Texas Plan to Reduce Cardiovascular Disease and Stroke

2008

TEXAS
Department of
State Health Services

Foreword

In 2002, the first *Texas Plan to Reduce Cardio-vascular Disease and Stroke* (*Plan*) was developed to provide a set of goals and action steps for addressing the burden of heart disease and stroke in Texas. The *Plan* was updated in 2005 to reflect the progress that had been made and to identify new priorities for the state. Once again, in 2008, the *Plan* has been updated, this time with the help of a broader group of experts contributing a wide variety of local and organizational perspectives.

The 2008 *Plan* represents the efforts of diverse partners from state and community level public health agencies, the healthcare industry, worksite wellness professionals, the non-profit and academic sectors, and community stakeholders from cities around Texas. The *Plan* identifies heart disease and stroke prevention, detection, and treatment priorities that need to be and, working collaboratively, can be addressed across the state.

The *Plan* is designed to provide an overview of the state of cardiovascular disease and stroke in Texas and identify priority objectives for organizations to incorporate into their organizational and collaborative planning. Priorities in the *Plan* stem from an assessment of the heart disease and stroke prevention system in Texas as well as an analysis of the state's mortality, morbidity, prevalence, and related risk factor data.

Efforts will be coordinated at the state level for some strategies, but others can only be effectively implemented at the local or organizational level. Success of this *Plan* will take partners in all sectors and at all levels working collaboratively to achieve what one cannot accomplish alone.

The Texas Council on Cardiovascular Disease and Stroke, a council established by the legislature and appointed by the Governor, continues to work with stakeholders to implement the *Plan* and promote the mission of the council to educate, inform and facilitate action among Texans to reduce the human and financial toll of cardiovascular disease and stroke.

> ## Texas Council on Cardiovascular Disease and Stroke
>
> ——Mission——
> *"to educate, inform and facilitate action among Texans to reduce the human and financial toll of cardiovascular disease and stroke"*

The Texas Heart Disease and Stroke Prevention System Partnership has worked diligently over the past two years to provide information and expert advice on the development of the new *Plan*. Member organizations of the Partnership Steering Committee are committed to its successful implementation and invite you to join their efforts. Please use this *Plan* in setting your own objectives to improve the lives of those affected. Implement the strategies identified to bring about, in collaboration with others, improved cardiovascular and brain health for all Texans. Your participation in and adoption of the strategies outlined in this *Plan* are critical to the success of this collaborative effort.

Acknowledgements

This *Plan* was developed over a two-year period through joint planning meetings and considerable e-mail and teleconference coordination among organizations participating in the Texas Heart Disease and Stroke Prevention System Partnership. Several members, representing key organizations in the fight to prevent and reduce cardiovascular disease and stroke, served as Steering Committee members and played critical roles in the update of this *Plan*.

Texas Association of Local Health Officials
Michelle Hunter
Larry Johnson
Lee Lane

American Heart Association
Suzanna Summerlin

Texas Medical Association
Nancy Bieri
Audra Bryant

Texas Medical Foundation
Kevin Warren

Texas Public Health Association
Terri Pali

In addition, a number of staff from the Department of State Health Services played key roles in coordinating meetings, facilitating planning, and writing and editing drafts of the *Plan*.

Center for Program Coordination
Mike Gilliam
Mike Messinger

Office of Regional/Local Health Services
Dan Smith

Office of Emergency Management Systems
Steve Janda

HHS Printing Services
Veronica Primeaux – *Plan* layout

Chronic Disease Branch/Cardiovascular Health and Wellness Program
Dr. Weihua Li – data retrieval
Velma Ortega
Jane Osmond – *Plan* writer
Reuben Parrish
Jennifer Smith – Program Director
Mary Somerville
Brett Spencer

The members of the Texas Council on Cardiovascular Disease and Stroke are to be recognized for their willingness to give of their time and expertise as they work to fulfill their charge to maintain and implement a cardiovascular disease plan for the state of Texas.

Walter Buell, MD, PA
Kate Darnell, MS
Grace Elinsway, MEd
Michael Hawkins, MD
Bob Hillert, MD, FACC, FACP, FAHA
Deanna Hoelscher, PhD, RD, LD, CNS
Carolyn Hutchinson, RN, BSN
Barbara Keir

Erica Swegler, MD
Sheila Tello, RN
Thomas Tenner, Jr, PhD
Marissa Rathbone
J. Neal Rutledge, MD
Martha Simien, MEd
Michael Wilson, PhD

The majority of data for the *Plan* were obtained from the Center for Health Statistics, Texas Department of State Health Services.

Table of Contents

Executive Summary

Cardiovascular disease and stroke are the number one and number three causes of death in Texas and the nation. These devastating diseases are largely preventable through the reduction of modifiable risk factors. Increased physical activity; good nutrition; tobacco cessation; control of high blood pressure, high blood cholesterol, and diabetes; and reduction of overweight and obesity can all help reduce CVD and stroke.

The *Texas Plan to Reduce Cardiovascular Disease and Stroke* 2008 (*Plan*) was developed through collaboration between the Texas Council on Cardiovascular Disease and Stroke and the Texas Heart Disease and Stroke Prevention System Partnership and provides a set of goals, objectives, and strategies for reducing morbidity and mortality from heart disease and stroke in Texas.

The *Plan* is based on a framework for action that uses the four goals of the Centers for Disease Control and Prevention for addressing heart disease and stroke. A fifth goal focuses on building state and local capacity for implementing the *Plan*.

Thirty-one objectives were identified under the five goals as priorities for Texas. The objectives reflect Healthy People 2010 objectives that are specific to heart disease and stroke, are measurable using mainly existing data sources, and felt to be realistic and achievable if all stakeholders working to reduce heart disease and stroke in Texas work collaboratively and use resources effectively.

Goals of the 2008 *Plan*:

Goal I: Texans will experience improved cardiovascular health and quality of life through the prevention of risk factors.

Goal II: Texans will experience improved cardiovascular health and quality of life through the detection and treatment of risk factors.

Goal III: Texans will experience improved cardiovascular health and quality of life through the early detection and treatment of heart attack and stroke.

Goal IV: Texans will experience improved cardiovascular health and quality of life through the prevention of recurrent events.

Goal V: Texans will experience improved state and local capacity to address heart disease, stroke, and related risk factors.

A set of evidence-based or promising strategies present a public health, population-based approach to addressing heart disease, stroke, and related risk factors in the state. Working together to implement these strategies, the Texas Heart Disease and Stroke Prevention System Partnership will strive to achieve identified targets by the year 2012.

Call to Action:

Understanding the burden of cardiovascular disease and stroke in Texas and working collaboratively to implement the *Texas Plan to Reduce Cardiovascular Disease and Stroke* is a charge to be taken up at the state, regional, and community levels. Stakeholders involved at all levels can use this *Plan* to decide where they fit into a unified, coordinated effort to reduce premature death from cardiovascular disease and stroke and improve quality of life for Texans diagnosed with heart disease and stroke.

Introduction

Cardiovascular disease and stroke remain the number one and number three causes of death in Texas and account for nearly one third of all deaths in our state. In addition to the human and emotional toll, the financial burden of cardiovascular disease and stroke in Texas exceeded ten billion dollars in hospitalization charges in 2006. A number of trends indicate this burden will only increase in the future:

- ❤ The aging of the population will be an increasing factor as "baby boomers" reach ages when cardiovascular disease and stroke are most prevalent.

- ❤ The prevalence of morbid obesity in Texas is rising. More than one in five adult Texans are obese, and over two thirds of adult Texans are overweight or obese.

- ❤ Health care, school, and work sites are not keeping pace with the need for healthier food choices and an environment conducive to increasing physical activity.

- ❤ The availability of epidemiological data for CVD and stroke is not keeping pace with the need for stakeholders to understand and address the burden of disease.

In response to these challenges, the Texas Heart Disease and Stroke Prevention System Partnership (Partnership) was created to work in collaboration with the Texas Council on Cardiovascular Disease and Stroke to update and implement a statewide plan for addressing cardiovascular disease and stroke in Texas.

The ***2008 Texas Plan to Reduce Cardiovascular Disease and Stroke*** (***Plan***) not only reflects a new set of goals, objectives, and strategies for improving cardiovascular and brain health in Texas, but also includes objectives and strategies related to four essential components of a comprehensive public health plan as identified by the Centers for Disease Control and Prevention (CDC)[1]:

- **Taking Action:** All Texans and all Texas public and private agencies and organizations must take action to modify behaviors, implement policies, and adapt the environments in which we live and work to successfully translate current knowledge into successful outcomes.

- **Building Capacity:** State and local governments, public health agencies, and community leaders must work to build local and statewide capacity to address the health and wellness of Texans using new competencies, expanding partnerships, and bringing resources to bear in a more coordinated and integrated way.

- **Evaluating Impact:** Resources must be dedicated to developing new, enhancing existing, and effectively implementing systematic monitoring of health indicators related to cardiovascular disease and stroke and evaluating the health impact of interventions.

- **Advancing policy:** Critical policy issues must be addressed and effective public policy must be implemented to ensure resources are available, the environment is conducive to the health and wellness of Texans, and all citizens have access to quality prevention and treatment services.

By implementing a set of evidence-based or promising strategies using a coordinated, public health approach that includes:

- data and surveillance,
- public health education and outreach,
- community policy and environmental change, and
- clinical treatment and prevention

Texas stakeholders can work together to reduce premature death and disease and improve quality of life for all Texans.

The Burden of Cardiovascular Disease and Stroke in Texas

Cardiovascular disease (CVD) refers to a group of diseases that target the heart and blood vessels and is the result of complex interactions between multiple inherited traits and environmental issues including diet, body weight, blood pressure, and lifestyle habits. This means that cardiovascular disease is largely preventable and, when diagnosed early, disease symptoms and risk factors can often be mitigated with lifestyle change and medication. Common forms of CVD include high blood pressure, coronary heart disease, stroke, and congestive heart failure.

A major cause of CVD is atherosclerosis, a general term for the thickening and hardening of the arteries. It is characterized by deposits of fatty substances, cholesterol, and cellular debris in the inner lining of an artery. The resulting buildup is called plaque, which can partially or completely occlude a vessel and may lead to heart attack or stroke. The most prevalent forms of heart disease and stroke, in which narrowed or blocked arteries result in decreased blood supply to the heart or brain, are referred to as ischemic heart disease and ischemic stroke. This *Plan* deals largely with these two types of cardiovascular disease.

According to the American Heart Association (AHA), over 80 million, or one out of every three Americans, are estimated to have one or more types of cardiovascular disease.[2]

In 2007, about 1.5 million Texas adults had been diagnosed with CVD or stroke.[3]

Cardiovascular disease continues to be the number one cause of death in Texas and in the United States (US). Nearly 2,400 Americans die from CVD each day.[2] Thirty-two percent of all deaths in Texas in 2005 were due to heart disease and stroke.[4]

Yet, progress is being made. From 1994 through 2004, mortality rates (number of deaths per 100,000 population) from CVD in Texas, as in the US, steadily declined. The death rate from CVD in Texas declined 19.5 percent during this ten year period.[2] Factors affecting this decline include more effective medical treatment and more emphasis on reducing controllable risk factors.

While CVD mortality rates have declined, the financial burden from CVD continues to rise. Together, heart disease and stroke are the number one drain on health care resources. According to the AHA, the estimated direct and indirect cost of CVD in the US in 2008 will be $448.5 billion.[2] In 2006, hospitalization charges for CVD and stroke in Texas were over $10 billion. Ischemic heart disease alone accounted for 60 percent of these charges.[5]

The American Heart Association has estimated the direct and indirect cost of CVD in the US for 2008 will be $448.5 billion.

Diseases of the Heart

In Texas, diseases of the heart claimed over 39,990 lives in 2005.[4] Heart disease has been the leading cause of death in Texas since 1940 and currently accounts for one out of every four deaths. Diseases of the heart include acute rheumatic fever, chronic rheumatic heart diseases, hypertensive diseases, ischemic heart diseases, as well as other forms.

The *Plan* focuses primarily on ischemic and hypertensive heart diseases, which account for 74 percent of all diseases of the heart in Texas. Hospital charges for ischemic heart disease in Texas in 2006 exceeded $6 billion.[5]

The first appearance of heart disease is all too often sudden and devastating. Each year in the US, approximately 400,000 persons die of unexpected sudden cardiac death in an emergency department or before reaching the hospital.[6]

Brain death and permanent death start to occur within four to six minutes after cardiac arrest. Cardiac arrest can be reversed if treated within a few minutes with an electric shock to the heart to restore a normal heartbeat (defibrillation). With every minute that passes without cardiopulmonary resuscitation (CPR) and defibrillation, the chance of survival is reduced by 7 to 10 percent; and after ten minutes without intervention, few attempts at resuscitation succeed.[7] For this reason, bystander recognition of the signs and symptoms of cardiac arrest and an immediate call to 911 are critical in improving patient outcomes. In 2005, 85 percent of Texas adults recognized 911 as the first emergency response option for heart attack and stroke, but only 9 percent could correctly identify all heart attack signs and symptoms.[3]

In the event of a cardiac arrest, CPR and the use of an automated external defibrillator (AED) should begin immediately. The availability of AEDs is becoming more widespread as many municipal and state governments are mandating AED programs in public sites such as schools, shopping malls, and gymnasiums. Recent recommendations for CPR performed by bystanders include the provision of high quality chest compressions by pushing hard and fast in the middle of the chest with minimal interruptions.[8] Public education about the rapid recognition of the signs and symptoms of cardiac arrest and stroke, calling 911, and providing CPR and defibrillation is a focus in the 2008 *Plan*.

Brain death and permanent death start to occur within four to six minutes after someone experiences cardiac arrest.

Stroke

Stroke is the third leading cause of death in Texas and in the nation. Over the decade between 1994 and 2004, the death rate from stroke in Texas declined by 19 percent.[2] The age-adjusted mortality rate for stroke in Texas in 2005 was 52.1. An estimated 2.8 percent of the Texas adult population was diagnosed with stroke in 2007.

More people are surviving strokes, but not without consequences. Stroke can leave a range of disabilities from loss of speech to paralysis of limbs and other neurological impairments, making stroke a leading cause of long-term disability and a major economic burden in terms of health care costs and lost productivity.[9] The estimated direct and indirect cost of stroke in the US in 2008 is $65.5 billion. [2]

The mean lifetime cost of ischemic stroke in the US is estimated at $140,048, including inpatient, rehabilitation, and follow-up care.[2] Total hospital charges for stroke in Texas in 2006 exceeded $1.9 billion.[5]

The good news is stroke is preventable and, when treated immediately, the damage can be minimized. This requires early recognition of signs and symptoms and rapid response. According to the Behavioral Risk Factor Surveillance System (BRFSS), in 2005 only 17 percent of Texas adults could correctly identify all signs and symptoms of stroke (Figure 1). Several national stroke awareness campaigns exist to educate the public about the importance of early recognition of signs and symptoms of stroke and the importance of calling 911. Supporting and expanding these campaigns will help ensure that all Texas adults can recognize a stroke and take immediate action.

Figure 1

Symptoms of Stroke	Percent of Respondents who Recognized Symptoms of Stroke
Sudden confusion, trouble speaking or understanding	76.3%
Sudden trouble seeing in one or both eyes	61.6%
Sudden numbness or weakness of the face, arm or leg	86.5%
Sudden trouble walking, dizziness or loss of balance and coordination	78.2%
Sudden severe headache with no known cause	57.4%
Recognized all 5 signs and symptoms	17%

Data source: BRFSS, Center for Health Statistics, DSHS, 2005

In addition to early recognition of stroke, early and appropriate intervention is critical to increase survival and reduce risk of disability. Stroke care in many communities is inadequate and fragmented.[9] A focus of the *Plan* is to support Texas communities as they work to improve the emergency health care system, particularly as it relates to the stroke system of care.

Disparities in Cardiovascular Disease and Stroke

Priority Populations

CVD causes more deaths among both genders and all racial and ethnic groups than any other disease, but overall, Texans who are older, poorer, less well educated, or are African American have a higher prevalence of heart disease and stroke, more risk factors, and are at higher risk of death from cardiovascular disease and stroke (Figures 2 & 3). Risk for ischemic heart disease and stroke increases with age, the vast majority occurring in Texans over 65.

Figure 2

Prevalence of Stroke by Demographic, Texas, 2007

Weighted Percent %

Demographic	Value
Nationwide	2.7%
Texas	2.8%
Males	2.6%
Females	3.0%
Whites	2.9%
Afr. Americans	4.4%
Hispanics	2.1%
18-29	0.6%
30-44	0.8%
45-64	3.6%
65+	9.1%
No H.S. Diploma	4.8%
H.S. Graduate	3.5%
Some College	2.2%
College +	1.7%
<$25,000	4.7%
$25,000-$49,999	2.3%
$50,000+	1.4%

Data source: BRFSS, Center For Health Statistics, DSHS, 2007

Figure 3

Prevalence of Heart Disease by Demographic, Texas, 2007

Weighted Percent %

Demographic	Value
Nationwide	6.5%
Texas	6.7%
Males	7.3%
Females	6.1%
Whites	7.8%
African-American	5.7%
Hispanics	5.2%
18-29	1.8%
30-44	2.2%
45-64	8.7%
65+	20.4%
No High School Diploma	10.5%
High School Graduate	7.1%
Some College	6.4%
College +	4.6%
<$25,000	9.7%
$25,000-$49,999	6.4%
$50,000+	4.3%

Data source: BRFSS, Center for Health Statistics, DSHS

Although CVD and stroke mortality rates have declined for most populations, disparities persist (Figures 4 & 5). The highest mortality rates from cardiovascular disease and stroke are found among the African American population, both in Texas and in the US. In Texas, the 2005 age-adjusted mortality rate for ischemic heart disease among African Americans was 190.2 compared to 153.3 for Whites and 139.8 for Hispanics. The 2005 ischemic heart disease mortality rate among Hispanic Texans (139.8) was slightly higher than it was in 2004 (131). The 2005 mortality rate for stroke among African Americans was 76.4 compared to 50.7 for Whites and 44.9 for Hispanics. Demographic disparities contribute to geographic differences in prevalence and mortality rates from CVD and stroke among Texas' urban, rural and border regions (Figures 6 & 7).

Figure 4
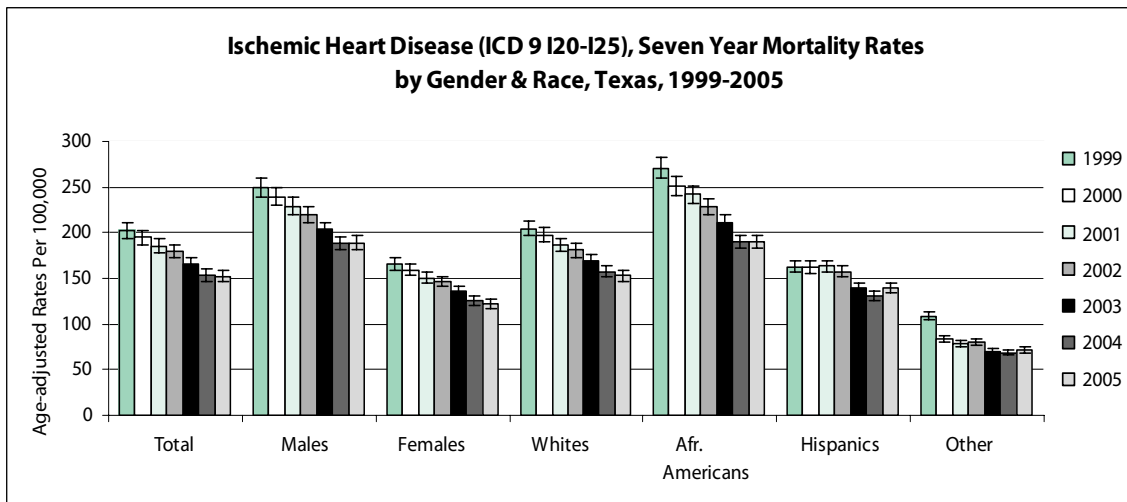
Ischemic Heart Disease (ICD 9 I20-I25), Seven Year Mortality Rates by Gender & Race, Texas, 1999-2005

Data source: Texas Vital Statistics Unit, Center for Health Statistics, DSHS

Figure 5

Stroke (ICD 10 I60-I69), Seven Year Mortality by Gender & Race, Texas, 1999-2005
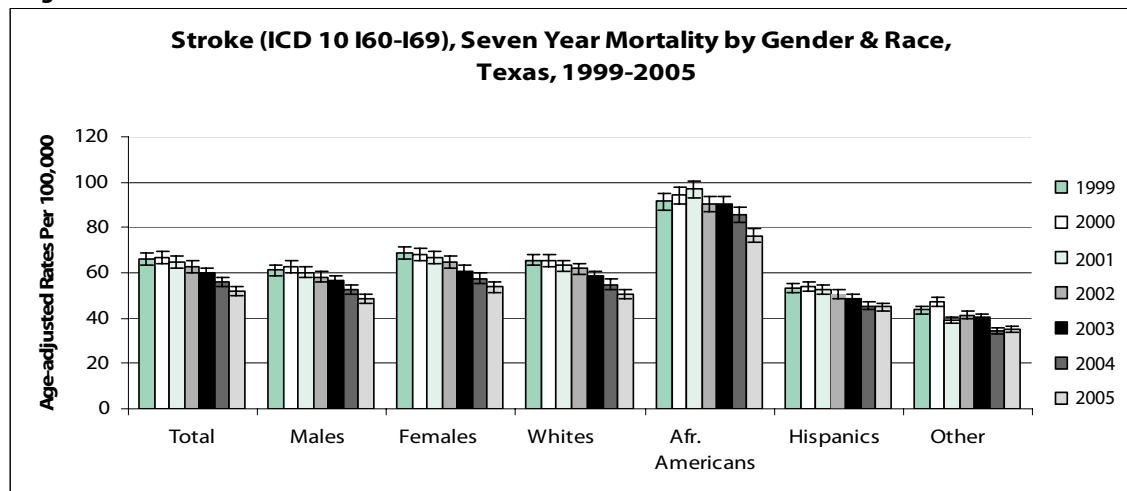
Data source: Texas Vital Statistics Unit, Center for Health Statistics, DSHS

Figure 6

Five Year Average Age-Adjusted Mortality Rates for Ischemic Heart Disease, Texas, 2001-2005

Age-Adjusted Mortality Rates Per 100,000
Average State Rate 166.7 (165.9 - 167.6) Per 100,000

☐ Excluded, deaths <25 cases
☐ Significantly lower than state rate
☐ Lower rate but not significantly different from state rate
☐ Higher rate but not significantly different from state rate
☐ Statistically significantly higher than state rate
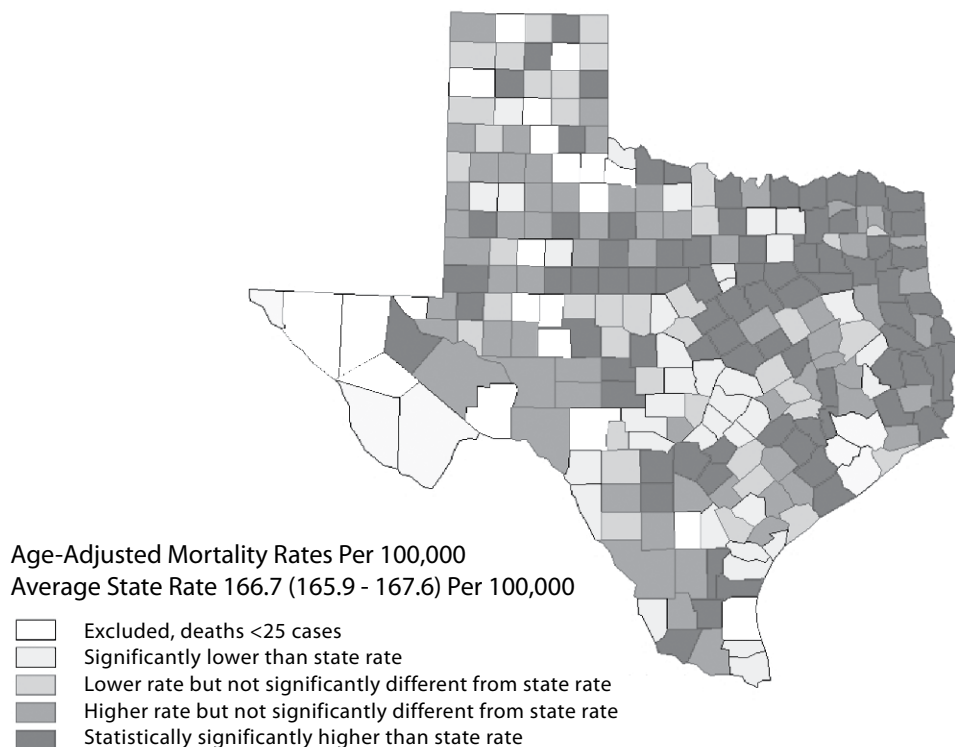
Data source: Texas Vital Statistics Unit, Center for Health Statistics, DSHS, 2005

Figure 7

Five Year Average Age-Adjusted Mortality Rates for Stroke, Texas, 2001-2005

Age-Adjusted Mortality Rates Per 100,000
Average State Rate 58.8 (58.3 - 59.4) Per 100,000

☐ Excluded, deaths <25 cases
☐ Significantly lower than state rate
☐ Lower rate but not statistically significantly different from state rate
☐ Higher rate but not statistically different from state rate
☐ Statistically significantly higher than state rate
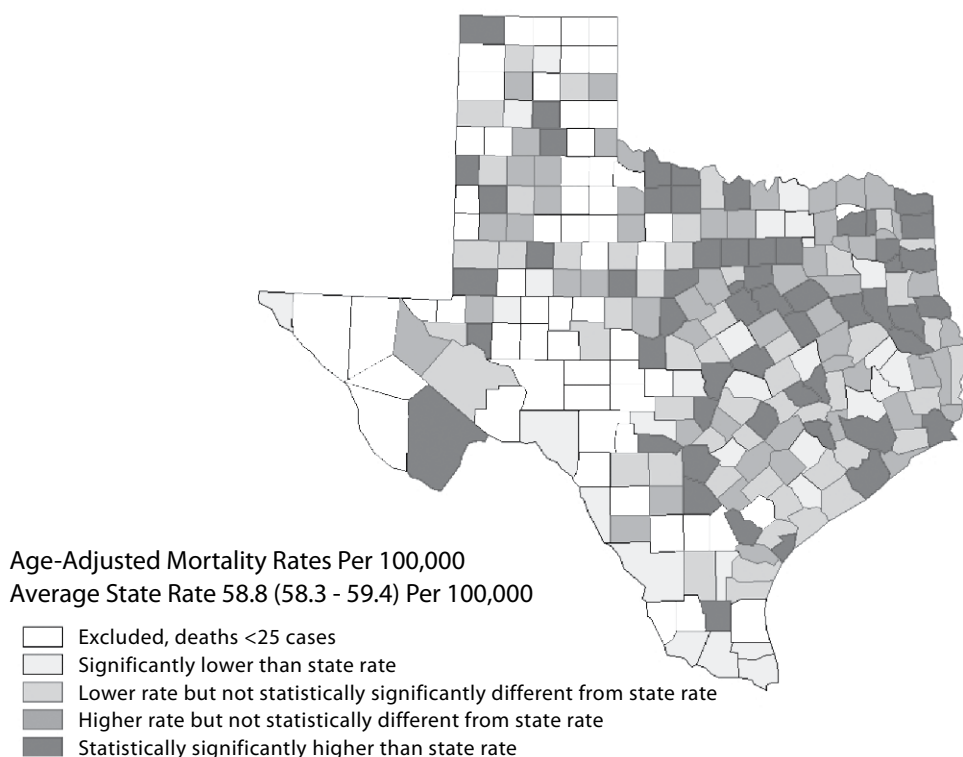
Data source: Texas Vital Statistics Unit, Center for Health Statistics, DSHS, 2005

Uninsured/ Underinsured

Lack of health care coverage and the high cost of health care are barriers to the prevention and treatment of CVD and stroke. Texas ranks lowest among states in the US for percent of residents with health care coverage (2004-2006 3-year average) and has consistently had a higher rate of uninsured than the US (Figure 8). Among Texans 18 years and older with CVD or stroke in 2007, 18 percent stated they did not have any type of health care coverage, 25 percent could not see a doctor due to the cost, and 20 percent did not have a routine checkup within the past year.[3]

Figure 8

No Health Insurance, United States and Texas, 1995-2007
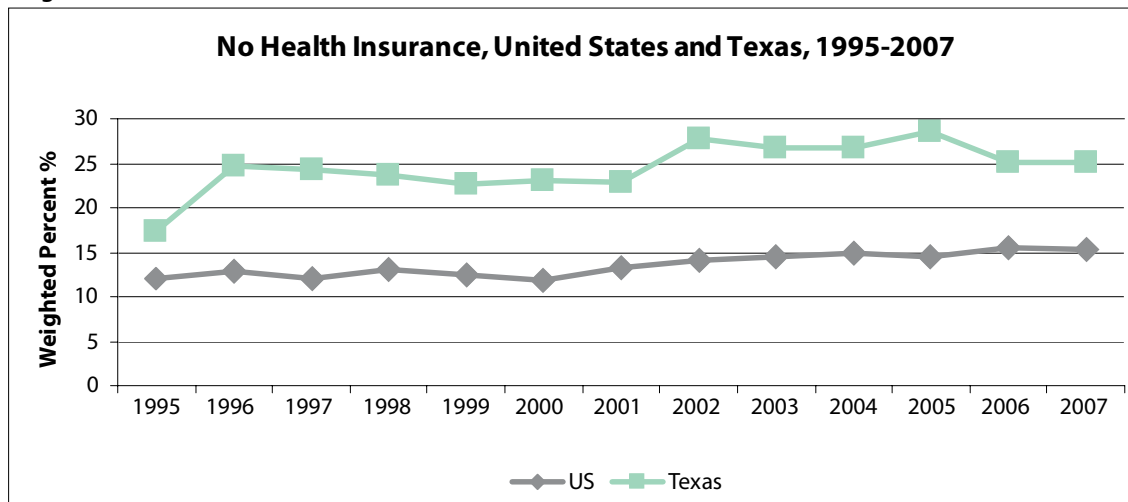
Data Source: BRFSS, Center For Health Statistics, DSHS, 2007

Improving access to care for high risk populations and the uninsured should be a priority for all programs working to prevent or treat cardiovascular disease and stroke and their related risk factors.

Risk Factors for Cardiovascular Disease and Stroke

Major epidemiologic studies dating from the 1960s have identified several major risk factors for cardiovascular disease. Many of these risk factors are modifiable through primary prevention measures like healthy eating, regular physical activity, maintaining a healthy weight, and avoiding tobacco use and exposure. Others are modifiable through secondary prevention measures such as treating and controlling high blood pressure, high cholesterol, and diabetes; weight loss in overweight and obese individuals; and tobacco cessation for smokers.

An examination of the trends in modifiable risk factors in Texas over the past 12 years demonstrates an increase in the prevalence of high cholesterol, obesity, diabetes, and high blood pressure. Rates of individuals getting no leisure time physical activity have remained relatively level and smoking rates have decreased since 1995, although 2007 data show a disturbing increase in the number of adults who smoke (Figure 9).

Figure 9

Risk Factors for CVD and Stroke, Texas, 1995-2007
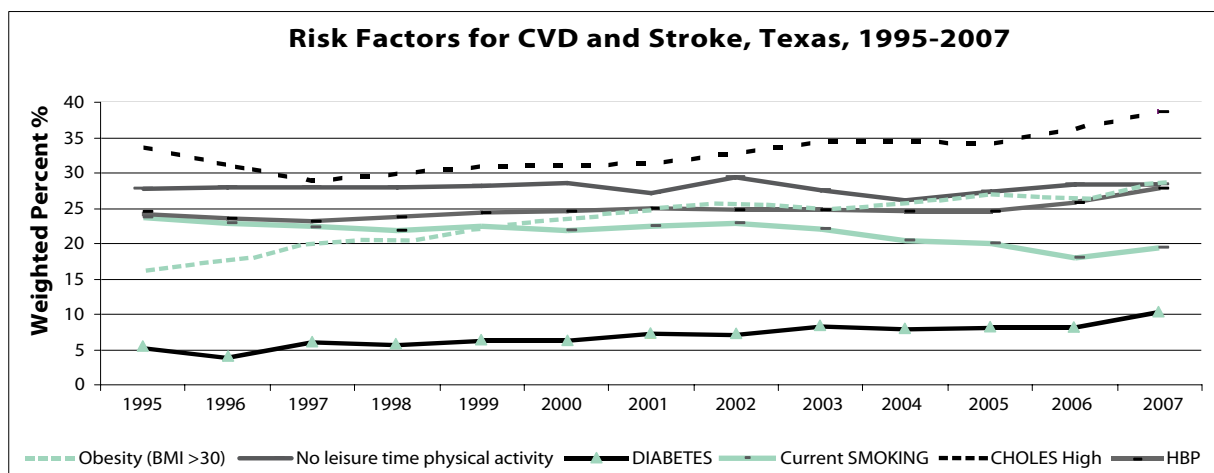
Data source: BRFSS, Center for Health Statistics, DSHS

High Blood Pressure

High blood pressure, also known as hypertension, is the most common primary diagnosis in America, affecting over 65 million people.[11] More than 27.8 percent of Texas adults have been diagnosed with high blood pressure.[3] Hypertension occurs in more than half of individuals 65 and older. As the population ages, the prevalence of high blood pressure will increase unless broad and effective preventive measures are implemented.[11]

High blood pressure is costly, accounting for more doctor visits than any other condition. The total annual estimated direct and indirect cost of high blood pressure to the US economy for 2008 is more than $69 billion.[2] In Texas in 2006, hospital charges for high blood pressure exceeded $739 million.[5]

The relationship between blood pressure and risk for cardiovascular disease is well established and independent of other risk factors. High blood pressure is a factor in 67 percent of heart attacks, 77 percent of strokes, and 74 percent of heart failures.[12] The higher the blood pressure, the greater the risk for heart attack and heart failure. The presence of prehypertension signals the need for increased education and lifestyle changes to prevent or reduce the onset of hypertension (Figure 10).[11]

Identifiable causes of high blood pressure include sleep apnea, drug induced or related causes, chronic kidney disease, primary aldosteronism, renovascular disease, chronic steroid therapy and Cushing's syndrome, pheochromocytoma, coarctation of the aorta, and thyroid or parathyroid disease. Obesity is an increasingly prevalent risk factor for the development of hypertension.[11]

Adoption of healthy lifestyles is critical for the prevention of high blood pressure and is an indispensible part of the management of those with hypertension. Recommended lifestyle changes include weight reduction, adoption of the Dietary Approaches to Stop Hypertension (DASH) eating plan, sodium reduction, physical activity, and moderation of alcohol consumption. Combinations of lifestyle modifications can achieve optimum results.[11]

In many cases, lifestyle modifications alone are not enough to control high blood pressure. Antihypertensive therapy is often necessary, frequently using two or more drugs. Antihypertensive therapy has been associated not only with excellent results in controlling high blood pressure, but with reductions in the incidence of stroke, heart attack, and heart failure. Lifestyle modifications can enhance the effects of drug therapy and contribute to lower cardiovascular risk.[11]

In 2006, Texas hospital charges for high blood pressure exceeded $739 million.

The prevalence, severity, and impact of hypertension are increased in African Americans, who demonstrate somewhat reduced responses to treatment with one antihypertensive drug. Drug combinations can eliminate these differential responses.[11]

Even the most effective therapy will fail to control hypertension if the patient is not motivated to adhere to prescribed medication regimens and adopt healthy lifestyle changes. It is important for clinicians to understand cultural differences, individual beliefs, and socioeconomic barriers to following recommendations and to use a patient-centered strategy to achieve agreed-upon goals.[11]

Secondary prevention of high blood pressure is a priority in the 2008 *Plan* and will be a major focus for the Cardiovascular Health and Wellness Program and the Texas Heart Disease and Stroke Prevention System Partnership.
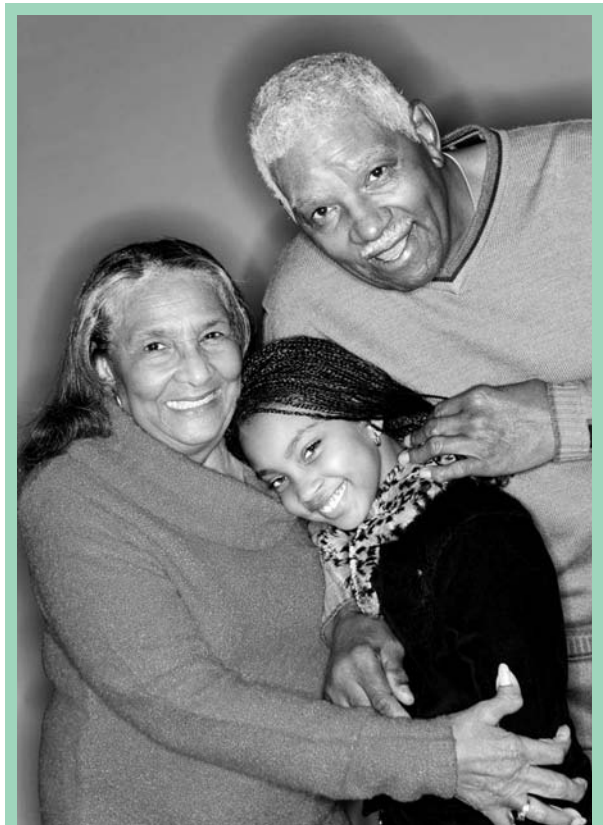
The prevalence, severity, and impact of hypertension are increased in African Americans .

Figure 10

Blood Pressure Classification and Treatment Recommendations				
Blood Pressure Classification	**Systolic**	**Diastolic**	**Lifestyle Modification**	**Drug Therapy**
Normal	< 120	And < 80	Encourage	No
Prehypertension	120-139	Or 80-89	Yes	No - unless compelling indications (i.e. diabetes or kidney disease)
Stage 1 Hypertension	140-159	Or 90-99	Yes	Yes
Stage 2 Hypertension	≥ 160	Or ≥ 100	Yes	Yes

Adapted from The 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, DHHS, 2003

High Blood Cholesterol

In 2007 more than 38 percent of Texas adults were diagnosed with high blood cholesterol, a major risk factor for heart disease.[3] Research indicates that elevated low density lipoprotein (LDL) cholesterol, low high density lipoprotein (HDL) cholesterol, and elevated triglycerides are each independent risk factors for coronary heart disease (CHD).[13]

Current guidelines from the National Cholesterol Education Program (NCEP) recommend a fasting lipoprotein profile (total cholesterol, LDL, HDL, and triglyceride) be measured every five years in adults 20 years and older. Adherence to screening guidelines by health care providers and making patients aware of their cholesterol levels are critical components of campaigns to reduce high cholesterol (Figure 11).[13]

Figure 11

Classification of LDL, Total, and HDL Cholesterol (mg/dL)	
LDL Cholesterol	**Classification**
< 100	Optimal
100-129	Near optimal/above optimal
130-159	Borderline high
160-189	High
≥ 190	Very high
Total Cholesterol	
< 200	Desirable
200-239	Borderline high
≥ 240	High
HDL Cholesterol	
< 40	Low
≥ 60	High

Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults, 2001

Reducing risk associated with high blood cholesterol involves reducing lifestyle risk factors such as obesity, physical inactivity, a diet high in saturated fats, excess alcohol consumption, and tobacco use. A diet high in carbohydrates (more than 60 percent of energy intake), certain diseases, certain drugs, and genetic causes are also associated with abnormal lipoprotein levels.[13]

In addition to therapeutic lifestyle changes, medication therapy may be indicated. LDL-lowering therapy has been shown to be very effective in reducing risk for CHD.

Lowering triglyceride levels and increasing HDL also involve therapeutic lifestyle changes and, when necessary, medication therapy targeting LDL.[13]

Adherence to NCEP guidelines by both patients and providers is key to achieving success in managing cholesterol levels and reducing risk for CHD. The NCEP Expert Panel recommends the use of multi-disciplinary methods involving the patient, providers, and the health care delivery system to achieve population level effectiveness for primary and secondary prevention.[13]

Diabetes, a major risk factor for cardiovascular disease, is a group of diseases marked by high levels of blood glucose and includes type 1, type 2, gestational, and other types resulting from specific genetic conditions. People with type 1 diabetes must monitor and control their blood glucose level by self administration of insulin. Those with type 2 diabetes can often control their blood glucose through diet, exercise, and oral medication. Diabetes self-management education is integral to effective medical care.[14]

It is estimated that almost 21 million people in the United States have diabetes, 6.2 million of whom are still undiagnosed.

It is estimated that almost 21 million people in the United States have diabetes, 6.2 million of whom are still undiagnosed.[14] The prevalence of diabetes (types 1 and 2) in Texas has increased over the past decade from 5.2 percent of adults in 1995 to 10.4 percent in 2007.[3] African Americans (12.9 percent) and Hispanics (12.3 percent) in Texas had a significantly higher prevalence of diabetes, compared to Whites (8.5 percent) in 2007. As the Hispanic population in Texas continues to increase, it is estimated that by 2040, Hispanics will comprise the majority of diabetes cases.[15] Diabetes prevalence increases significantly with age, increasing sharply in the population 45 years of age and older.

Adults with diabetes have heart disease and stroke at rates two to four times higher than adults without diabetes. Heart disease and stroke account for approximately 65 percent of deaths nationally in people with diabetes.[14] The Multiple Risk Factor Intervention Trial demonstrated a three fold risk of death from CVD in men with diabetes independent of age, race, income, blood pressure, cholesterol, and tobacco use.[16]

According to the American Diabetes Association, it is important for patients and their providers to "make the link" between diabetes, heart disease, and stroke.[17] Diabetes management involves not only control of blood glucose but also of blood pressure and cholesterol levels. Between 2003 and 2006, less than 60 percent of US adults ages 40 and older with diabetes had their blood cholesterol and blood pressure controlled to recommended levels. There were no statistically significant differences among racial/ethnic groups.[18]

The Texas Diabetes Council (TDC), established by the Texas legislature, is charged with developing and implementing a state plan for diabetes treatment, education, and training. To fulfill this charge, the TDC conducts a biennial strategic planning session to identify priorities and goals for addressing diabetes in Texas. *The Texas Diabetes Plan* identifies priorities which encompass: advancing public policy, improving routine care and preventing complications, promoting professional education, increasing public awareness, promoting community outreach, and monitoring and evaluating data. The Diabetes Program at the Texas Department of State Health Services (DSHS) undertakes and sponsors a number of key activities that support the priorities of the *Diabetes Plan*.[15]

Tobacco Use and Exposure to Second Hand Smoke

Tobacco remains the single most preventable cause of death and disease in the United States today. Tobacco use is a major risk factor for heart disease and stroke. Between 1997 and 2001, smoking resulted in an estimated annual average of 137,979 deaths in the US from cardiovascular disease. In 1998, smoking-related health care expenditures in the US were estimated at $75.5 billion.[19]

After a steady decline in adult smokers since 1995, the adult smoking rate in Texas increased between 2006 and 2007 from 17.9 percent to 19.3 percent.[3] The Texas high school smoking rate in 2007 (that is smoked cigarettes on one or more days during the past 30 days) was 21.1 percent compared to the Healthy People (HP) 2010 goal of 16 percent.[20]

Epidemiologic studies have demonstrated that exposure to second-hand smoke is causally associated with coronary heart disease. Meta-analyses estimate that involuntary exposure to smoking increases the risk of heart attack by 25-35 percent.[21] Many Texas communities are working to adopt or have already passed smoke-free ordinances that reduce exposure to second-hand smoke in public places, including bars and restaurants. Still, 75 percent of Texans are not protected by strong smoke-free ordinances that cover municipal workplaces, private workplaces, restaurants, bars in restaurants, and bars not in restaurants.[22]

Tobacco-related health disparities are reflected in unequal treatment of tobacco use, incidence, morbidity, mortality, burden of illness, and access to resources. Racial/ethnic minorities, people with low socioeconomic status, and people with lower levels of education are at higher risk for tobacco use and exposure to second hand smoke, and they experience more tobacco related illness and death.[22] In Texas, we see the highest rates of smoking among young adults between 18 and 29 (24.3 percent), males (21.9 percent), Whites (20.5 percent) and African Americans (21.4 percent).[3]

Partners from across the state . . . are actively working to reduce tobacco use in Texas.

The Texas Cancer Council, now the Cancer Prevention and Research Institute of Texas, a state agency charged with implementing the *Texas Cancer Plan*, published the *Texas Tobacco Control Plan 2008, A Statewide Action Plan for Tobacco Prevention and Control in Texas (Tobacco Plan)*. Partners from across the state, including the Tobacco Prevention and Control Program at the DSHS; the American Cancer Society, High Plains Division; and many community level stakeholders are actively working to reduce tobacco use in Texas.

Investments in state-level, evidence-based prevention programs have produced significant reductions in cigarette consumption, demonstrating the need for fully funded state-wide tobacco prevention programs at levels recommended by the CDC. According to the *Tobacco Plan*, the most significant barrier to tobacco prevention and control in Texas is the lack of funding to implement these evidence-based programs. Currently, less than 1 percent of the 25 year estimate of $17.5 billion in Texas tobacco settlement funds has been invested in comprehensive community level programs.[22]

Overweight and Obesity

The prevalence of overweight and obesity has risen sharply since the mid-seventies. From 1995 to 2007, the percentage of adult Texans who were overweight or obese increased from 48.2 percent to 65.7 percent. Males (71.5 percent) had significantly higher rates of overweight and obesity than females (59.8 percent). Among racial/ethnic groups, African Americans (75.3 percent) and Hispanics (71.4 percent) had the highest rates of obesity and overweight compared to Whites (62.9 percent). Persons ages 45-64 are significantly more overweight or obese (71 percent) than those 18-29 (56.9 percent), 30-44 (66.4 percent), or older than 65 (64.3 percent).[3]

Overweight and obesity classifications are determined by body mass index (BMI), a ratio of body weight (kg) to height (m)^2.

Overweight is defined, in adults, as a BMI between 25 and 29.9.

Obesity in adults is defined as a BMI of 30 or higher.

A survey of Texas high school students conducted in 2007 found 15.6 percent of students were overweight (at or above the 85th percentile for body mass index[23]) and 19.9 percent of males and 11.6 percent of females were obese (at or above the 95th percentile for body mass index[23]). Hispanic students, followed by African American students, had higher rates of overweight than Whites at 19.5 percent, 17.1 percent, and 13.3 percent respectively.[20]

Premature death, heart disease, diabetes, cancer, respiratory problems, arthritis, and reproductive complications are among the health consequences of overweight and obesity. The incidence of heart disease, high blood pressure, and high cholesterol are higher in people who are overweight and obese. Risk factors for heart disease such as high cholesterol and high blood pressure are more prevalent in children and adolescents who are overweight.[24]

Recent studies suggest that obesity, independent of other risk factors such as keeping active and not smoking, increases risk for acute coronary syndrome (symptoms associated with myocardial ischemia).[25] Weight loss as modest as 5-15 percent of total body weight in a person who is overweight or obese can have significant benefits in reducing risk for heart disease.[24]

According to an economic model developed by Finkelstein, Fiebelkorn, and Wang (2004), annual US obesity attributable medical expenditures were estimated at $75 billion in 2003, approximately half financed by Medicaid and Medicare. Obesity-attributed medical expenditures for adults in Texas in 2003 were estimated at over $5 billion.[26]

The Surgeon General's *Call to Action to Prevent and Decrease Overweight and Obesity* identifies, as a national priority for immediate action, the need for the nation to take an informed, sensitive approach to communicate with and educate the American people about health issues related to overweight and obesity.[24] A sustained and effective public health response is needed that includes surveillance, research, policies and programs directed at improving environmental factors, increasing awareness, and changing behaviors to increase physical activity and decrease calorie intake.[27]

The Nutrition, Physical Activity, and Obesity Prevention Program at DSHS has worked with partners from across the state to produce *Updates for the Strategic Plan for the Prevention of Obesity in Texas 2008 (Update)*. The *Update* is intended to provide direction and focus as Texans move forward with implementation of the *Strategic Plan for the Prevention of Obesity in Texas: 2005-2010 (Obesity Plan)*. The *Update* identifies 19 key targets from the *Obesity Plan* and 55 indicators that will be used to track progress as partners across Texas work to address obesity as a public health issue, create opportunities to choose lifestyles that promote healthy weight, implement policies and environmental changes that support healthful eating and physical activity, and decrease obesity rates through the dissemination of evidence-based practices.[28]

Unhealthy Eating

Nutrition plays an important role in an individual's overall health and quality of life. A diet high in calories, saturated fat, and cholesterol and high in sodium or sugar is a major contributor to poor health. Sources for dietary guidelines include the Food and Nutrition Board of the National Academies, Institute of Medicine; the American Heart Association; the National Cholesterol Education Program; and the American Diabetes Association. Each organization's guidelines are slightly different; however, they are compatible, recognizing that each is designed with a particular population and specific health objectives in mind.[29]

For reducing risk of CVD and stroke, the American Heart Association encourages people to know their daily caloric intake to help ensure calories eaten do not exceed calories burned through daily physical activity and consume nutrient rich foods that are high in vitamins, minerals, fiber, and other nutrients but low in calories (Figure 12).[30]

The 2008 *Plan* focuses on two of the CDC's Healthy People 2010 objectives for improving nutrition related to cardiovascular disease and stroke: fruit and vegetable consumption and sodium intake.

A diet high in fruits and vegetables is associated with better weight management and a reduced risk of chronic disease.[31]

Figure 12

Americans are encouraged to eat a variety of foods, including:
• Plenty of vegetables and fruits,
• Unrefined whole grains and legumes,
• Low fat dairy products,
• Lean meats, poultry, and fish, including oily fish high in omega-3 fatty acids; and
• Small amounts of salt, sugar, saturated fats, trans fats, and cholesterol.[30]

Texas adults do not meet the recommendation to eat fruits and vegetables at least five times per day. In 2007, 74.8 percent of adult Texans reported eating fruits and vegetables fewer than five times per day. Males had a slightly higher rate of low fruit and vegetable consumption (77.8 percent) than females (71.9 percent). There were no statistically significant differences among racial/ethnic groups.[3]

Poor eating habits are often established during childhood. Only 17.4 percent of Texas high school students in 2007 reported eating five or more servings of fruits and vegetables per day. There were no statistically significant differences among racial/ethnic groups.[20]

Evidence from animal studies suggests that early nutrition (from the moment of birth) can influence cardiovascular health. There is now strong evidence in human studies that breast feeding has a beneficial effect on the major components of metabolic syndrome (obesity, blood pressure, cholesterol metabolism, and insulin resistance). Breast feeding is therefore an evidence-based, preventive strategy with large potential benefits for public health. Further research is needed to confirm the effectiveness of breast feeding in reducing the prevalence of cardiovascular disease.[32]

There is now strong evidence in human studies that breast feeding has a beneficial effect on the major components of metabolic syndrome (obesity, blood pressure, cholesterol metabolism, and insulin resistance).

Dietary sodium reduction is a cornerstone in managing high blood pressure. Studies in diverse populations show that salt intake is linked to increased levels of blood pressure.[33] Sodium intake of no more than 2,400 mg per day is recommended by most authorities. A popular, evidence-based approach to reducing hypertension is the Dietary Approaches to Stop Hypertension (DASH) eating plan. A 1,600 mg sodium DASH eating plan has effects similar to single drug therapy for treating high blood pressure.[11] Reducing the amount of sodium in manufactured/packaged and restaurant prepared foods has become a national initiative to reduce daily intake of sodium by Americans.

To meet national and state objectives for good nutrition, the CDC recommends a public health approach that includes continued surveillance, identification of barriers to healthy eating, and policy and environmental change. Interventions that increase public awareness, effectively motivate individual behavior change, and increase access to affordable, healthy foods should be promoted. Such programs include counseling by health care providers, school-based initiatives, faith-based and culturally appropriate programs, and access to community gardens and farmer's markets.[31]

Regular physical activity is associated with reduced risk for chronic disease and a healthier, longer life. Cardiovascular benefits of regular physical activity include lower risk for heart disease, high blood pressure, stroke, abnormal blood cholesterol and triglycerides, type 2 diabetes, obesity and a second heart attack.[34]

Despite the benefits, most Texans, like most Americans, are sedentary. In 2007, the proportion of Texas adults who reported no participation in physical activity (28.3 percent) was higher than the national average (24.0 percent). Females were less likely to participate in physical activity (31 percent) compared to males (25.5 percent). African Americans (33.7 percent) and Hispanics (34.3 percent) had higher rates of no physical activity than Whites (23.5 percent). Persons over 65 were significantly less likely to participate in physical activity (38.6 percent) than other age groups (23.2 to 29 percent).[3]

In 2007, too few Texas high school students reported being physically active for at least 60 minutes per day on five or more days during the past week (45.2 percent). Males were significantly more likely to be active (55.3 percent) than females (34.7 percent), while Hispanic students were significantly less likely (38.6 percent) compared to Whites (49 percent) and African Americans (53 percent).[20]

Moderate intensity activities can include: dancing, bike riding, scrubbing the floor, mowing the lawn , raking leaves, playing golf (walking the course), walking briskly, and actively playing with children.[34]

The CDC monitors indicators for chronic disease which include moderate or vigorous physical activity for adults and vigorous physical activity that results in sweating or breathing hard for 20 or more minutes per day on 3 or more days per week for youth.[35] Only 46.5 percent of adult Texans participated in moderate physical activity in 2007.[20]

The American College of Sports Medicine and the CDC recommend that every adult accumulate 30 minutes or more of moderate intensity physical activity on most, preferably all, days of the week. Even activity that is not strenuous or continuous can produce health results. Moderate intensity activities can include: dancing, bike riding, scrubbing the floor, mowing the lawn, raking leaves, playing golf (walking the course), walking briskly, and actively playing with children.[34]

The systems of care involved in the continuum of care for cardiovascular disease and stroke include the emergency health care system, which responds to emergencies and provides pre-hospital care; the health care system in preventing and treating disease; and the public health system, which takes a population approach to preventing disease, improving quality of care, increasing access to care, eliminating health disparities, and providing surveillance and reporting activities. Monitoring, tracking, and making improvements, where needed, within the systems of care in Texas are priorities in the 2008 *Plan*.

Texas policy makers, agency and organizational leaders, and community level practitioners need timely, accurate, and relevant data to better understand the issues and challenges Texas faces in reducing mortality and morbidity from heart attack and stroke.

Information and data needed to improve surveillance of cardiovascular disease and stroke in Texas include:
- the response of bystanders to a cardiac or stroke event.
- the timeliness and quality of care provided by emergency responders in the field and in the emergency department.
- the development and implementation of treatment guidelines and protocols.
- the quality and equity of long term care.

Emergency Health Care System *(Pre-hospital care)*

After a cardiac event, time until defibrillation is critical. For both a stroke event and a cardiac event, rapid diagnosis and treatment can mean the difference between recovery and disability or death. HP 2010 sets targets for increasing the proportion of persons who have access to rapidly responding prehospital emergency services. For urban areas, the targeted interval between a 911 call and arrival on the scene is less than 5 minutes for first responders and less than 8 minutes for transporting Emergency Medical Service (EMS). In rural areas, the targeted time interval between a call and arrival on the scene is less than 10 minutes.[33]

A 2007 survey of EMS services in 200 cities in America identified the need for improvements in the emergency health care system
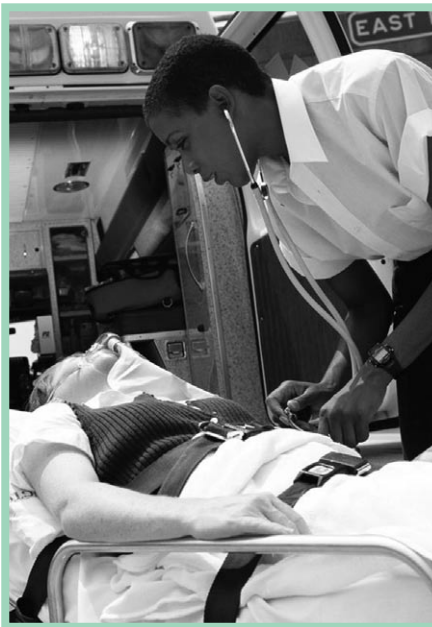
from the time a 911 call is placed until the patient is delivered to the hospital. Challenges include requirements that dispatchers be certified; use of emergency medical dispatch protocols; sending the nearest ambulance unhindered by jurisdictional or contractual boundaries; having qualified first responders able to use evidence-based medical protocols; and meeting response time expectations.[36]

In Texas, the average EMS response time for both a suspected cardiac event and a suspected stroke in 2003-2004 was approximately 8 minutes from the time the call was received to the time EMS arrived on the scene and nearly 40 minutes from the time the call was received to the time EMS arrived at destination, generally a hospital.[37]

Figure 13

**EMS Response Time in Minutes for CVD
Texas Residents, 2003 and 2004**
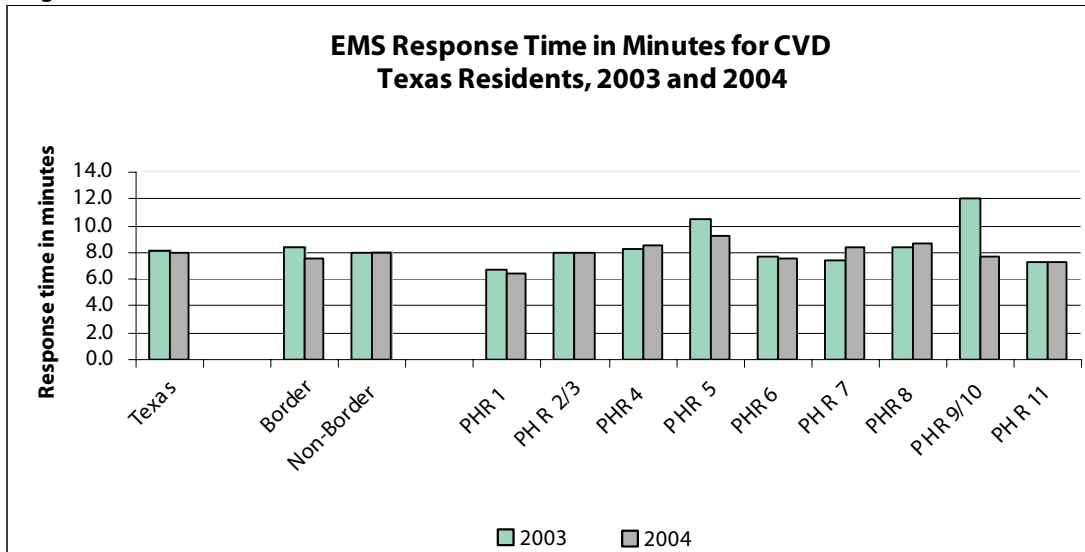
Data Source: Texas EMS/Trauma Registry, 2003, 2004

According to the Texas EMS/Trama Registry, response times in 2003 and 2004 varied across public health service regions (Figure 13). Some demonstrated significant improvement in response time between 2003 and 2004 while others did not. Numbers may be underestimations as the Texas EMS/Trauma Registry did not receive medical-related call data from all participating EMS providers in Texas.

Increasing the quality and reliability of stroke and cardiac event data reported to the Trauma Registry is an important system-wide objective in the 2008 *Plan*.

Health Care System *(Emergency Department care)*

The benefits of rapid identification and treatment of heart attack and stroke are clear. Early treatment of heart attack reduces heart muscle damage and early treatment of stroke can minimize functional disability. As therapies become increasingly more effective, rapid implementation of therapies has become critical to improving patient outcomes.[33] Developing and implementing clinical practice guidelines and protocols that reflect the highest standards of care and providing education and training for emergency department personnel are important strategies for improving patient outcomes.

The Stroke System of Care

Many areas of Texas are currently underserved with regard to stroke facilities that are able to effectively diagnose, treat, and manage stroke patients. An effort is underway to quantify the number and location of facilities in Texas that are able to provide acute stroke care, supportive care and transport, and comprehensive stroke care that includes rehabilitation and long term care.

The DSHS Cardiovascular Health and Wellness Program, in consultation with the DSHS Office of EMS, and in collaboration with the AHA and the American Stroke Association is developing Stroke Systems of Care, an initiative to improve timely care for patients, reduce the burden of stroke, and improve survival outcomes. DSHS is funded by the CDC to facilitate development of systems of care for heart disease and stroke.

Texas Framework For Heart Disease and Stroke

Vision of the Future

Improved Health	Improved Quality of Life

Environmental and Social Conditions Favorable to Health	Behavioral Patterns that Promote Health	Low Population Risk	Few Events/ Only Rare Deaths	Fully Functional Capacity/ Low Risk of Recurrence	Good Quality of Life Until Death

CDC Goals

Goal 1 Prevent Risk Factors	**Goal 2** Detect and Treat Risk Factors	**Goal 3** Early Detection and Treatment of Heart Attack and Stroke	**Goal 4** Prevent Recurrent Events

Texas State Stats

Behavioral Risk Factors	Estimated Cases (18+)	Prevalence Rates (18+)	Medical Risk Factors	Estimated Cases (18+)	Prevalence Rates (18+)	Disease	Estimated Cases (18+)	Prevalence Rates (18+)
Physical Inactivity (07)	949,000	28.3%	Total Cholesterol (07)	6,733,000	38.5%	Stroke (07)	490,000	2.8%
Smoking (07)	375,000	19.3%	HBP (07)	4,862,000	27.8%	Heart Disease (07)	1,172,000	6.7%
Poor Nutrition (07)	13,081,000	74.8%	Diabetes (07)	1,801,000	10.3%	CVD (07)	1,452,000	8.3%
			Overweight/Obesity (07)	11,490,000	65.7%			

Texas Adult (18+) Population - 17,188,130 (07)   **Mortality 2005** Age Adjusted Death Rate (per 100,000)   Stroke 52.1   IHD 151.8

Ten Essential Services

Essential Service #9: Research				Essential Service #10: Evaluation			
Essential Service #1: Surveillance and Data	Essential Service #2: Diagnose and Investigate	Essential Service #3: Educate and Inform	Essential Service #4: Partnerships	Essential Service #5: Policies	Essential Service #6: Enforcement	Essential Service #7: Link Services	Essential Service #8: Workforce

Strategies

Council Strategy 1 Data and Surveillance	**Council Strategy 2 -** Health Education and Outreach	**Council Strategy 3 -** Community Policy and Environmental Change	**Council Strategy 4 -** Clinical Prevention and Treatment

Texas Plan to Reduce Cardiovascular Disease and Stroke 2008 — 2012 Logic Model

PROCESSES

OUTCOMES

Inputs

- Texas Heart Disease and Stroke Prevention System Partnership
- Centers for Disease Control and Prevention
- Community Stakeholders
- Statewide Surveillance Systems
- Emergency Medical System Providers
- Health Care Providers
- Health Insurance Providers
- Media Partners
- Business Partners
- Public Officials

Activities

Further develop Texas Heart Disease and Stroke Prevention System Partnership

Improve surveillance of CVD/stroke and identify priority populations

Provide training, technical assistance and consultation for Partners and Stakeholders

Develop and implement Plans of Action around priority objectives identified by the Partnership as well as by other stakeholders

Identify CVD/Stroke initiatives taking place around Texas

Outputs

Partnership structure and processes amenable to taking action to implement the *Plan*

Texas CVD/Stroke Surveillance System with Burden Reports

Training/TA provided by experts to enhance Partnership effectiveness and build state and local capacity

Plans of Action with concrete action steps, commitments by partners, and deadlines

Database of CVD and stroke initiatives in Texas

Short Term

Increased collaboration and coordination among Texas CVD and stroke stakeholders

Improved surveillance of CVD and stroke morbidity and mortality and prevalence of risk factors

Increased capacity for Partnership and Texas stakeholders to implement the *Plan*

Implementation of *Plan* strategies using evidence-based programs and interventions by Texas stakeholders

Intermediate

Progress towards achieving **Goal 1: Prevention of Risk Factors** as evidenced by progress towards meeting identified targets for seven objectives.

Progress towards achieving **Goal 2: Detection and Treatment of Risk Factors** as evidenced by progress towards meeting identified targets for ten objectives.

Progress towards achieving **Goal 3: Early Detection and Treatment of Heart Attack and Stroke** as evidenced by progress towards meeting identified targets for six objectives.

Progress towards achieving **Goal 4: Prevention of Recurrent Events** as evidenced by progress towards meeting identified targets for four objectives.

Progress towards achieving **Goal 5: Improved State and Local Capacity** as evidenced by progress towards meeting identified targets for four objectives.

Long Term

Reduced premature deaths and morbidity due to Heart Disease and Stroke

The Governor's EMS and Trauma Advisory Council Stroke Committee has developed a Stroke Systems of Care Plan to be implemented by Regional Advisory Councils.

This plan recommends:

- Appointment of a stroke committee to develop and oversee a regional transport plan
- The regional plan will conform to a set of agreed upon guidelines
- A registry of stroke patients will be created and maintained

The Heart System of Care

Patients who receive artery-opening therapy within the first or second hour after the onset of heart attack symptoms experience significant reductions in disability and death.[33] A relatively new initiative, designed to decrease the time between the onset of a myocardial infarction and the delivery of treatment, targets patients experiencing an ST-elevation myocardial infarction or STEMI. In an analysis of 185,968 patients listed in the National Registry of Myocardial Infarction - 4, approximately 29 percent were diagnosed with STEMI. The use of guideline-recommended medications and interventions were found to be suboptimal in these patients.[38] A STEMI initiative called Mission: Lifeline, spearheaded by the AHA, focuses on increasing the number of patients with timely access to primary percutaneous coronary intervention (PCI). According to the AHA, up to 20 percent of STEMI patients are not eligible for fibrinolytic (clot busting) therapy and yet 70 percent of these patients do not receive PCI, the only reperfusion option.[39]

Guidelines for treating non ST-elevation myocardial infarction (NSTEMI), which occurs more frequently than STEMI, are also not routinely followed in all patients.[38] Several initiatives are underway to educate medical professionals and change systems of care to improve utilization of clinical practice guidelines for treating myocardial infarction patients.

Public Health System

In the fall of 2006, the Texas Heart Disease and Stroke Prevention System Partnership held a summit to assess the state's public health infrastructure based on the Ten Essential Public Health Services as they relate to the prevention and treatment of cardiovascular disease and stroke (Figure 14).

Figure 14

Ten Essential Public Health Services Related to Heart Disease and Stroke
1. Monitor health status to identify health problems related to heart disease and stroke.
2. Diagnose and investigate health problems and health hazards related to heart disease and stroke in the community.
3. Inform, educate, and empower people about heart disease and stroke issues.
4. Mobilize partnerships to identify and solve health problems for heart disease and stroke prevention.
5. Develop policies and plans that support individual and statewide health efforts for heart disease and stroke prevention.
6. Enforce laws and regulations that protect health and ensure safety related to heart disease and stroke.
7. Link people to needed personal health services for heart disease and stroke and assure the provision of health care when otherwise unavailable.
8. Assure a competent public health and personal health care workforce for heart disease and stroke.
9. Evaluate effectiveness, accessibility, and quality of personal and population based health services for heart disease and stroke.
10. Conduct research to attain new insights and innovative solutions to health problems related to heart disease and stroke.

In the spring of 2007, the Partnership held a second Summit to begin systems-planning around the Ten Essential Public Health Services. The resulting objectives and action items identified during these meetings have been incorporated into the 2008 *Plan*.

Over the years, DSHS has either funded or supported numerous statewide and community level initiatives to reduce cardiovascular disease and stroke. DSHS continues to address cardiovascular disease and stroke through the CDC-funded Cardiovascular Health and Wellness (CHW) Program, support for the Texas Council on Cardiovascular Disease and Stroke, and support for the Texas Heart Disease and Stroke Prevention System Partnership.

A systems approach that focuses on building capacity for state and local efforts to implement population based interventions has been and will continue to be a priority for the CHW Program. Monitoring cardiovascular disease and stroke, supporting collaboration among partners, coordinating available services and resources, seeking funding to expand reach and improve quality of care, connecting partners to evidence-based interventions, and working to reduce health care disparities are examples of population based strategies pursued by the CHW Program in collaboration with the statewide Partnership.

The 2008 *Plan* includes objectives related to increasing the capacity for state and local entities to implement the *Plan*, including creating a comprehensive emergency health care surveillance system and effective implementation of the Ten Essential Public Health Services as they relate to CVD and stroke.
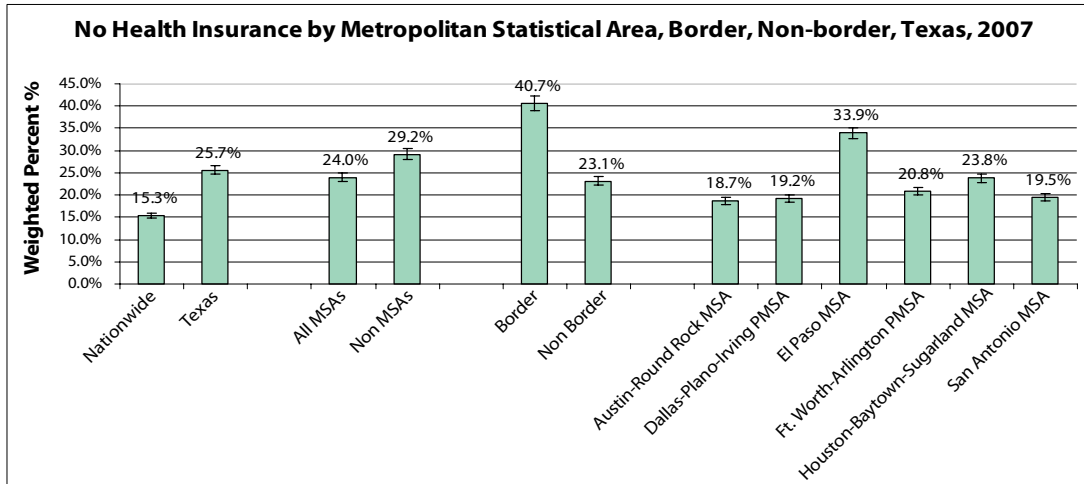
Although many Americans receive the health care they require, the approximately 41 million people without health insurance have difficulty accessing care and often go without needed services.[40]

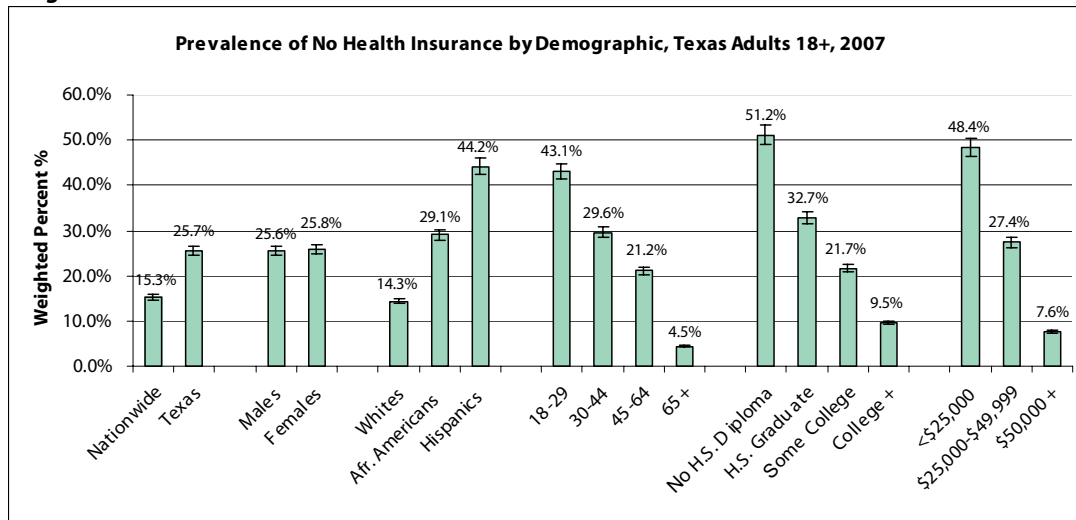Communities along the border and in East Texas have particularly high rates of unin-sured. Hispanics and African Americans are more likely to lack health care coverage than Whites. Younger Texas adults are more likely to be uninsured than older Texans. The lower the education level and annual income, the greater the likelihood of having no insur-ance (Figures 15 and 16).[3]

Figure 15

No Health Insurance by Metropolitan Statistical Area, Border, Non-border, Texas, 2007

Data source: BRFSS, Center for Health Statistics, DSHS, 2007

Figure 16

Prevalence of No Health Insurance by Demographic, Texas Adults 18+, 2007

Data source: BRFSS, Center For Health Statistics, DSHS, 2007

Secondary prevention of cardiovascular disease and stroke relies on the early detec-tion and management of risk factors such as high blood pressure, high blood cho-lesterol, diabetes, and obesity. Not having routine primary health care is a barrier to secondary prevention. In 2007, Texas had significantly higher rates of adults who had not had a routine health check-up within the past year compared to the national av-erage (Figure 17).[3]

Figure 17

Percentage of No Routine Health Checkup within Past Year
### Texas Adults 18+, 2007
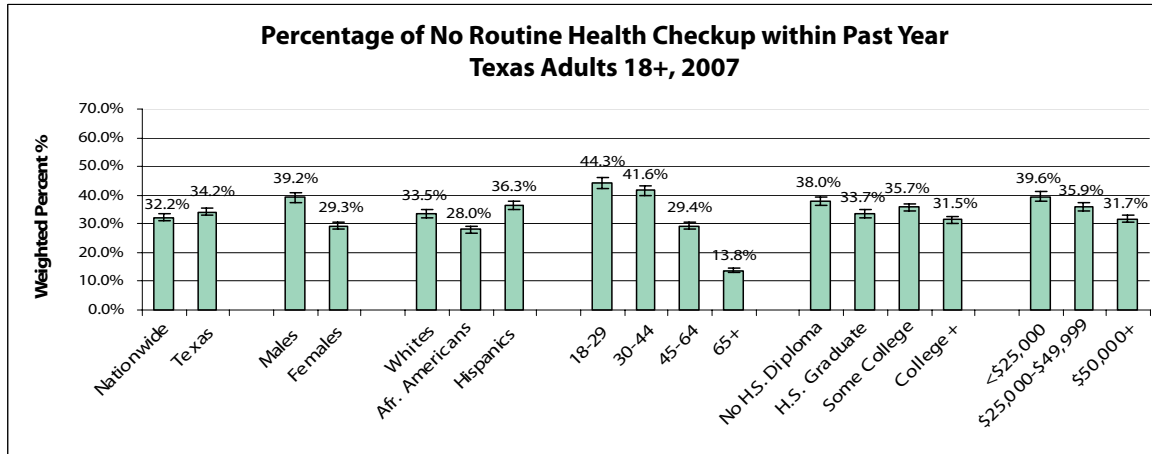
Data source: BRFSS, Center For Health Statistics, DSHS, 2007

Cost is often a barrier to routine health care, even for those with insurance. Texas had a significantly higher rate of adults who could not see a doctor in 2007 due to cost compared to the national average. Significantly higher rates of females, Hispanics, African Americans, and young adults could not see a doctor in 2007 due to cost compared to males, Whites, and those over 65 (Figure 18).[3]

Figure 18

Prevalence of Could Not See a Doctor Because of Cost
Texas Adults 18+, 2007
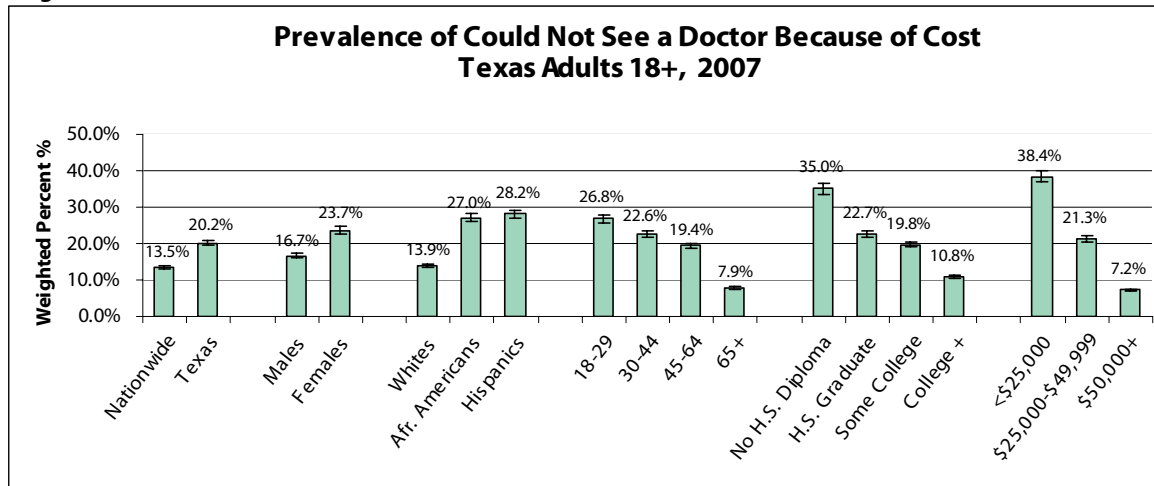
Data source: BRFSS, Center For Health Statistics, DSHS, 2007

Access to long term care, including nursing home care, home health care, adult day care, assisted living, and hospice care is a critical and growing concern for all Americans as the elderly population continues to rise. Victims of both cardiac events and strokes often require post-hospital rehabilitation and stroke victims left with disabilities require the long-term help of others to perform activities of daily living as well as meet routine needs. Financial barriers and limited availability of services restrict access to these services for many.

Addressing access to health care for all Texans will require system-wide, policy-level change. Texans will need to be vigilant in making their voices heard as national and state policymakers work to address what has become a national priority.

Addressing Health Disparities

Addressing disparities related to cardio-vascular disease, stroke, and related risk factors must be a priority for all stakeholders. The 2008 *Plan* does not set a specific goal or objective related to any particular priority population, rather, reducing disparities is a critical factor within every goal and objective. The development and implementation of culturally-competent, evidence-based programs that effectively reach disparate populations continues to be a critical need and should be paramount as stakeholders work to implement the strategies identified in the *Plan*.

Framework for Action

The Texas Framework for Heart Disease and Stroke (Centerfold), modeled after the CDC's Action Framework for a Comprehensive Public Health Strategy[1], outlines a comprehensive strategy for the *Plan*. This framework addresses the four Healthy People 2010 goals specific to heart disease and stroke.

As the framework suggests, when six broad intervention approaches (social and environmental conditions favorable to health, behavioral patterns that promote health, low population risk, few events and rare deaths, fully functional capacity/low risk of recurrence, and good quality of life until death) are fully and effectively implemented, our vision for a heart healthy, stroke free Texas can be realized.

The framework also demonstrates how the Texas Council for Cardiovascular Disease and Stroke's four strategy areas of data and surveillance, health education and outreach, community policy and environmental change, and clinical prevention and treatment, combined with a focus on the Ten Essential Public Health Services, provide a basis for improving public health capacity and addressing priority areas in cardiovascular disease and stroke prevention, detection and treatment.

The *Texas Plan to Reduce Cardiovascular Disease and Stroke* (*Plan*) identifies a set of goals and objectives, and proposes evidence-based, best practice, or promising strategies for making progress in meeting these objectives. Some strategies are cross-cutting, serving to address more than one objective. Many of the objectives are taken directly from the national Healthy People 2010 objectives for improving the health of the nation. Progress in meeting these objectives can be measured using established health indicators and existing data collection sources.

In some cases, such as in Goal V, the objectives are related to improving the systems of care in Texas and building capacity for local and statewide cardiovascular and brain health efforts. These objectives are not measurable using established health indicators. It will be important for stakeholders taking action in these areas to identify, early on, indicators for monitoring and reporting success.

For many strategies, there may be specific evidence-based or best practice programs or interventions in existence. See Appendix I for a list of existing, evidence-based or promising programs/resources. Stakeholders are encouraged to seek and use evidence-based programs when they exist and, when they don't, to develop new interventions using theory-based approaches and sound evaluation techniques. Too often resources are wasted on duplicative efforts or on funding initiatives that have not been proven to work and that have no evaluation component to demonstrate effectiveness.

Stakeholders in Texas should be able to identify where their efforts fit within this *Plan*. Individuals and organizations will determine how their vision and mission plays a part in implementing the *Plan* and will identify, individually or collectively, what actions they are taking or will take to implement identified strategies. Partners working to implement the *Plan* may conduct action planning around the implementation of one or more strategies which, when completed, will help to achieve short term objectives and longer term goals. By working together, stakeholders in Texas can make progress and, ultimately, reduce premature death and improve quality of life for Texans with heart disease and stroke.

Goal:
A statement of a long term expected outcome.

Objective:
A shorter term, measurable change that, when accomplished, will help in reaching the goal.

Strategy:
A relatively broad approach to achieving an objective.

Goal I. Texans will experience improved cardiovascular health and quality of life through the Prevention of Risk Factors

Objective 1: Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day (HP 2010).
   Strategies:
   • Implement community-wide campaigns [SE]
   • Implement individually adapted health behavior change programs [SE]
   • Create/enhance access to places for physical activity such as parks, trails, bike lanes, and sidewalks combined with information outreach [SE]

Objective 2: Increase the proportion of youth grades 9-12 who have been physically active for a total of 60 minutes per day on 5 or more days per week (HP 2010).
  Strategies:
  - Implement school-based physical education [SE], clearly define physical education requirements for schools, and enforce existing legislation concerning physical education requirements
  - Improve/implement community wide campaigns [SE]
  - Develop collaborations among community partners working to increase youth physical activity levels (non-family social support) [SE]

Objective 3: Reduce the proportion of adults who engage in no leisure-time physical activity (HP 2010).
  Strategies:
  - Implement community-wide campaigns [SE]
  - Implement individually adapted health behavior change programs [SE]
  - Create/enhance access to places for physical activity combined with information outreach [SE]

Objective 4: Increase the proportion of adults 18 and older who report eating fruits and vegetables five or more times per day (HP 2010).
  Strategies:
  - Enhance access to healthy foods and reduce access to unhealthy foods at worksites and in community settings [EUR]
  - Provide information about produce that includes price and easy preparation ideas [IE]

Objective 5: Increase the proportion of youth grades 9-12 who report eating fruits and veg-etables five or more times per day (HP 2010).
  Strategies:
  - Enhance access to healthy foods and reduce access to unhealthy foods in school-based settings [EUR]
  - Encourage eligible youth to participate in the National School Lunch Program [SE-USDA]
  - Implement recognition programs for schools meeting standards [IE]

Objective 6: Reduce the proportion of youth grades 9-12 who report using any type of tobacco on one or more days in the past 30 days (HP 2010).
  Strategies:
  - Promote the use of comprehensive, evidence-based tobacco control programs that include educational, clinical, regulatory, economic, and social strategies [SE]
  - Use peer-involved campaigns [SS]
  - Work with partners in tobacco control to develop a tobacco prevention and control toolkit [IE]
  - Seek full funding for statewide tobacco prevention and control [R]

Objective 7: Reduce exposure to second hand smoke (HP 2010).
  Strategies:
  - Promote legislative action, city/state wide ordinances, and community policies for smoke-free public spaces, including worksites [SE]
  - More actively enforce tobacco ordinances [SE]
  - Develop grass roots coalitions to work on smoke-free ordinances utilizing smokefreetexas.org to centralize advocacy efforts [R]

Goal II: Texans will experience improved cardiovascular health and quality of life through the Detection and Treatment of Risk Factors

Objective 1: Reduce the proportion of adults 18 and older with high blood pressure (HP 2010).
    Strategies:
- Increase the number of worksites that have evidence-based or best practice wellness programs, policies, and environmental supports that contribute to the reduction of high blood pressure and other risk factors related to heart disease and stroke [EUR]
- Implement community level programs promoting healthy eating, physical activity, smoking cessation, and healthy weight [SS]
- Work to decrease sodium content in restaurant and manufactured foods [SS]

Objective 2: Increase the proportion of adults with high blood pressure whose blood pressure is under control (HP 2010).
    Strategies:
- Promote implementation of screening guidelines by health care professionals for the early detection and treatment of high blood pressure [SE]
- Promote the availability of health plans that cover/include appropriate screenings and incentives to identify, reduce and treat high blood pressure [SS]
- Encourage health care practices to use team-based care that includes a multidisciplinary team of health care professionals [SS]
- Promote health care system level solutions that use practitioner and patient reminders and medical records flags [R]
- Work with third party payers to reimburse for high blood pressure management [SS]
- Increase access to primary health care and affordable medications for underserved populations [R]

Objective 3: Increase the proportion of adults with high blood pressure who are taking at least two actions (for example: losing weight, participating in physical activity, reducing sodium intake, taking medications as prescribed) (HP 2010).
    Strategies:
- Implement community outreach and worksite programs promoting healthy eating (for example the DASH eating plan), physical activity, smoking cessation, and healthy weight [SS]
- Increase access to affordable prescribed medications for uninsured and underinsured [R]
- Identify, disseminate, and promote utilization of evidence-based guidelines for hypertension identification, treatment, and management [R]

Objective 4: Increase the proportion of adults who have had their blood cholesterol checked within the preceding 5 years (HP 2010).
    Strategies:
- Promote implementation of screening guidelines by health care professionals for the early detection and treatment of lipid disorders [R]
- Include screening for total lipid panel in worksite wellness programs [IE]
- Encourage provision of incentives for routine physical exams that include cholesterol screening [IE]
- Explore having health screenings as part of new hire policies [IE]

Objective 5: Reduce the proportion of adults with high total blood cholesterol levels (HP 2010).
   Strategies:
   • Implement community outreach programs promoting healthy eating and physical activity [SE]
   • Promote the availability of health plans that cover/include appropriate screenings and incentives to identify, reduce and treat lipid disorders [SS]
   • Increase the number of worksites that have evidence-based wellness programs, policies, and environmental supports that contribute to the reduction of high cholesterol, and other risk factors related to heart disease and stroke [EUR]

Objective 6: Reduce the proportion of adults who report a BMI (height and weight self-report) greater than 25 Kg/m^2 (HP 2010).
   Strategies:
   • Implement multi-component interventions aimed at diet, physical activity, and cognitive change at worksites and in other settings [R]
   • Research evidence-based programs for maintaining healthy BMI in college-age adults [SS]
   • Implement community interventions that increase access to affordable healthy foods and places to be physically active [SS]

Objective 7: Reduce the proportion of youth grades 9-12 who report a BMI (height and weight self-report) greater than the sex and age specific 95th percentile from CDC growth charts (HP 2010).
   Strategies:
   • Expand physical activity requirements in schools through grade 12 [EUR]
   • Expand coordinated school health requirements through grade 12 [EUR]
   • Strengthen and enforce existing physical activity, nutrition, and coordinated school health policies for all grades [EUR]
   • Implement community interventions that increase access to affordable healthy foods and places to be physically active [SS]

Objective 8: Reduce the proportion of adults who smoke cigarettes (HP 2010).
   Strategies:
   • Increase the unit price of tobacco products [SE]
   • Provide health care provider counseling [SE]
   • Implement multi-component campaigns that include use of mass media, enforcement, school and community prevention campaigns, and tobacco cessation [SE]
   • Implement smoke-free policies in public places, including worksites [SE]
   • Advocate for statewide smoke-free policies [SE]

Objective 9: Reduce the proportion of youth grades 9-12 who report having ever smoked cigarettes daily, at least one cigarette every day, for 30 days (HP 2010).
   Strategies:
   • Increase unit price of tobacco products [SE]
   • Provide health care provider counseling [SE]
   • Implement multi-component campaigns that include use of mass media, enforcement, school and community prevention campaigns, and tobacco cessation [SE]
   • Enforce laws prohibiting sale of tobacco to minors [SE]

Objective 10: Reduce the death rate from cardiovascular disease and stroke in persons with diabetes (HP 2010).
    Strategies:
    • Promote risk reduction for cardiovascular disease and stroke in persons with diabetes [IE]
    • Promote the use of clinical practice guidelines and an integrated approach for managing persons with diabetes to reduce risk for cardiovascular disease and stroke [IE]
    • Improve access to care for underserved populations [R]
    • Implement chronic disease self-management coverage by third party payers [IE]

Goal III: Texans will experience improved cardiovascular health and quality of life through the Early Detection and Treatment of Heart Attack and Stroke

Objective 1: Increase the proportion of eligible patients with witnessed out-of-hospital cardiac arrests who receive their first therapeutic electrical shock within six minutes of recognition/collapse (HP 2010).
    Strategies:
    • Increase automated external defibrillator (AED) placement, seeking policy change to mandate AED placement in public places [SS]
    • Place AEDs with all responders, not just emergency medical service (EMS) responders [SS]
    • Include AED placement as part of risk management/risk reduction in worksites [R-OSHA]
    • Provide public education in CPR and the use of AEDs and seek policy change requiring city employees to be CPR/AED trained [SS]
    • Monitor and improve, where necessary, EMS response and delivery times [SE]

Objective 2: Increase the proportion of adults 20 years and older who call 911 and administer CPR when they witness an out-of-hospital cardiac arrest (HP 2010).
    Strategies:
    • Provide community based group training in CPR and the use of AEDs [SS]

Objective 3: Increase the proportion of adults who are aware of the early warning signs and symptoms of heart attack; stroke; and the importance of calling 911 if a heart attack or stroke is suspected (HP 2010).
    Strategies:
    • Promote the use of evidence-based public education programs tailored to the appropriate audience [R]
    • Partner with Emergency Medical Services and 911 authorities to serve as a conduit for information dissemination [R]

Objective 4: Increase the number of Texas recognized stroke facilities that can provide multiple levels of stroke care to meet the full continuum of stroke care from EMS activation to outpatient rehabilitation and support.
    Strategies:
    • Support the dissemination of information regarding stroke resources and the use of maps to identify stroke care hospitals in Texas [IE]
    • Support efforts to establish regional stroke committees [IE]
    • Provide assistance for hospitals working to become certified primary stroke centers [R – ASA, BAC]
    • Work with hospitals, especially in medically underserved areas, to move towards achieving higher levels of stroke care [R-ASA]

- Continue to support efforts of Regional Advisory Councils to adopt and implement protocols for stroke transport [R – ASA]
- Continue support of statewide stroke initiative [R – ASA, SS]

Objective 5: Increase access to cardiovascular disease and stroke prevention, early detection, and treatment services for underserved populations.
Strategies:
- Expand the cardiovascular health care system to include non-traditional partners that can assist in improving access to care [IE]
- Seek opportunities to create incentives for health care system partners to address quality of care issues [SS]

Objective 6: Increase the proportion of eligible patients with heart attacks who receive artery-opening therapy within an hour of symptom onset (HP 2010).
Strategies:
- Monitor and improve, where necessary, EMS response and delivery times [SS]
- Promote implementation of clinical practice guidelines among emergency health care system personnel [SS]
- Provide evidence-based, interactive health care provider education [SS]
- Monitor and assess quality of care provided [R - AHRQ]
- Identify and address heart disease and stroke health care workforce shortage issues [IE]
- Continue support of statewide STEMI initiative [R – AHA, SS]

Goal IV: Texans will experience improved cardiovascular health and quality of life through the Prevention of Recurrent Events

Objective 1: Increase utilization of appropriate therapeutic interventions and application of clinical practice guidelines for treating patients with cardiovascular disease and stroke.
Strategies:
- Where appropriate, provide health care professional education regarding protocols and guidelines for the early detection, treatment, and long-term management of cardiovascular disease and stroke patients [SS]
- Identify and address barriers to routine utilization of therapeutic interventions and clinical practice guidelines [SS]

Objective 2: Increase the proportion of persons with cardiovascular disease and stroke who are aware of resources regarding CVD and stroke and the prevention of recurrent events.
Strategies:
- Continue to enhance web-based resources for patients [IE]
- Partner with health promotion experts to develop culturally appropriate communication [SS]
- Work through community networks to share information and resources [IE]

Objective 3: Increase the proportion of adults who report having had CVD, including stroke, have high blood pressure, and who are taking at least two actions (for example: losing weight, participating in physical activity, reducing sodium intake, taking medications as prescribed).
Strategies:
- Implement community outreach and worksite programs promoting healthy eating (for example the DASH eating plan), physical activity, smoking cessation, and healthy weight [SS]

- Identify, disseminate, and promote utilization of evidence-based guidelines for hypertension diagnosis, treatment, and management [R]
- Promote the availability of health plans that cover/include appropriate screenings and incentives to identify, reduce and treat high blood pressure [SS]
- Encourage health care practices to use team-based care that includes a multidisciplinary team of health care professionals [SS]
- Promote health care system level solutions that use practitioner and patient reminders and medical records flags [R]
- Work with third party payers to reimburse for high blood pressure management [SS]
- Increase access to primary health care and affordable medications for underserved populations [R]
- Assess and address barriers to compliance with physician recommendations and prescribed medications [IE]

Objective 4: Increase the proportion of adults 18-75 who had an LDL-c level of less than 130mg/dL during the measurement year, after discharge for an acute cardiovascular event.
Strategies:
- Promote implementation of screening guidelines by health care professionals [SE]
- Promote the availability of health plans that cover/include appropriate screenings and incentives to identify, reduce and treat high LDL-c [SS]
- Encourage health care practices to use team-based care that includes a multidisciplinary team of health care professionals [SS]
- Promote health care system level solutions that use practitioner and patient reminders and medical records flags [R]
- Work with third party payers to reimburse for cholesterol management [SS]
- Increase access to primary health care and affordable medications for underserved populations [R]
- Assess and address barriers to compliance with physician recommendations and prescribed medications [IE]

Goal V: Texas will experience Improved State and Local Capacity to Address Heart Disease, Stroke, and Related Risk Factors

Objective 1: Improve statewide monitoring and surveillance of emergency health care system information.
Strategies:
- Create a statewide, uniform, multi-disciplinary system for tracking EMS patient data from notification of emergency to hospital discharge [SS]
- Work collaboratively with stakeholders to identify data needs, collection methods, reporting formats, and funding sources [SS]
- Continue to assimilate current available data, monitor trends, evaluate programs and policies, and recommend improvements [R - CDC]
- Develop new or enhance existing web-based access to data and resources and improve information sharing among Texas stakeholders [IE]
- Partner with Federally Qualified Health Centers to share local data [IE]

Objective 2: Increase resources available to advance prevention efforts and improve the Texas heart and stroke system of care.

Strategies:
- Support additional funding opportunities to better address heart disease, stroke, and their risk factors [R – NACDD]
- Support advocacy efforts to increase funding for the prevention and control of cardiovascular disease and stroke [SS]
- Increase collaboration, create synergy, and leverage existing resources among Texas stakeholders [SS]
- Use local data to educate policymakers about issues and the need for funding [SS]

Objective 3: Increase the number of Heart and Stroke Healthy communities in Texas.

Strategies:
- Promote the implementation and monitoring, by Texas cities, of Heart and Stroke Healthy City Recognition Program indicators [R - CDC]
- Establish regional or local advisory groups or partnerships to work on meeting criteria [SS]
- Expand collaboration and connectivity among health related organizations [SS]
- Develop a uniform community report of healthy cities [IE]

Objective 4: Increase communication and collaboration between system partners and Texas communities.

Strategies:
- Explore and support opportunities to expand the existing trauma model into a statewide, comprehensive emergency health care system model that includes stroke and cardiac events [IE]
- Continue to advance the power and commitment of the Texas Heart Disease and Stroke Prevention System Partnership to impact change in Texas [SS]
- Explore the use of web casts to share progress and emerging information [SS]
- Develop a consortium to spearhead public official education about heart disease and stroke and advocate for policies and plans that support cardiovascular health and wellness [SS]
- Expand partnerships with stakeholders such as those in the Texas Public Health Coalition to strengthen enforcement of laws and regulations that protect health and ensure safety related to heart disease and stroke [IE]
- Establish a research and translation consortium focusing on emerging science, development of innovative solutions, and translation of research into practice for heart disease and stroke [SS]

Key to Symbols
SE: The strategy is supported with **S**trong **E**vidence and recommended by the Guide to Community Preventive Services or the US Preventive Services Task Force
SE- Other: Supported with **S**trong **E**vidence by the indicated agency
EUR: The **E**vidence to support the effectiveness of the strategy is currently **U**nder **R**eview (as of June 2008)
R: The strategy is **R**ecommended by the Guide to Community Preventive Services, the US Preventive Services Task Force, or the CDC
R-Other: The strategy is **R**ecommended by the indicated agency
SS: **S**tudies **S**uggest the approach may be effective
IE: The strategy currently has **I**nsufficient **E**vidence to support a recommendation. This does not mean the strategy is ineffective. There are simply no current studies testing the strategy in the population of interest. In some cases, researchers have indicated a need for further investigation of the issue

Implementing the *Plan*

Texas Council on Cardiovascular Disease and Stroke

The Texas Council on Cardiovascular Disease and Stroke (Council), established by the Texas Legislature in 1999, is a fifteen-member council charged with developing and implementing a plan to reduce heart disease and stroke in Texas. Unfunded, the Council's efforts are supported by staff of the Cardiovascular Health and Wellness Program at the DSHS and over 390 volunteers whom have partnered with the Council over the years.

The Council approaches its work through four key strategy areas: surveillance, data, and outcomes measurement; health education and outreach; community policy and environmental change; and clinical prevention and treatment services. The Council monitors available epidemiologic data to assess impact and direct planning resources. Work groups around each strategy meet quarterly to plan and implement activities.

Council activities that serve to implement the *Plan* have included two grant funded projects: The Secondary Prevention of Cardiovascular Disease in Medicaid Clients and The Awareness, Control, and Treatment of High Blood Pressure in Hispanics. The Council's Heart and Stroke Healthy City Recognition Program has encouraged and recognized cities for implementing local policies and systems changes to support their citizens in living a heart and stroke healthy lifestyle.

The Council, in collaboration with partners, has identified two priority issues that require immediate attention during the 2010-2011 biennium:
- Reduce the incidence of stroke in Texas by implementation of a state stroke prevention plan.
- Prevent, treat, and control heart disease and heart attacks by providing grants to cities to improve their ability to implement evidence-based policies and programs for their citizens.

The Council intends to seek appropriation of funds and FTE's for the 2010-2011 biennium for these priorities.

Members of the Council have lent their expertise to the Texas Heart Disease and Stroke Prevention System Partnership in the recent process for updating the *Texas Plan to Reduce Heart Disease and Stroke*.

Texas Cardiovascular Health and Wellness Program

The Cardiovascular Health and Wellness (CHW) Program at the Department of State Health Services is one of 21 state programs funded by the CDC to provide capacity building for state public health and health care infrastructures.

Capacity building states are funded to:
- Facilitate collaboration among public and private sector partners.
- Define the burden of heart disease and stroke and assess existing population-based strategies for primary and secondary prevention of heart disease and stroke within the state.

- Develop and update a comprehensive state plan for heart disease and stroke prevention with emphasis on heart-healthy policies development, physical and social environmental change, and disparities elimination (e.g., based on geography, gender, race or ethnicity, or socioeconomic status).
- Identify culturally appropriate approaches to promote heart disease and stroke prevention among racial, ethnic, and other priority populations.
- Use population-based public health strategies to increase public awareness of the heart disease and stroke urgency; the signs and symptoms of heart disease and stroke; and the need to call 911.

The Texas CHW Program provides technical assistance, training, and consultation on the development of policy and environmental change strategies to decrease risk factors for heart disease and stroke and increase chances for people in Texas to establish a heart and stroke healthy lifestyle. Targeted sites include worksites, schools, food establishments, communities and health care settings. The Program works in collaboration with the Texas Council on Cardiovascular Disease and Stroke and the Texas Heart Disease and Stroke Prevention System Partnership to accomplish its objectives and implement the state plan.

Texas Heart Disease and Stroke Prevention System Partnership

The Texas Heart Disease and Stroke Prevention System Partnership is a network of stakeholders from across the state representing state and local, public and private, health care, academic, volunteer, and business sectors. See Appendix III for a list of partners. Partners have been working together for the past two years to assess the current status of the public health infrastructure in supporting heart disease and stroke prevention in Texas; determine gaps and identify needs within the infrastructure; and develop a coordinated, collaborative and comprehensive statewide plan. Objectives, priorities, and action items identified by the Partnership over the past two years have been folded into the 2008 *Plan*.

The Partnership is currently in the process of identifying a structure and operational processes for moving from assessment and planning to taking action. In the spring of 2008, the Partnership identified one objec-

tive from each of the first four goals as priority objectives for taking action. Over the coming year, the Partnership will begin planning for implementation of strategies under these objectives.

Objectives within the fifth goal will be implemented as partners work to increase capacity at the state and local levels to implement Goals I-IV. Increasing communication and collaboration among stakeholders to leverage resources and seeking additional funding are important strategies identified by the Partnership to further develop state and local infrastructures. Improving cardiovascular disease and stroke surveillance and effectively communicating issues to state and local policymakers, organizational leaders, and the public will be critical components in the successful implementation of the *Plan*.

Key Partners and Collaborations

Key partner organizations represented in the Texas Heart Disease and Stroke Prevention System Partnership include the American Heart Association/American Stroke Association South-Central Affiliate, the Texas Medical Association, the Texas Association of Local Health Officials, the Texas Medical Foundation Health Quality Institute, the Texas Public Health Association, and DSHS.

Because cardiovascular disease and stroke have common primary and secondary risk factors with other chronic diseases, collaboration among those working in chronic disease is essential. The Partnership includes individuals working for public and private entities with a focus on obesity, physical activity and nutrition, school health, diabetes, and tobacco prevention and control. The 2008 *Texas Plan to Reduce Cardiovascular Disease and Stroke* complements other state plans including the *Obesity Plan*, the *Diabetes Plan*, the *Cancer Plan*, and the *Tobacco Plan*.

Invitation to Participate

As the Partnership continues to work together to implement the 2008 *Plan*, membership representation that reflects the diversity of cardiovascular disease and stroke stakeholders and the populations and communities impacted by CVD and stroke in Texas will be an important factor. If you and your organization are willing to join the Partnership as it moves forward into taking concrete action to implement the 2008 *Plan*, please visit the Partnership web page at www.dshs.state.tx.us/wellness/partnership.shtm and respond to the 'Invitation to Join' at the bottom of the page.

A Model for Action

A logic model is a tool for graphically representing the relationships between a program's activities and its intended effects, the assumptions that underlie expectations, and the context in which the program will operate. A logic model is not a static document and should be revised periodically to reflect new evidence, lessons learned, and changes in context, resources, activities, and expectations.[41]

The logic model found on the back of the centerfold represents the critical entities that are needed for successful *Plan* implementation; major activities that will take place, especially those involving the coordinated efforts of the Partnership; concrete outputs that will be generated along the way; and expected short, intermediate, and long term outcomes.

The objectives for the 2008 *Plan* are, for the most part, taken directly from Healthy People 2010 and are measurable using existing surveillance data. Data sources are described in Appendix II.

Targets for 2012 were set by analyzing trends for the past five years and estimating a reasonable change that, with focused efforts, could be achievable. In some cases, targets have been set by chronic disease partners working on the same or similar objectives. Progress is expected to be made for most objectives, but it is only through the coordinated efforts of partners working to reduce cardiovascular disease and stroke across Texas and the availability of adequate resources and funding that all *Plan* objectives will be met.

Some objectives are related to improving the infrastructure and processes that support cardiovascular health and wellness in our communities. These objectives are just now beginning to be addressed. Indicators for measuring success have not been identified or baseline data is not yet available.

Texas Benchmark Indicators, Baselines, and 2012 Targets

Benchmark Indicators	Baseline			2012 Target
	Data Source	Measure	Year	
Long term Goal: Reduce premature death from heart disease and stroke.				
Age adjusted mortality (per 100,000) for ischemic heart disease	TX Vital Statistics	151.8	2005	136.6 (10% reduction)
Age adjusted mortality (per 100,000) for stroke	TX Vital Statistics	52.1	2005	46.9 (10% reduction)
Goal I: Texans will experience improved cardiovascular health and quality of life through the Prevention of Risk Factors.				
Proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day (HP 2010)	BRFSS	46.5%	2007	50%
Proportion of youth grades 9-12 who have been physically active for a total of 60 minutes per day on 5 or more days per week (HP 2010)	YRBSS	45.2%	2007	50%
Proportion of adults who engage in no leisure-time physical activity (HP 2010)	BRFSS	28.3%	2007	20%
Proportion of adults 18 and older who report eating fruits and vegetables 5 or more times per day (HP 2010)	BRFSS	25.2%	2007	35%
Proportion of youth grades 9-12 who report eating fruits and vegetables 5 or more times per day (HP 2010)	YRBSS	17.4%	2007	25%
Proportion of youth grades 9-12 who report using any type of tobacco on one or more days in the past 30 days (HP 2010)	YRBSS	Cigarettes 21.1% Dip/chew 7.9% Cigars/ cigarillos 15.2%	2007	19% 7.1% 13.7% (10% reduction in each category)
No exposure to second hand smoke (HP 2010)	BRFSS	82.1% in the home 77.9% in public places	2007	90% (10% increase) 100% (smoke-free state)

Texas Benchmark Indicators, Baselines, and 2012 Targets

Benchmark Indicators	Baseline			2012 Target
	Data Source	Measure	Year	
Goal II. Texans will experience improved cardiovascular health and quality of life through the Detection and Treatment of Risk Factors.				
Proportion of adults 18 and older with high blood pressure (HP 2010)	BRFSS	27.8%	2007	25% (10% reduction)
Proportion of adults with high blood pressure whose blood pressure is under control (HP 2010)	HEDIS	57.7%	2007	63.5% (10% increase)
Proportion of adults with high blood pressure who are taking at least 2 actions (for example: losing weight, participating in physical activity, reducing sodium intake, taking meds as prescribed) (HP 2010)	BRFSS	86.7%	2007	95% (10% increase)
Proportion of adults who have had their blood cholesterol checked within the preceding 5 years (HP 2010)	BRFSS	70.7%	2007	74% (5% increase)
Proportion of adults who report having high blood cholesterol (HP 2010)	BRFSS	38.5%	2007	31% (20% reduction)
Proportion of adults who report a BMI (height and weight self report) greater than 25 KG/M^2 (HP 2010)	BRFSS	65.7%	2007	$\leq 62.3\%$
Proportion of youth grades 9-12 who report a BMI (height and weight self-report) greater than the sex and age specific 95th percentile from CDC growth charts (HP 2010)	YRBSS	15.9%	2007	14.3% (10% reduction)
Proportion of adults who smoke cigarettes (HP 2010)	BRFSS	19.3%	2007	16.4% (15%reduction)
Proportion of youth grades 9-12 who report having ever smoked cigarettes daily, at least 1 cigarette daily for 30 days (HP 2010)	YRBSS	11.3%	2007	10% (10% reduction)
Death rate (per 100,000) from cardiovascular disease and stroke in persons with diabetes (HP 2010)	VS	26.1	2005	23.5 (10% reduction)
Goal III. Texans will experience improved cardiovascular health and quality of life through the Early Detection and Treatment of Heart Attack and Stroke.				
Proportion of eligible patients with witnessed out-of-hospital cardiac arrests who receive their first therapeutic electrical shock within 6 minutes of recognition/collapse (HP 2010)	Texas EMS data	34% < 6 46% > 6 20% unknown	2004	20% increase in % of responses under 6 minutes
Proportion of adults 20 years and older who call 911 and administer CPR when they witness an out-of-hospital cardiac arrest (HP 2010)	**Potential data sources: NHIS, CDC, NCHS**			**Developmental – baseline to be determined**
Proportion of adults who are aware of the early warning signs and symptoms of heart attack; stroke; and the importance of calling 911 if a heart attack or stroke is suspected (HP 2010)	BRFSS	Heart attack – 8.9% Stroke – 16.9% First call 911 – 85.1%	2005	10% increase in all areas
Number of Texas recognized stroke facilities that can provide multiple levels of stroke care to meet the full continuum of stroke care from EMS activation to outpatient rehabilitation and support	**Possible data sources: ASA, Texas EMS**			**Developmental – baseline to be determined**
Access to cardiovascular disease and stroke prevention, early detection, and treatment services for underserved populations	**Possible data sources: AHRQ, BRFSS, FQHC**			**Developmental – baseline to be determined**
Proportion of eligible patients with heart attacks who receive artery-opening therapy within an hour of symptom onset (HP 2010)	**Possible data sources: HCFA**			**Developmental – baseline to be determined**

Texas Benchmark Indicators, Baselines, and 2012 Targets

Benchmark Indicators	Baseline			2012 Target
	Data Source	Measure	Year	
Goal IV. Texans will experience improved cardiovascular health and quality of life through the Prevention of Recurrent Events.				
Utilization of appropriate therapeutic interventions and application of clinical practice guidelines for treating patients with cardiovascular disease and stroke	**Developmental – baseline to be determined**			
Proportion of persons with cardiovascular disease and stroke who are aware of resources regarding CVD and stroke and the prevention of recurrent events	**Possible data sources: Partnership members, web site utilization, statewide survey**			**Developmental – baseline to be determined**
Proportion of adults who report having had CVD and have high blood pressure who are taking at least 2 actions (for example: losing weight, participating in physical activity, reducing sodium intake, taking meds as prescribed)	BRFSS	At least 2 = 91.7% At least 3 = 80.7%	2007	At least 2 = 100% At least 3 = 89% (10% increase)
Proportion of adults 18-75 who had an LDL-c level of less than 130 mg/dL during the measurement year, after discharge for an acute cardiovascular event	HEDIS	46.8%	2006	56% (20% increase)
Goal V: Texas will experience Improved State and Local Capacity to Address Heart Disease, Stroke, and Related Risk Factors.				
Statewide monitoring and surveillance of emergency health care system information – availability, quality and reliability of data	**Possible data source: Texas EMS surveillance system**			**Process measure – Indicators and baseline to be determined**
Resources available to advance prevention efforts and improve the Texas heart and stroke system of care – quantity (dollars, # partners, dollar estimate of partner contributions); quality (diversity of partnership, level of commitment by partners)	**Possible data sources: statewide survey, environmental scan**			**Process measure – Indicators and baseline to be determined**
Number of Heart and Stroke Healthy cities in Texas and level of achievement (Gold, Silver, Bronze, Honorable Mention)	DSHS	Gold – 2 Silver – 2 Bronze – 1 Honorable Mention - 5	2006-2007	100% increase in # cities with HM or above; growth from one level to the next in at least 10 communities
Satisfaction with communication and collaboration among system partners and Texas communities	**Data source: Partnership surveys**			**Process measure – Indicators and baseline to be determined**

References

1 *A Public Health Action Plan to Prevent Heart Disease and Stroke.* United States Department of Health and Human Services, 2003.

2 *Heart Disease and Stroke Statistics: 2008 Update At A Glance.* American Heart Association, 2008.

3 Behavioral Risk Factor Surveillance System, Center for Health Statistics, Texas Department of State Health Services, 2008.

4 Texas Vital Statistics Unit, Center for Health Statistics, Texas Department of State Health Services, 2008.

5 Texas Health Care Information Collection, Center for Health Statistics, Texas Department of State Health Services, 2008.

6 State Specific Mortality form Sudden Cardiac Death, United States 1999. *Morbidity and Mortality Weekly Report*, Vol 51, No 6, Centers for Disease Control and Prevention, 2002.

7 *Sudden Cardiac Death.* American Heart Association. Downloaded from www.americanheart.org on June 9, 2008.

8 *Hands-Only Cardiopulmonary Resuscitation: A Call to Action for Bystander Response to Adults Who Experience Out-of-Hospital Sudden Cardiac Arrest.* Authors: Sayre, Berg, Cave, Page, Potts, and White. AHA Science Advisory, 2008:117:2162-2167.

9 *Preventing and Treating Stroke: Legislative Policy Brief.* The Council on State Governments Healthy States Initiative. August, 2007.

10 *Income, Poverty, and Health Insurance Coverage in the United States: 2006.* US Census Bureau Aug 2007.

11 *The 7th Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.* US Department of Health and Human Services, 2003.

12 *Prevent and Control America's High Blood Pressure: Mission Possible.* National Heart, Lung, and Blood Institute. Downloaded from http://hp2010.nhlbihin.net on June 9, 2008.

13 *Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults.* National Institutes of Health, National Heart, Lung, and Blood Institute, 2001.

14 *National Diabetes Fact Sheet, US 2005.* Centers for Disease Control and Prevention.

15 *Diabetes and Disparity: A Plan to Prevent and Control Diabetes in Texas, 2008-2009.* Texas Diabetes Council.

16 Redefining Diabetes Control. *Diabetes & Cardiovascular Disease Review*, Issue 1, 2002.

17 *Diabetes: Heart Disease and Stroke.* American Diabetes Association. Downloaded from www.diabetes.org on June 9, 2008.

18 QuickStats: Age-Adjusted Percentage of Adults Age ≥ 40 Years with Diagnosed Diabetes Who Have Glycosylated Hemoglobin, Total Blood Cholesterol, and Blood Pressure under Control, by Race/Ethnicity – National Health and Nutrition Examination Survey, United States, 2003-2006. *MMWR Weekly*, June 13, 2008.

19 Annual Smoking – Attributable Mortality, Years of Potential Life Lost, and Productivity Losses – United States, 1997 – 2001. *MMWR Weekly*, July 1, 2005.

20   Youth Risk Behavior Surveillance System, Centers for Disease Control and Prevention, 2007 Survey.

21   *World Health Organization International Agency for Research on Cancer Monographs on the Evaluation of Carcinogenic Risks to Humans*, Volume 83: Tobacco Smoke and Involuntary Smoking, July 2002.

22   *Texas Tobacco Control Plan 2008*: A statewide action plan for tobacco prevention and control in Texas. Texas Cancer Council, 2008.

23   *Expert Committee Recommendations on the Assessment, Prevention, and Treatment of Child and Adolescent Overweight and Obesity* – 2007, National Initiative for Children's Healthcare Quality.

24   Overweight and Obesity: A Vision for the Future. *The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity*. Downloaded from http://www.surgeongeneral.gov/topics/obesity/ on June 9, 2008.

25   Keeping Active, Not Smoking Can Reduce but not Abolish CV Risk of Obesity. Authors: Wood, S & Lie, D. *Medscape Medical News*. Downloaded from www.medscape.com on June 26, 2008.

26   State-Level Estimates of Annual Medical Expenditures Attributable to Obesity. Authors: Finkelstein, Fiebelkorn, & Wang. *Obesity Research*, Vol 12, No. 1, January 2004.

27   State-Specific Prevalence of Obesity Among Adults – United States, 2005. *MMWR Weekly*, September 15, 2006.

28   *Updates for the Strategic Plan for the Prevention of Obesity in Texas*. Texas Department of State Health Services, 2008.

29   So Many Nutrition Recommendations – Contradictory or Compatible? Author: Franz, Marion. *Diabetes & Cardiovascular Disease Review*, Issue 4, 2003.

30   *Our 2006 Diet and Lifestyle Recommendations*. Downloaded on July 11, 2008 from www.americanheart.org.

31   Fruit and Vegetable Consumption Among Adults – United States, 2005. *MMWR Weekly*, March 16, 2007.

32   Early Nutrition and Long-Term Cardiovascular Health. Author: Singhal. *Nutrition Reviews*, Vol 64, No. 5, s44-s49, May 2006.

33   *Healthy People 2010, Volumes I and II*. United States Department of Health and Human Services, 2000.

34   *Physical Activity for Everyone*. Centers for Disease Control and Prevention. Downloaded from www.cdc.gov on June 9, 2008.

35   *Chronic Disease Indicators*. Centers for Disease Control and Prevention. Downloaded from http://apps.nccd.cdc.gov/cdi on May 8, 2008.

36   2007 JEMS 200 City Survey: Is the Status Quo Acceptable? Author: Williams, David. *JEMS*, February 2008.

37   *Emergency Medical Response Time for Cardiovascular Disease,* Texas EMS/Trauma Registry, Texas Department of State Health Services, 2004.

38   Quality of Care by Classification of Myocardial Infarction. Authors: Roe, Parsons, Pollack, Canto, Barron, Every, Rogers, Peterson. *Archives of Internal Medicine*, Vol 165, No. 14, July 25, 2005.

39 *Mission: Lifeline, STEMI Overview and Recommendations.* American Heart Association, 2007.

40 *The Future of the Public Health in the 21st Century*. Institute of Medicine, National Academies Press, 2003.

41 *Evaluation Guide: Developing and Using a Logic Model*. Centers for Disease Control and Prevention, Division for Heart Disease and Stroke Prevention, n.d.

Resources Used in Determining Strongly Recommended Strategies

Guide to Community Preventive Services. Centers for Disease Control and Prevention. Downloaded from www.thecommunityguide.org on May 8, 2008.

Screening for Coronary Heart Disease. US Preventive Services Task Force, Agency for Health Care Research and Quality. Downloaded from www.ahrq.gov on May 8, 2008.

Screening for Lipid Disorders. US Preventive Services Task Force, Agency for Health Care Research and Quality. Downloaded from www.ahrq.gov on May 8, 2008.

Screening for High Blood Pressure. US Preventive Services Task Force, Agency for Health Care Research and Quality. Downloaded from www.ahrq.gov on May 8, 2008.

Counseling to Prevent Tobacco Use and Tobacco-Caused Disease. US Preventive Services Task Force, Agency for Health Care Research and Quality. Downloaded from www.ahrq.gov on May 8, 2008.

Resources for Action

The following organizations provide public and professional education, programs, and resources for cardiovascular disease and stroke. This is not intended to be an exhaustive list but provides a sampling of what is already available from credible sources. Before selecting and using any program, seek information regarding the efficacy or adaptability of the program for your intended population.

American Heart Association/American Stroke Association
Web site: www.americanheart.org
- Heart Disease and Stroke Statistics
- Get With the Guidelines – hospital guidelines for heart disease and stroke
- Acute Stroke Treatment Program – hospital-based guide for primary stroke centers
- Search Your Heart – program for African Americans and Hispanics/Latinos
- Give Me 5 for Stroke! – Stroke Collaborative awareness campaign
- Heartsaver AED Anytime – workplace training program
- Go Red For Women – public awareness campaign
- CPR Anytime – general public training program

Centers for Disease Control and Prevention
Web site: www.cdc.gov
- Guide to Community Preventive Services – guide to evidence-based practices
- Heart Healthy and Stroke Free – creating social environment changes
- Weight Management Research to Practice Series – evidence-based approaches
- A Purchasers Guide to Clinical Preventive Services – for employers selecting benefits packages
- Successful Business Strategies to Prevent Heart Disease and Stroke Toolkit – making the business case
- Promoting Physical Activity: A Guide for Community Action
    Web site: www.cdc.gov/nccdphp/dnpa/pahand.htm

Texas Department of State Health Services
Web site: www.dshs.state.tx.us
- Diabetes and Disparities: A Plan to Prevent and Control Diabetes in Texas, 2008-2009
    Web site: www.dshs.state.tx.us/diabetes/default.shtm
- Updates for the Strategic Plan for the Prevention of Obesity in Texas 2008
    Web site: www.dshs.state.tx.us/obesity/default.shtm
- Cardiovascular Health and Wellness Program
    Web site: www.dshs.state.tx.us/wellness/healthed.shtm
    — Lighten Up Texas – worksite weight loss team competition
    — Walk Texas – community program with focus on diabetes
    — Five A Day – Five A Week Challenge – community fruit and vegetable program
    — Maintain No Gain – maintaining weight over the holidays
    — Skyscraper Climb – worksite physical activity

Brain Attack Coalition
Web site: www.stroke-site.org/
- Guidelines and resources for stroke initiatives

Department of Health and Human Services
Web site: www.hhs.gov/diseases/
- Facts About the DASH Eating Plan
    Web site: www.centerforamericannurses.org/wellness/health/dash.pdf
- Healthy People 2010
    Web site: www.healthypeople.gov/

National Stroke Association
Web site: www.stroke.org
　　• Information and resources for stroke initiatives

Wellness Councils of America
Web site: www.welcoa.org/
　　• Building World Class Wellness Programs

Texas Education Agency Approved Coordinated School Health Programs
Web site: www.tea.state.tx.us/curriculum/hpe/approvedcshp.html

　　• Bienestar Health Program - Office Phone: (210) 533-8886
　　　Toll Free: 1-866-676-7472
　　　Web site: www.sahrc.org

　　• CATCH
　　　Telephone: 512-346-6163
　　　Web site: www.sph.uth.tmc.edu/catch/

　　• The Great Body Shop
　　　Telephone: 800-782-7077
　　　Web site: www.thegreatbodyshop.net/

　　• Healthy and Wise by Caprock Press
　　　Telephone: 800-383-1927
　　　Web site: www.caprockpress.com/

National Heart, Lung, and Blood Institute
Web site: www.nhlbi.nih.gov
　　• Hearts N' Parks Community Mobilization Guide: Obesity Education Initiative
　　• Su Corazon Su Vida – Your Heart Your Life
　　• Your Guide to Lowering Your Blood Pressure with the DASH Eating Plan

Bridges to Excellence
Web site: www.bridgestoexcellence.org/
　　• Quality improvement program for the health care industry

Chronic Disease Self-management Program
Web site: http://patienteducation.stanford.edu/programs/cdsmp.html
　　• Patient oriented program for self-management of chronic disease

American Pharmacists Association Foundation
　　• Project ImPACT
　　　Web site: www.aphafoundation.org/programs/Project%5FImPACT/
　　　practice model for pharmacists to improve patient outcomes

Promising Practices - database of evidence-based approaches to managing chronic disease
Web site: http://promisingpractices.fightchronicdisease.org/programs/target/cardiovascular_disease

Data Sources

BRFSS - The Texas Behavioral Risk Factor Surveillance System, initiated in 1987, is a federally funded telephone survey conducted on a monthly basis of 500 randomly selected Texas households to collect data on lifestyle risk factors contributing to the leading causes of death and chronic diseases. As a primary source for comprehensive statewide data on preventive health practices and health risk behaviors, BRFSS is an important tool for decision making through out DSHS and the public health community. Public and private health authorities at the federal, state, and local levels rely on BRFSS to identify public health problems, design policy and interventions, set goals, and measure progress toward those goals.

YRBSS - Youth Risk Behavior Surveillance Survey monitors priority health-risk behaviors and the prevalence of obesity and asthma among youth and young adults. The YRBSS includes a national school-based survey conducted by the Centers for Disease Control and Prevention and state, territorial, tribal, and local surveys conducted by state, territorial, and local education and health agencies and tribal governments.

VS - Texas Vital Statistics provides records for births or deaths that have occurred in Texas from 1903 to the present. Vital statistics refers to demographic data on births, deaths, fetal deaths, abortions, marriages, and divorces. At the Department of State Health Services, vital statistics functions are distributed within two organizational units: the Center for Health Statistics (CHS) and the Vital Statistics Unit (VSU). The Data Management team within CHS is responsible for developing, analyzing, and distributing public health data derived from records of vital events. The team also responds to statistical data requests and develops the Texas Vital Statistics Annual Report.

HEDIS - The Health Plan Employer Data and Information Set consists of standardized performance measures designed for comparing the quality of care of managed care organizations. As reported by the *State of Managed Care Quality (2004)*, this tool is used by more than 90 percent of America's health plans to measure performance on important dimensions of care and service. HEDIS® is developed and maintained by the National Committee for Quality Assurance (NCQA), a private non-profit organization committed to assessing, reporting, and improving the quality of care provided by organized health care delivery systems.

Texas EMS/Trauma Registry - The Texas EMS/Trauma Registry is a legislatively mandated program responsible for collecting, analyzing, and disseminating information on emergency medical services runs and the occurrence of trauma in Texas including spinal cord injuries, traumatic brain injuries, and submersion injuries. EMS providers and acute care hospitals, designated to provide trauma care, must report trauma cases to the EMS/Trauma Registry. The EMS/Trauma Registry uses information on injuries to investigate the causes of injuries, their distribution, health outcomes, and associated costs. Local communities and providers rely on the data from the EMS/Trauma Registry to evaluate the trauma system in Texas and to plan injury prevention programs.

Texas Partners

The following people/organizations have all generously contributed their time to the development of this *Plan* as members of the Texas Heart Disease and Stroke Prevention System Partnership.

David Aguilar, MD
Baylor College of Medicine

Selina Ahmed
Texas Southern University

Lisa Aimsworth
Limestone Medical Center

Kelli Amick
Pfizer, Inc

Jose Antu
City of Laredo Health Department

Cassandra Arceneaux, MD, MPH
Galveston County Health District

Yvonne Athanatos, RN, BSN
Laredo Independent School District

Anthony Baird, DSc
Sierra Providence Health Network

Roger Barker
Waco-McLennan County Public Health
District

Sue Beatty
El Paso City-County Health and
Environmental District

Lisa Betterson
Texas Department of State
Health Services

Nancy Bieri, BSN, RN
Texas Medical Association

Casey Blass
Texas Department of State
Health Services

Winston Bowie
Houston Department of Health
and Human Services

Brian Bowser
American Heart Association

Cheryl Brien-Warren
Texas Department of State Health
Services

Patricia Brill, PhD
Harris County Public Health and
Environmental Services

John Brink
Memorial Health System of East Texas

Paula Brookings
Midland Memorial Hospital

Chet Brooks
HHSC - Office of the Ombudsman

Audra Bryant
Texas Medical Association

Walter Buell, MD
Texas Council on Cardiovascular
Disease and Stroke

Bing Burton, PhD
Denton County Health Department

Anthony Busti, PharmD
State of Texas DUR Board/Texas Tech

Shakira Cabrera
UTHSC San Antonio

Ron Cain
Pfizer, Inc

Yolanda Cantu
University Health System

Diane Carmichael
Texas Department of State Health Services

Devon Casey, MPA
Texas Department of State Health Services

Christine Chestnut
Chestnut Productions

Scott Christopher, RN
Deep East Texas Regional Advisory Council

Marianna Clement
Waco-McLennan County Public
Health District

Michelle Cook, MPH
Texas Department of State Health Services

Ronald Cookston, EdD
Gateway to Care

Mary Lou Cornejo
Andrews County Health Department

Vicki Cowling
Texas Department of State Health Services

Brent Dalley
GETAC Stroke Committee

Mary Ann Darley
ACT/Gateway
Community Health Center, Inc.

Kate Darnell
Texas Council on Cardiovascular Disease
and Stroke

Bettye Davis-Lewis
Black Nurses Association

Liana Dawson
Texas Neurology Society

Rena (Susie) Day
University of Texas School of Public Health

Cassie DeLeon
Texas Department of State Health Services

Larissa DeLuna
American Heart Association

Christopher Dezii
Bristol-Myers Squibb Co.

Terri Dickerson, MS, CHES
Coastal Area Health Education Center

Anita Diebenow
Goodall-Witcher Healthcare Foundation

Eva Dunn
ACT/Gateway Community Health Center, Inc.

Douglas Dunsavage
American Heart Association-Texas Affiliate

Kay Durilla
Abilene-Taylor County Public Health District

Cheryl Dykes
Memorial Hermann at The Woodlands

Janie Dykes
Texas Department of State Health Services

Kelli Edmund, BS
Waco-McLennan County Public
Health District

JoLeen Eiklenborg
Texas Department of State Health Services

Richard Fennell
Memorial Health System of East Texas

Patricia Fernandez
UT Health Science Center - San Antonio

Brent Fields
American Heart Association

H.T. Fillingim
TSA-D Big Country RAC

Janice Flewelling
The Methodist Hospital

Vincent Fonseca, MD
Texas Department of State Health Services

Janis Furness
Grayson County Health Department

Luby Garza-Abijaoude, MS, RD, LD
Texas Department of State Health Services

Angie Gass
Wichita Falls-Wichita County
Public Health Department

Mike Gilliam, Jr., MSW, MPH
Texas Department of State Health Services

Sherry Gilman, RN
Christus Spohn Hospital-Shoreline

Phyllis Gingiss, DrPH
University of Houston

Jerry Gonzalez
Sierra Medical Center

Lois Grant
Texas Department of State Health Services

Tom Guidry
Pfizer

Chase Guion
University Health System
San Antonio

Almar Gutierrez
City of Laredo Health Department

Mary Guzman, BS, RD, LD
Texas Department of State Health Services

Mike Hacker
Corpus Christi Nueces County
Public Health District

Amber Haig, CHES
Denton County Health Department

Deborah Haile
American Heart Association

Flora Hale
Midland Community Healthcare Services

Carol Lee Hamilton
Texas Public Health Association

Jo Anne Hargraves
Schering-Plough

Leslie Hargrove
Coastal AHEC

Cheryl Harrison
HCA Healthcare

Kevin Hart
University Health System

Michael Hawkins, MD
Texas Council on Cardiovascular Disease
and Stroke

Lynn Heimerl
Capital Area AHEC

Becky Heinsohn
TMF Health Quality Institute

Jennifer Herriott
San Antonio Metropolitan Health District

Bob Hillert, Jr., MD
Medicaid HDS Project Committee

Kelly Hodges
UT MD Anderson Cancer Center

Deanna Hoelscher, PhD, RD, LD, CNS
University of Texas at Houston School
of Public Health

Marsha Honea
Goodall-Witcher Healthcare

Linda Hook
Texas Public Health Association

Sarah Hooker
Denton County Health Department

Bret Howrey
UT Medical Branch – Galveston

Philip Huang, MD
Austin Travis County Health and
Human Services Department

Michelle Hunter
City of Lubbock Health Department

David Hyman, MD, MPH
Baylor College of Medicine

Amanda Ivarra
American Heart Association

Jennifer Jenkins
Providence Health Center

Johnna Jenkins
City of Lubbock Health Department

Frances Johnson
Harris County Public Health and
Environmental Services

Linda Jones
Texas Department of State Health Services

Yvette Jones
Tarrant County Public Health

Stephanie Jones-Wood
Steps to a Healthier Houston
Harris County Consortium

Jessica Keeth
Texas Department of State Health Services

Barbara Keir
Texas Department of State Health Services

Steven Kelder, MPH, PhD
Michael and Susan Dell Center for
Advancement of Healthy Living

Michael Kelly, PhD, CHES
Paso del Norte Health Foundation

Amit Khera, MD
UT Southwestern Medical Center

Jeff Kloster
Texas Education Agency

Patty Kozlowski
American Heart Association

Darwin Labarthe, MD, MPH, PhD
Centers for Disease Control and Prevention

Jonathan Lack
ROI Ventures, LP

Rob Lallier
Texas Department of State Health Services

Lee Lane
Texas Association of Local Health Officials

Peggy Lane
American Heart Association
ECC Division

Wendy Latham
Texas Association of Community
Health Centers

Linda Lawson
SPHN

Melanie Lawson (Dr)
Texas Southern University/College
of Pharmacy and Health

Lazette Lawton
Centers for Disease Prevention and
Control Project Officer

Rebecca Lee, PhD
Texas Obesity Research Center

Weihua Li
Texas Department of State
Health Services

Hardy Loe, Jr.
Texas Public Health Association

Virginia Longoria
San Patricio County Department
of Public Health

Donna Loomis
Memorial Hermann Baptist Hospitals

Valenta Luna
University Health System

David Lurie
Austin Travis County Health and
Human Services Dept.

Angela Marshall
Tarrant County Public Health

Tod Marvin
American Heart Association/
American Stroke Association

Manisha Maskay
Texas Public Health Association

Marty McCart
Texas Round Up

Sabrina McCarty
Austin/Travis County Health and
Human Services Department

Joyce McDowell, RN, BSN, CAN, LBSW
Goodall-Witcher Healthcare
Foundation

Gloria McNeil
Texas Public Health Association

Mike Messinger
Texas Department of State
Health Services

Nelda Mier (Dr)
School of Rural Public Health
Texas A & M Health Science Center

Maria Morales
Beaumont Public Health Department

Theresa Moreno
Texas Round Up

Remmy Morris
American Heart Association

Fred Morse
Bristol Myers-Squibb

Abilio Munoz, MD
Munoz Health Clinic

Latecia Murphy
Harris County Hospital District

Blaise Myers
Ector County Health Department

Don Nicholson
Texas Dept. of State Health Services

Vivian Nowazek, PhD
University of Houston Victoria

Brion Oaks
American Heart Association

Velma Ortega
Texas Department of State Health Services

Jane Osmond, MPH, RRT
Texas Department of State Health Services

Terri Pali
Texas Public Health Association

Kinnie Parker
Nacogdoches Memorial Hospital

Reuben Parrish
Texas Department of State Health Services

Linda Jo Perez, RN, MSN
Laredo ISD

Mark Perry
Houston Department of Health
and Human Services

David Persse, MD
City of Houston EMS

Amy Plotts
St. Joseph Regional Health Center

Ann Quinn Todd
The Methodist Hospital

Edward Racht, MD
City of Austin/Travis County EMS System

Larry Rascon, EMTP
El Paso Fire Department

Marissa Rathbone
Texas Education Agency

Nancy Ray
University Health System

Daniel Reimer
City of Fort Worth, Public Health Department

Holly Riley
Department of Aging and Disability
Services (DADS)

Susan Ristine
Texas Department of State Health Services

George Roberts, Jr.
Northeast Texas Public Health District

Rex Robinson
Methodist Health System of Dallas

Annette Rodriguez, MPH
Corpus Christi Nueces County
Public Health District

Joel Romo
American Heart Association

Elizabeth Ann Roque
American Heart Association

Patsy Rubio
Cano Houston Department of Health
and Human Services

Vanessa Ross
Texas Department of State Health Services

Juanita Salinas
Texas Department of State Health Services

Bobby Schmidt, MEd
Texas Department of State Health Services

Mark Schoeberl, MPA
State Advocacy and Public Health
American Heart Association

Richard Schoel
Midland Memorial Hospital

Rick Schwertfeger
Austin Travis County Health and
Human Services

Johanna Sharp, MSN, RN
University Health System

Kathy Shields
San Antonio Metropolitan Health District

Martha Simien, M.Ed.
City of Port Arthur Health Department

Dan Smith, MEd, CHES
Texas Department of State Health Services

Jennifer Smith, MSHP
President, Texas Public Health Association

Gino Solla
Ector County Health Department

Mary Somerville
Texas Department of State Health Services

Ruth SoRelle
Baylor College of Medicine

Brett Spencer
Texas Department of State Health Services

Stephanie St. Germaine
Midland Memorial Hospital

Sandra Steigerwald, MPH, BSN, RN
Gateway to Care

Teressa Stephenson
Wichita Falls-Wichita County
Public Health Department

Glenna Stewart, MA, CHES
Texas Department of State Health Services

Suzanna Summerlin
American Heart Association

Erica Swegler, MD
Texas Council on Cardiovascular Disease
and Stroke

Thomas Tenner, Jr., PhD
Texas Tech University Health Science Center

Michelle Thomas
City of San Antonio

Kelly Thompson
Waco-McLennan County
Public Health District

Linda Tolson, RN
Andrews County Health Department

Elicia Traylor
Texas Department of State Health Services

Len Trevino
San Antonio Metropolitan Health District

Catherine Troisi, PhD
Houston Department of Health and
Human Services

Stephanie Uecker
Texas Department of State Health Services

Kathy Usher
Schering-Plough

Adolfo Valadez, MD
Texas Department of State Health Services

Maria Velasco
DHHS/US Food and Drug Administration

Sherry Wachtel
Christus Spohn Hospital

Penny Wheat
Texas Round Up

Anita Wheeler
Texas Department of State Health Services

Debbie White, BS
Waco-McLennan County
Public Health District

Susan Whittenberger
City of Fort Worth

Sherry Williams
Waco-McLennan County
Public Health District

Maricela Wilson
Seton Family of Hospital

Michael Wilson
DADS-Board Representative

Jerry Wilson, PharmD
Sanofi-Aventis

Crystal Wiltz, PhD
Cooperative Extension Program
Prairie View A & M

Carol Winick
American Heart Association

Susan Young
Texas Department of State Health Services

Janna Zumbrun
Texas Department of State Health Services

Texas Heart Disease and Stroke Prevention System Partnership

Texas Council on Cardiovascular Disease and Stroke

**Cardiovascular Health and Wellness Program
Adult Health and Chronic Disease Group
Chronic Disease Prevention Branch
Texas Department of State Health Services
www.dshs.state.tx.us/wellness**