14,009 per heart attack discharge in 2006.⁴ Heart attacks cause significant economic impacts through loss of productivity and premature death. On average, a heart attack will cause a loss of 16.6 years of life.⁴

Heart Attack Treatment and Rehabilitation^{5,6}

A heart attack requires emergency medical attention and timeliness is critical. Witnesses to a heart attack should initiate the chain of survival (Figure 1). Of patients suffering a heart attack, 49.5% do not

Figure 1 (Centers for Disease Control and Prevention)



get to the hospital within 4 hours of symptom onset.⁴ Timely arrival to the hospital is critical to receive life-saving treatment. Heart attacks can be treated with medication, such as clot-busting drugs and/or aspirin, or angioplasty (also known as percutaneous coronary intervention). Angioplasty involves threading a small balloon into the blocked artery then inflating the balloon to open the artery. This process may involve adding a stent to help keep the artery open. In some cases a doctor may perform bypass surgery where a vein or artery from another part of the body will be used to bypass the blocked artery in the heart to restore blood flow. Following a heart attack, a doctor may suggest cardiac rehabilitation. The benefits of cardiac rehabilitation include reduced mortality, reduced symptoms, improved health-related quality of life, reduced hospitalization and use of medical resources and increased positive lifestyle changes.⁷ However, only a third of heart attack survivors participate in outpatient cardiac rehabilitation.⁴ Cardiac rehabilitation is particularly underutilized by women and the elderly.⁴

⁴ Roger VL, et al. Heart disease and stroke statistics 2011 update: A report from the American Heart Association. *Circulation* 2011;123:e18-e209; published online Dec 15, 2010. DOI: 10.1161/CIR.0b013e3182009701

⁵ Centers for Disease Control and Prevention. Heart Disease. Heart Attacks. http://www.cdc.gov/heartdisease/heart_attack.htm. Accessed January 19, 2012.

⁶ National Heart, Lung, and Blood Institute. How is a Heart Attack Treated? <http://www.nhlbi.nih.gov/health/health-topics/topics/heartattack/treatment.html>. Accessed January 19, 2012.

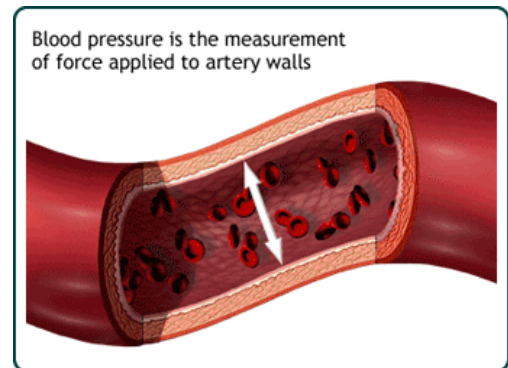
⁷ American Association of Cardiovascular and Pulmonary Rehabilitation. Cardiac & pulmonary rehabilitation fundamentals. <http://www.aacvpr.org/Resources/CardiacPulmonaryRehabFundamentals/tabid/256/Default.aspx>. Accessed July 20, 2011.

Prevalence of Preventable Risk Factors in Hawaii

High Blood Pressure:

Blood pressure is the force of blood pushing against the artery walls (Figure 2). Chronic high blood pressure can cause hardening of the artery walls which can eventually cause decreased blood flow. High blood pressure is often referred to as a “silent killer.” In Hawaii, 30.2% of adults reported that they have been told by a health care professional that they have high blood pressure (Figure 3). High blood pressure is more common in people with lower educational attainment, lower household income, people older than 55 years, retirees and residents unable to work, and people of Native Hawaiian or Japanese ethnicity.

Figure 2 (Centers for Disease Control and Prevention)



High Blood Cholesterol:

Blood cholesterol is a waxy, fat-like substance that is made in the body and is present in many foods. Too much cholesterol in the blood can cause a build-up on the artery walls (called plaque) that can narrow the artery allowing less blood to pass through. In Hawaii, 38.9% of adults reported that they were told by a health care professional they had high blood cholesterol (Figure 3). The prevalence of high blood cholesterol increases with age but is common across ethnicities, counties, and people of all educational and household income categories. High blood cholesterol is particularly common in retirees and those unable to work, Japanese, and older Hawaii residents.

Diabetes:

Diabetes is a group of diseases characterized by high levels of blood glucose or blood sugar that results from improper production or use of the hormone insulin. High blood sugar can lead to hardening of the blood vessels and is also linked to increases in blood pressure. In Hawaii, 8.3% of adults reported that they have diabetes (Figure 3). However, diabetes increases with age and is present in 17.9% of adults aged 65 or more and in 18.3% of retirees and those unable to work. Native Hawaiians and those with low educational attainment or low household income tend to have a higher prevalence of diabetes. There is little difference in prevalence between genders or among counties.



Smoking:

Smoking speeds up the progression of atherosclerosis, the process of plaque build-up and hardening of the arteries, and increases the likelihood of a blood clot by causing platelets to clump together.⁸ In Hawaii, 14.5% of adults reported that they are current smokers (Figure 3) and 10.7% of adults say they smoke every day. Smoking is most common in the 25 to 34 year old age group, Native Hawaiians, adults with less than a high school education, those with lower household income, and in residents of Hawaii County compared to Honolulu County. Unemployed residents of Hawaii are more likely to smoke than students or homemakers and retirees (23.0% vs. 12.1% and 10.9%, respectively).

⁸ The 2004 Surgeon General's Report. *The Health Consequences of Smoking*. http://www.cdc.gov/tobacco/data_statistics/sgr/2004/pdfs/whatitmeanstoyou.pdf. Accessed March 6, 2012.

Physical Inactivity:

Not getting regular physical activity is a risk factor for high blood pressure, high cholesterol, and diabetes, all of which are the primary risk factors for heart attack. In Hawaii, 19.2% of adults reported that they participated in no leisure time exercise or physical activity in the past 30 days. Some groups that tend to report lower levels of physical activity include older adults, Japanese, Filipinos, females, those with less than a high school education, those who are retired or can't work, and those with lower household incomes. There was little difference in prevalence of physical inactivity by county.



Overweight and Obesity:

Body Mass Index (BMI), a surrogate indicator of body fat, is often used as a measure of overweight and obesity. Overweight and obesity results from consuming more calories than are expended and strain the cardiovascular system by increasing the risk of high blood pressure, high blood cholesterol, and diabetes. There is some research that suggests other measures of fat distribution, such as waist circumference and waist-to-hip ratio, may be more closely associated with increased risk of poor health outcomes.⁹ In Hawaii, 34.1% of adults are overweight and 23.1% are obese (Figure 3). This means 57.2% of Hawaii's adults are carrying excess weight. Overweight is more common in men compared to women. Overweight is common across age groups, household incomes, and counties. Native Hawaiians and those of lower educational attainment and household income tend to have a higher prevalence of obesity. Obesity is also high among those aged 25 to 44 years and the unemployed.

Low Fruit and Vegetable Consumption:

Diets rich in fruits, vegetables, whole grains, fat free or 1% milk, lean meats, poultry, fish, beans, eggs, and nuts and low in saturated fats, trans fats, cholesterol, salt (sodium), and added sugars are optimal for maintaining a healthy weight. Consumption of five or more servings of fruits and vegetables every day is recommended to achieve a healthy diet. In Hawaii, 76.5% of adults fail to eat fruits or vegetables at least five times per day (Figure 3). This is more commonly seen among males, people in the 18 to 24 year age group, and the Japanese.



Excessive Alcohol Consumption:

Moderate alcohol consumption has been shown to reduce the risk of coronary heart disease.¹⁰ However, heavy alcohol consumption, defined as greater than 2 drinks per day for men and greater than 1 drink per day for women, is associated with increases in alcoholism, high blood pressure, obesity, and stroke.¹⁰ Additionally, excessive alcohol consumption can lead to a higher caloric intake and higher triglyceride levels.¹⁰ In Hawaii, 6.6% of the adult population self-reported heavy drinking in 2010 (Figure 3). The prevalence of heavy drinking is higher among the younger age groups (25-34 years), men, and Native Hawaiian adults. The

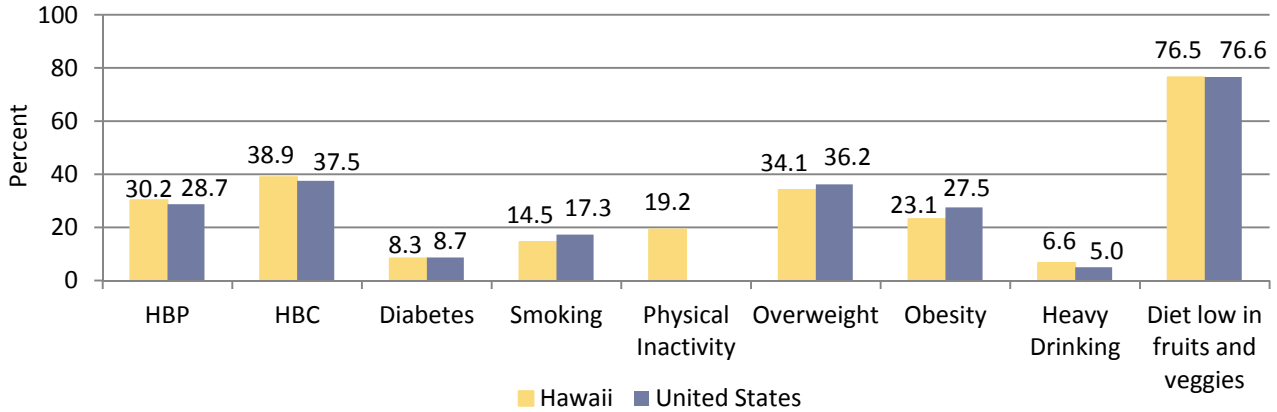
⁹ Lewis CE, McTigue KM, Burke LE, et al. Mortality, health outcomes, and body mass index in the overweight range. A science advisory from the American Heart Association. *Circulation*. 2009;119.

<http://circ.ahajournals.org/content/119/25/3263.full.pdf+html>. Accessed January 19, 2012.

¹⁰ American Heart Association. Alcoholic Beverages and Cardiovascular Disease. http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/Alcohol-Wine-and-Cardiovascular-Disease_UCM_305864_Article.jsp. Accessed March 6, 2012.

prevalence of heavy drinking is similar across categories of household income, employment, and county residence.

Figure 3: Adult Prevalence of Select Chronic Conditions and Risk Factors, U.S. and Hawaii 2009/2010

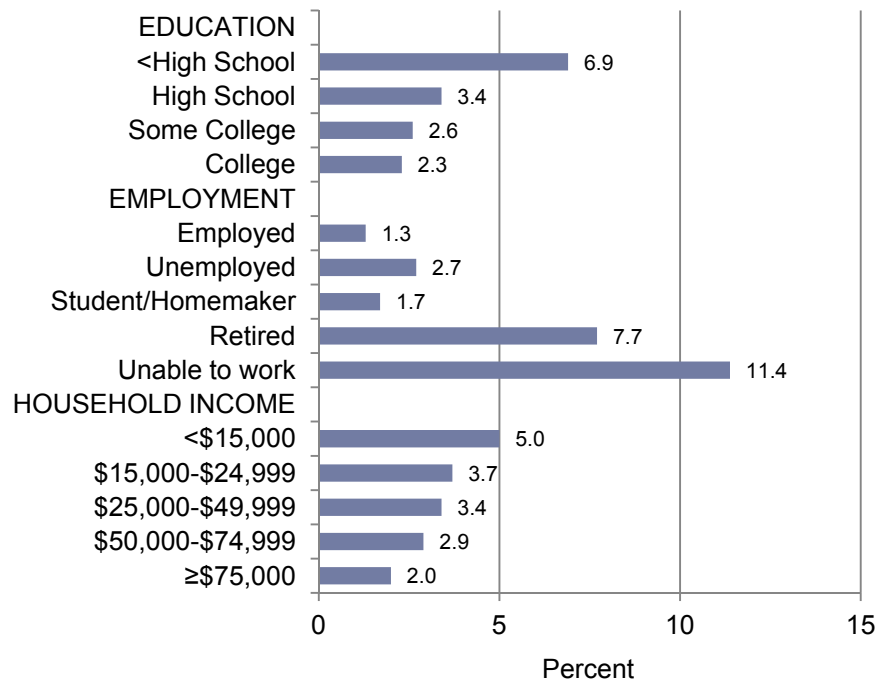


Source: Hawaii Behavioral Risk Factor Surveillance System, U.S. Behavioral Risk Factor Surveillance System, 2009/2010
 Note: Prevalence of diabetes does not include gestational diabetes; U.S. includes the 50 states and the District of Columbia; data on HBP (high blood pressure), HBC (high blood cholesterol), and diet low in fruits and veggies comes from 2009 BRFSS; data on diabetes, smoking, physical inactivity, overweight, obesity, and heavy drinking comes from 2010 BRFSS

Prevalence of Heart Attack in Hawaii¹¹

In 2010, 2.9% of Hawaii adults reported that a health care professional told them they had a heart attack. The prevalence of heart attack was highest among residents who were unable to work (11.4%) or retired (7.7%), residents with less than \$15,000 in household income (5.0%), and residents with less than a high school education (6.9%). The adult prevalence of heart attack also increased with age. The prevalence of heart attack is disproportionately higher in Hawaii residents with low socioeconomic status, or the social and economic conditions that can determine a person’s risk for disease. Three measures that contribute to a person’s socioeconomic status are educational attainment, employment, and household income. The prevalence of heart attack is highest in Hawaii residents

Figure 4: Adult Heart Attack Prevalence by Socioeconomic Status, Hawaii 2010



Source: Hawaii Behavioral Risk Factor Surveillance System

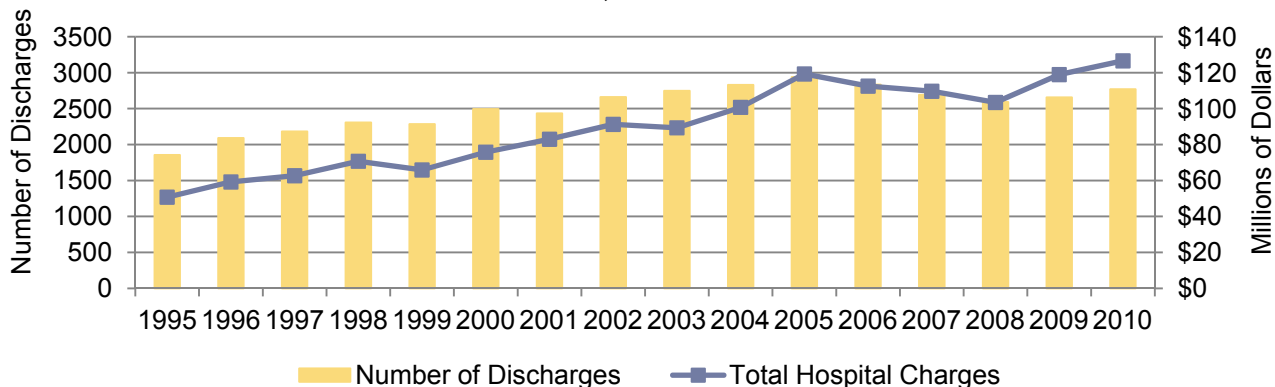
¹¹ Data Source: Hawaii Behavioral Risk Factor Surveillance System

that are the most vulnerable: those with a high school education or less, those with lower household income, and those that are unemployed, retired, or unable to work (Figure 4). The prevalence of heart attack is greater in men than in women but there was little different in prevalence among the counties.

Heart Attack Hospitalizations in Hawaii¹²

In 2010, heart attacks caused 2,770 inpatient hospital visits or 2.9% of all non-obstetric or neonatal hospitalizations in Hawaii. Patients hospitalized for heart attack spend an average of 5.2 days in the hospital. The number of hospital discharges with a primary diagnosis of heart attack has been increasing and hospital charges have continued to climb (Figure 5). In Hawaii, heart attacks resulted in \$127 million in hospital charges (Figure 5) at an average of \$45,697 per hospital visit in 2010. In Hawaii, the average charge per heart attack discharge increased from \$27,350 in 1995 to \$45,697 in 2010, an increase of 67%.

Figure 5: Heart Attack Hospital Discharges and Hospital Charges (in Millions) in Hawaii, 1995 - 2010



Source: Hawaii Health Information Corporation

Heart Attack Hospital Costs in Hawaii¹²

- Every year heart attacks costs \$126,579,883
 - Every day heart attacks costs \$346,794
 - Every hour heart attacks costs \$14,450

Awareness of the Signs and Symptoms of Heart Attack¹³

In 2009, Hawaii BRFSS participants were asked if they thought the symptoms listed in Table 1 were symptoms of heart attack. Of the five signs and symptoms of heart attack, chest pain or discomfort was the most recognized symptom with 89.1% of Hawaii adults reporting knowing that is a symptom of heart attack (Table 1). However, only 30.6% of Hawaii adults were aware of all five signs and symptoms of heart attack (Table 1). Additionally, 89.6% Hawaii adults reported that they

¹² Data Source: Hawaii Health Information Corporation

¹³ Data Source: Hawaii Behavioral Risk Factor Surveillance System

would call 911 as the first thing they would do if they thought someone was having a heart attack or stroke.

Pain or discomfort in the jaw, neck, or back	49.4%
Feeling weak, light headed, or faint	60.1%
Chest pain or discomfort	89.1%
Pain or discomfort in the arms or shoulder	75.7%
Shortness of breath	79.5%
Aware of all five heart attack signs and symptoms	30.6%

Source: Hawaii Behavioral Risk Factor Surveillance System

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