

Mississippi State Plan
For
Heart Disease and Stroke
Prevention and Control
2004 - 2013

Mississippi State Department of Health

**Mississippi Chronic Illness Coalition-CVD Advisory
Committee**

**Mississippi Task Force on Heart Disease and Stroke
Prevention**

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Executive Summary

In Mississippi, cardiovascular disease (CVD) is the leading cause of death, accounting for 41 percent of all deaths (11,557) in 2001. Mississippi's CVD mortality is the highest in the nation.

Recently, a synthetic approach to improving health outcomes has been identified that recognizes the complex interplay of individual and social environmental or contextual parameters that generate health outcomes. This approach, the social ecological model, offers possibilities for a new call to action to improve CVD health outcomes at multiple levels in the state of Mississippi.

Using this model as a framework for action, Mississippi aims to improve the state's CVD report card by:

- Enhancing collaborations and partnerships among key constituencies at all levels;
- Implementing program services that encourage healthy communities;
- Increasing public awareness of CVD risk factors, disease management, and early recognition and response to acute events; and
- Impacting policies that build healthy lifestyles and communities.

The foundation of *The Mississippi State Plan for Heart Disease and Stroke Prevention and Control (Plan)* is identifying key socio-cultural influences on CVD that are specific to each target community and implementing multi-level interventions to improve health and overcome health disparities in those communities. Socio-cultural influences include age; gender; ethnicity; economics; education; and community resources, risk factors, and barriers.

In addition to implementing population-wide primary and secondary prevention efforts, as well as tertiary care to those with known CVD, Mississippi recognizes that targeting strategies to selected priority groups can increase the effectiveness of the overall CVD effort and help reduce the disparities in health behavior and status evident in the state. In particular, high risk population groups are identified as those with less education and lower income, those who may have less access to appropriate and affordable health care, who pursue lifestyles that lead to risk factor elevations, and who are members of minority groups that experience discrimination. Of special concern in Mississippi are people with lower socioeconomic status, living in rural areas or under-served counties, women, and African Americans.

Mississippi plans to address CVD risk factors in a two-fold approach: prevention of potential risk factors and management of existing risk factors. Risk factors addressed with the prevention approach include the lack of regular physical activity, improper nutrition, and tobacco use. Increasing physical activity and proper nutrition can prevent many of the other risk factors. Reducing tobacco use will also contribute to reducing high blood pressure and high cholesterol.

The second approach is to manage existing risk factors such as obesity, diabetes, high blood pressure, and high blood cholesterol. While the hope is to prevent cardiovascular disease through lifestyle changes, programs and interventions must be developed to deal with the population that does acquire these risk factors.

The goals of the *Plan* are to:

- Increase the proportion of Mississippians who are physically active;
- Increase the proportion of Mississippians who consume a heart-healthy diet;
- Decrease the number of Mississippians who use tobacco products;
- Identify and address the socio-cultural factors that impact cardiovascular health;
- Identify and reduce health disparities in CVD in target communities;
- Increase awareness of high blood pressure as a risk factor for CVD;
- Reduce the proportion of Mississippians who have uncontrolled high blood pressure;
- Increase awareness of obesity as a risk factor for CVD;
- Reduce the proportion of Mississippians who are classified as obese (BMI \geq 30);
- Increase the proportion of Mississippians who get their cholesterol checked and are addressing problems with high cholesterol;
- Decrease the proportion of Mississippians with an elevated total cholesterol;
- Increase awareness of diabetes as a preventable and/or treatable risk factor for CVD;
- Improve diabetes care and patient self-management behaviors to reduce chronic complications of diabetes;
- Increase the survival rate from cardiac arrest, heart attack, and stroke in Mississippi.

The Mississippi State Cardiovascular Health Program will implement the *Plan* by collaborating with the Task Force on Heart Disease and Stroke Prevention, community-based organizations, voluntary agencies, and grassroots organizations. Pilot projects that reflect the needs of the community will be implemented in various regions of the state. The strategies will include utilizing community health workers, developing media packets for distribution, promoting health education campaigns, and educating communities about policy and structural influences on health. These strategies will be evaluated for their effectiveness and likelihood of replication in similar communities. Pilot projects will be implemented in target communities based on geographic information system (GIS) data projects and existing data that show the need for tailored interventions.

Monitoring and evaluation is a central component of the *Plan*. The purpose of the evaluation is to determine how well the stated objectives were met and to document strengths and weaknesses of the *Plan's* strategies for making future decisions, future planning, and restructuring. Evaluation of the *Plan* will consist of process and outcome evaluations. The evaluation will be an ongoing process to determine the effectiveness of strategies. Initially, the evaluation process will focus mainly on process since the outcome measures – mortality and morbidity – are long range. The process evaluation will answer the questions: “What was actually done?”, “How was it done?”, “When was it done?”, “For whom was it done?”, and “By whom was it done?” to ensure that interventions are implemented as stated in the *Plan*. The outcome evaluation will attempt to determine the congruence between performance (what occurred) and objectives (what was supposed to occur). It will answer the question: “Was the *Plan* effective?”. The outcome evaluation will be designed to examine the long-term effects of the *Plan* in terms of morbidity and mortality rates.

Introduction

Development of the Plan

The Mississippi Cardiovascular Health Program began in September 1998 with funding from the Centers for Disease Control and Prevention (CDC). The Mississippi State Department of Health formed a committee of external and internal partners to begin laying the foundation for a comprehensive plan for cardiovascular health promotion and disease prevention and control in Mississippi.

The advocacy committee of the American Heart Association, Mississippi Affiliate, successfully lobbied for the creation of the Mississippi Task Force on Heart Disease and Stroke Prevention by the 2001 Legislature. This task force, composed of 17 members representing various health-related state agencies, professional associations, the State Legislature, and non-profit educational organizations, was asked to study heart disease and stroke in Mississippi and develop a comprehensive plan of action to reduce cardiovascular disease in the state.

The table below lists the activities related to the development and implementation of the *Mississippi State Plan for Heart Disease and Stroke Prevention and Control*:

Activity	Comments	Status
The Mississippi Chronic Illness Coalition (MCIC)	Formed in the fall of 1996 to improve the long-term health of Mississippians and help reduce the impact of chronic health conditions affecting the state	Activities ongoing
Mississippi Cardiovascular Health Program	Funding received in September 1998	Activities ongoing
MCIC, Cardiovascular Advisory Committee	Introductory meeting held on June 22, 2000, to begin laying the foundation for a comprehensive ten-year CVD state plan	Completed
Specific goals and objectives for CVD prevention in Mississippi	Defined by the MCIC CVD Advisory Committee between 2000 and 2001	Completed
Task Force on Heart Disease and Stroke Prevention	Created by the 2001 Mississippi Legislature	Activities ongoing
MCIC <i>Know Your Numbers</i> statewide community-based prevention campaign	Campaign focuses on four numbers everyone must know for a better life (cholesterol, glucose, blood pressure, and BMI); began in August 2001 with the creation of brochures, posters, mail-out inserts, and public service announcements; expanded in 2003 to train presenters to give a standardized power point presentation created for public audiences	Activities ongoing
Finalization of the CVD state plan	Final plan complete in the summer of 2004	Activities ongoing
Implementation and expansion of the CVD state plan	Includes distribution of the finalized state plan to all related statewide organizations	Future activities

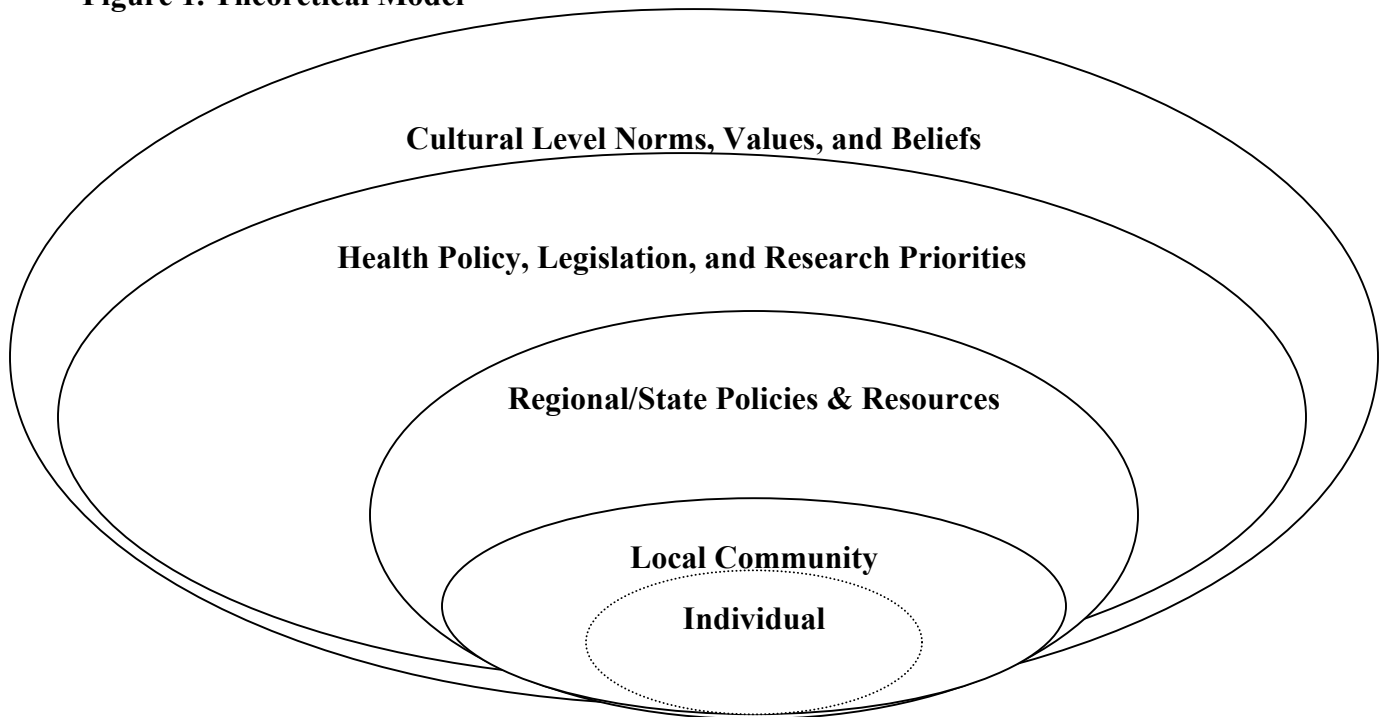
Model for Action

Methods for addressing and improving cardiovascular health outcomes have generally focused on either the individual or the community/society as the basis for action. Individual approaches aim to alter specified lifestyle parameters or to treat persons stricken with acute signs and symptoms of cardiovascular disease (CVD). This approach has targeted high-risk persons for screening, awareness, and education related to CVD. While this approach is to some degree successful, individual behavior change alone is insufficient to curb the tide of CVD deaths in this and other states. Population approaches have evolved that aim to look “upstream” at the underlying causes of the disease. By reducing the level of risk in the total population, a substantial number of additional lives can be targeted and saved. Recently, a synthetic approach to improving health outcomes has been identified that recognizes the complex interplay of individual and social environmental or contextual parameters that generate health outcomes. This approach, the social ecological model, offers possibilities for a new call to action to improve CVD health outcomes at multiple levels in the state of Mississippi.

Social-Ecological Model

A social ecological model concomitantly considers both the individual and her or his environment at several levels in preventing or treating poor health. Individual health behavior does not occur in a vacuum; it is shaped and reinforced by the personal, physical, and social context of multiple life domains. This model draws attention to the domains of individual and community life, including larger macrolevel phenomenon that may influence local contexts, in developing site-specific and culturally competent “interventions” to improve health outcomes. Specifically, four systems are viewed as nested within one another with the individual at the center. These four systems are the micro-, meso-, exo-, and macro-system levels. At the micro level, the specific community and its immediate adjacent area are considered. The meso level involves other nearby communities in a region as well as the state and regional structures that support it. The exo level includes national resources, organizations, and structures responsible for policy, legislation, and research priorities. Finally, the macro level incorporates the total system of cultural beliefs and values relevant to health care that influence all other levels (Shreffler, 1996).

Figure 1. Theoretical Model



Within this model, the smallest unit is the individual, and ultimately it is the individual that implements or fails to implement health promotion and disease prevention actions. However, individual behavior is determined by a multitude of contextual factors at each level of the social environment that are largely outside individual control. Thus, risk factors and barriers to changing health outcomes are shared at each level of “community” — local, regional/state, national, and cultural. As barriers are lowered in these environmental contexts, individual health behavior change becomes more achievable and sustainable. The core theme of the model, highlighting the dynamic relationship between people and their contextual surroundings, can be used to explain the etiology of CVD and provide a basis for generating broad-based educational, therapeutic, and policy interventions to enhance personal and community well-being (Stokols, 2000).

Using this model as a framework for action, Mississippi aims to improve the state’s CVD report card by:

- Enhancing collaborations and partnerships among key constituencies at all levels;
- Implementing program services that encourage healthy communities;
- Increasing public awareness of CVD risk factors, disease management, and early recognition and response to acute events; and
- Impacting policies that build healthy lifestyles and communities.

We also recognize that the very strength of the social ecological model is simultaneously one of its major criticisms. Its breadth in including multiple interacting domains generates issues in concentrating on any one domain for targeted interventions. To address this criticism, we are

adopting the perspective of “leverage points” (Graywacz & Fuqua, 2000) to provide a mechanism for focusing attention on those individual, social, and physical characteristics that are most likely to exert a disproportionate influence on CVD health outcomes. Specifically, we have identified socio-structural (demographics, socioeconomic status), psychosocial and physical (family, work, school, and health care microsystems and their interactions), and individual (health behaviors and beliefs) parameters to focus or leverage the actions identified in this *Plan* toward specified priority populations.

A community-driven approach to identifying key issues, mobilizing resources and strategies for addressing identified issues, implementing community-specific interventions, and evaluating outcomes is articulated in the Action Plan that follows. Actions are seen as initiating at the community and state level to address risk factors for CVD statewide and to reach priority populations employing multi-level interventions to improve health. Outcomes are anticipated for both individuals as well as local, regional, state, and national contexts.

A Call to Action

The foundation of *The Mississippi State Plan for Heart Disease and Stroke Prevention and Control (Plan)* is identifying key socio-cultural influences on CVD that are specific to each target community and implementing multi-level interventions to improve health and overcome health disparities in those communities. Socio-cultural influences include age; gender; ethnicity; economics; education; and community resources, risk factors, and barriers.

The Governor and Legislature of Mississippi charged the Mississippi Task Force on Heart Disease and Stroke Prevention with addressing ways and means to reduce the current and future burden of CVD for the state’s population. This CVD State Plan was initiated by calling together the numerous resources available for both acute management and treatment of disease as well as health promotion and disease prevention services across the state. Assuring broad participation is viewed as central to generating and enacting a successful state plan. The *Plan* recognizes these myriad resources and intends to capitalize on their collective capacity while enhancing partnerships among these resources and citizens in target communities to join forces toward building healthy communities in which healthful conditions become the norm.

Mississippi’s *Plan* incorporates strategies that promote both primary and secondary prevention in an effort to increase the numbers of Mississippians who engage in CVD prevention practices. Strategies that utilize an array of venues have been selected in keeping with community health intervention research which has shown there is no one specific intervention strategy that is effective within all populations and communities (Anderson, 1997; Dobs, 1994; Mittlemark, 1993). The *Plan* recognizes community environments such as schools, faith-based organizations, and civic groups as necessary entities for achieving our goals. Successful African American faith-based health programs, such as “Lighten Up” (Oexmann, 2000), show the effectiveness of integrating religion and health in this population. School-based programs have also shown primary prevention successes (Nicklas, 1997; Perry, 1997).

In addition, worksites, because they represent a large sector of the population, serve as effective avenues for encouraging positive health practices. Worksite interventions have the added incentive of responding to employer needs, as they promote habits that reduce absenteeism, reduce employers' health care costs, and improve corporate image (Beresford, 2001).

Health care providers and health care organizations, though obvious sources of any health intervention, have not shown considerable success in the delivery of preventive health services (Aita, 2000). This *Plan* identifies strategies that encourage the health industry to focus on maintenance of health in addition to the control and treatment of disease.

The Stanford Five-City Project (Farquhar, 1990) and the Pawtucket Heart Health Program (Carleton, 1995) are two of the most notable evaluations of the effect of community-wide health intervention on CVD risk factor reduction. The results emphasize that positive risk factor changes will require sustained reinforcements at the community, state, and national levels and the intervention plan should incorporate policy changes and program development. It is thus through community, worksite, and health organization venues that our strategies of collaboration and partnerships, program services, public awareness, and policy will be employed to implement the *CVD Plan*. This use of multi-channel delivery systems is supported in the risk reduction effectiveness findings of the Stanford Five-City Project (Fortmann, 1993).

Mississippi has a successful history of collaborating and coordinating public health efforts. **Building new collaborations** across multiple sectors that link local, state, and national organizations is essential to overcoming the burden of CVD in vulnerable Mississippi communities. By identifying existing resources and working with resource agencies that have common health outcome goals, ideas can expand and duplication of development efforts can be eliminated. For example, bringing together faith-based groups, service organizations, transportation, business organizations, and economic development organizations with traditional public health resources and individual citizens in target communities offers expanded opportunities for collaboration. The Mississippi Chronic Illness Coalition is one of the largest and most recent examples of a collaborative and coordinated health effort in Mississippi. The successful implementation of this *Plan* is dependent upon broad-based collaboration and coordination of individual local resources with regional, state, and national level organizations and opportunities.

Examples of **program services** that emanate from such new partnerships include establishing new ways to deliver health information and services at the community level. The creation of toolkits will serve to standardize the program services, including those for lay health advisor trainings and the health care providers' practice guidelines. For example, implementing lay or community health advisor programs with local citizens in target communities could jump-start community programming for reducing risk factors and **improving public awareness** of risk factors and early identification and treatment. Media, printed education materials, and speakers' bureaus have been identified as effective communication tools (Connell, 2001; Green, 2002). Other changes in community, worksite, school, and health care policies to support individuals in adopting healthier behaviors might include town planning efforts to enhance walking trails, worksite and school programs for physical activity or *Know Your Numbers*, restaurants that include low-cost healthy food choices, and **policies** to promote wider access to health care.

A key goal of all actions will be creating community sustainability by building community capacity through establishing CVD priorities, planning interventions based on existing community assessments complemented by new data as needed, collaborating with groups who may share goals (ministerial alliances, restaurants, businesses), and engaging existing resources and coalitions within the local, regional/state, and national levels. Working with these communities, state-level coalitions and councils will work toward legislative and organizational change that supports the efforts of local communities to implement policy strategies.

The implementation of the strategies listed in this *Plan* will require additional resources and enhanced collaboration of existing resources. The Mississippi Chronic Illness Coalition has begun to facilitate the collaboration of more than 100 agencies and organizations related to chronic illness prevention, management, and surveillance. The Coalition, along with the Task Force on Heart Disease and Stroke Prevention, the Mississippi State Department of Health, the American Heart Association, and others, have the shared mission of reducing cardiovascular disease.

Legislation passed in the 2001 session of the Mississippi Legislature created the Task Force on Heart Disease and Stroke Prevention to formalize collaboration and coordination of efforts related to cardiovascular disease reduction. The Task Force is charged with adopting a state plan of action, bringing together stakeholders, promoting strategies, and defining quality care. The Task Force will promulgate recommendations for cardiovascular disease prevention in accordance with the *Plan*. Additionally, the Task Force has identified a specific goal of developing a statewide database on cardiovascular disease risk factors for the purpose of better prevention, health promotion, and surveillance. Information on the prevalence of hypertension, elevated cholesterol, glycemia, and obesity currently relies on self report through the Behavioral Risk Factor Surveillance System annual survey. This data base or CVD Risk Factor Registry is one of the specific additional resources required by the *Plan*. Funding will be sought for developing a state-wide mechanism to register population parameters, thus allowing more accurate ascertainment of risk factors. Obtaining population specific risk factor data will begin in the designated target communities (e.g. the Morton Have a Heart Program and the Mercy Delta Express Project, among others) where *Know Your Numbers* campaigns will allow for determination and recording of risk factor data with subsequent follow up to ascertain change following community interventions.

In addition to the Coalition and the Task Force, other partners will continue to provide resources and advocacy. The American Heart Association (AHA), the Mississippi Alliance for School Health, the Partnership for a Healthy Mississippi, and other organizations can and will contribute in various ways. The AHA has played a key role in working with legislators and experts to develop public policy that addresses health promotion, disease prevention, public awareness, and resource allocation. The AHA and other partners will continue to advocate for policies and resources to achieve the strategies outlined in this *Plan* by providing research and data, building grassroots support for heart-healthy initiatives, and, in some cases, providing financial or material contributions.

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Model for Action

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Cardiovascular Disease in Mississippi

Cardiovascular disease (CVD), encompassing both coronary heart disease and stroke, is defined as a disease of the heart and blood vessels (arteries, veins, and capillaries). Cardiovascular disease is the nation’s leading killer for both men and women among all racial and ethnic groups.

In Mississippi CVD is the leading cause of death, accounting for 41 percent of all deaths (11,557) in 2001 (Table 1). Mississippi's CVD mortality is the highest in the nation. More Mississippians die each year from CVD than from all types of cancer, traffic injuries, suicides, and AIDS combined. A substantial number of these deaths are premature: one in five CVD deaths in 2001 occurred in Mississippians under 65 years old. In 2001 the prevalence of coronary heart disease and stroke for Mississippi adults was 4.3 percent and 2.4 percent, respectively. More than 160,000 Mississippians reported a history of CVD.

Table 1. Leading Causes of Death in Mississippi, 2001

Cause of death	% of all deaths
CVD	41.0
Cancer	21.0
Injuries	6.0
Lung Disease	5.0
Pneumonia/Flu	3.0
Diabetes	2.0
Kidney Diseases	2.0
Septicemia	2.0
Alzheimer's	2.0
Other	16.0

Mississippi’s CVD mortality rate has remained the highest in the nation for many years. In 2001 (the latest year for which comparable national data are available), Mississippi’s CVD mortality rate was 31.2 percent higher than the national rate (426.5 vs. 325.2).

Coronary heart disease (CHD) and *stroke* are the two most common forms of CVD. In 2000, Mississippi ranked seventh in the nation in death rates from CHD and sixth in death rates from stroke.

Stroke Facts

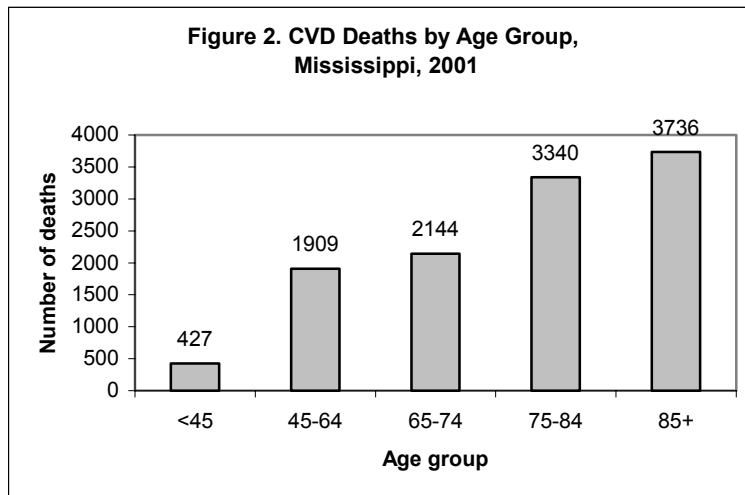
- Stroke alone is the third leading cause of death in Mississippi, accounting for 6.8 percent of all deaths in 2001, when 1,927 Mississippians died from stroke.
- The exact incidence of stroke in Mississippi is unknown, as the state has no stroke registry or statewide hospital discharge data system. A very rough estimate is that more than 5,000 Mississippians suffer a stroke for the first time each year. Approximately one-third of victims die; one-third become disabled; and one-third recover. Another 2,000 suffer a recurrent stroke each year.
- Mississippi is one of 11 states in the southeast region of the country known as the “Stroke Belt”. For at least 50 years, this region has experienced higher stroke death rates than

other parts of the United States.

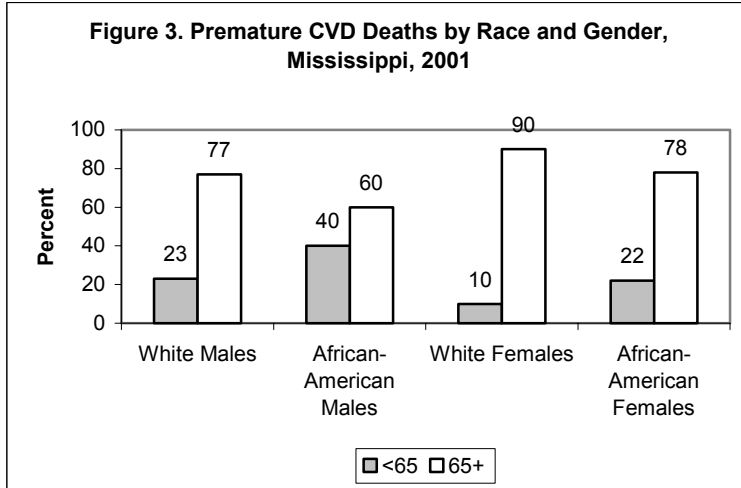
- The risk of stroke doubles with each succeeding decade after the age of 55. However, in 2001 nearly one in five stroke deaths in Mississippians occurred under 65 years of age.
- Premature mortality due to stroke is greater for men than women and for African Americans than whites. The largest amount of premature stroke mortality occurs in African American men: 39 percent of all stroke deaths in this group occurred before age 65.
- Stroke mortality rates in Mississippi have declined, but remain significantly higher than national rates. In 2000, Mississippi's stroke death rate was 22 percent higher than the U.S. rate (74.0 vs 60.8).
- Rates in all population groups now appear to be leveling off.

Overall CVD Facts

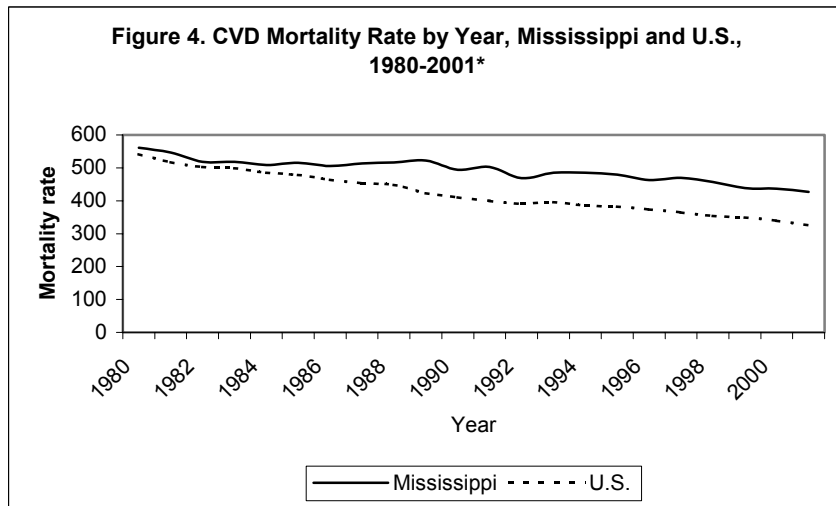
- CVD is uncommon before middle age. CVD death rates increase steeply after age 45; however, one in five CVD deaths occurred in Mississippians under 65 years old in 2001 (Figure 2).



- This premature mortality due to CVD is greater for men than women and for African Americans than whites. The largest amount of premature CVD mortality occurs in African American men: 40 percent of all CVD deaths in this group occurred before age 65 (Figure 3).



- CVD death rates in Mississippi have fallen, but not as much as rates in the rest of the nation: national rates are declining more than twice as fast as rates in Mississippi (Figure 4).



*Age adjusted to the 2000 U.S. population.

- Age-adjusted CVD mortality rates show a wide variation from county to county, ranging from 574.4 per 100,000 (Claiborne) to 333.3 per 100,000 (Prentiss), a difference of 72 percent. Claiborne County's rate is 32 percent above the state average. Thirty-four (34) of the state's 82 counties have CVD mortality rates that are statistically significantly higher than the state's overall rate. The top ten counties with the highest CVD mortality rates are, in descending order, Claiborne, Leflore, Tunica, Tippah, Stone, Grenada, Holmes, Wilkinson, Tishomingo, and Bolivar. Such wide variation between counties is largely the result of environmental influences (social, economic, and cultural factors) on the incidence of, and mortality from, CVD, and emphasizes the need for prevention at all levels to reduce these differences. This becomes even more urgent when trend data are examined: compared to 1996-98, twenty-five (25) counties had CVD mortality rates in 1999-2001 that actually increased, by up to 26 percent.
- It is not known whether Mississippi's high CVD mortality rates are due to high incidence (more new cases of CVD), more severe disease, poorer survival of persons with CVD, or some combination of these factors. Further decreases in CVD mortality rates will not be achieved unless racial/ethnic and geographic disparities are reduced. Also, primary prevention needs to be emphasized very strongly to reduce the prevalence of CVD risk factors in the population: more Mississippians need to stop smoking, become more active, lose weight, control their blood pressure, eat a healthier diet, and lower their blood cholesterol level. Currently, three-fourths of Mississippians have at least one CVD risk factor.
- The economic impact of CVD on the Mississippi health care system continues to grow as the population ages. Of all states, Mississippi has the fifth-highest percentage (22 percent) of adults aged 18-64 reporting no health care coverage. The estimated cost of CVD in Mississippi in 2001 was about \$3.7 billion. This cost includes health care expenditures and lost wages. The largely preventable nature of CVD makes the deaths, disability, and costs attributable to this disease more tragic.

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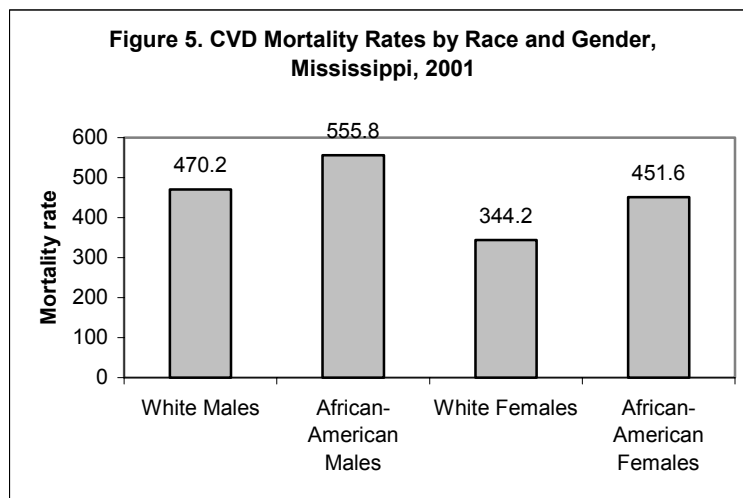
Cardiovascular Disease in Mississippi:

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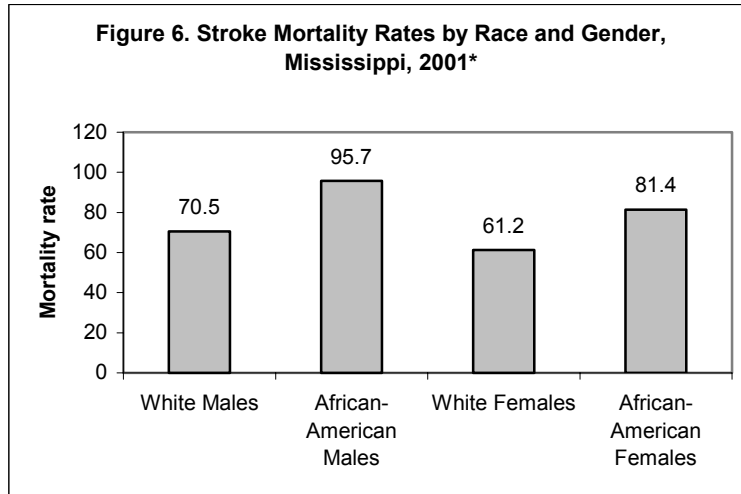
Priority Populations

In addition to implementing population-wide primary and secondary prevention efforts, as well as tertiary care to those with known CVD, Mississippi recognizes that targeting strategies to selected priority groups can increase the effectiveness of the overall CVD effort and help reduce the disparities in health behavior and status evident in the state. In particular, high risk population groups are identified as those with less education and lower income, those who may have less access to appropriate and affordable health care, who pursue lifestyles that lead to risk factor elevations, and who are members of minority groups that experience discrimination. Of special concern in Mississippi are people with lower socioeconomic status, living in rural areas or under-served counties, women, and African Americans. Within this subset of persons, another group of note are those with underlying medical conditions that predispose them to heart disease and stroke, particularly those with high blood pressure, high cholesterol, obesity, and diabetes.

Overall CVD death rates differ by racial/ethnic group, gender, and age: African Americans have higher rates than whites, and men have higher rates than women (Figure 5). In 2001, CVD death rates were 18 percent higher for African American men than white men, and 31 percent higher for African American women than white women. African American males and females in Mississippi have maintained more or less level CVD death rates since the early 1980's, resulting in a growing disparity in CVD mortality rates between whites and African Americans in the state. A similar disparity exists in stroke mortality, with stroke death rates in 2001 being 36 percent higher for African American men than white men, and 33 percent higher for African American women than white women (Figure 6).



*Age adjusted to the 2000 U.S. population.



*Age adjusted to the 2000 U.S. population.

Contributing to the need to address priority populations in Mississippi are factors such as education, poverty, and access to quality health care. The social nature of these factors limits the inclusion of any significant intervention strategies within the *CVD Plan*; however, identification of the magnitude of the problems and recognition of their contribution to the disparities in CVD mortality will assist in the development of strategies to address the needs of these populations.

Poverty

The availability of resources that aid in the practice of healthy lifestyles is largely determined by one's income. Results of the 2000-2002 Annual Demographic Supplements to the U.S. Census Bureau, Current Population Survey, indicate that in the period from 2000-2001, 17.1 percent of Mississippians lived in poverty. This represents a 1.5 percent increase from the 1999-2000 period. Mississippi is far above even the overall South's rate of 13.5 percent for the 2000-2002 period. Because of the association of health outcomes with economic status (Kaplan, 1993), priority attention to Mississippi's large population of poverty-stricken citizens is well founded.

Education

Both educational attainment and economic status have a significant impact on one's ability to acquire the resources necessary to ensure the practice of healthy living. In addition, an individual's educational status can determine his ability to understand the association of healthy living with good health outcomes. Furthermore, under-education can impair one's ability to comprehend medical information pertinent to his health (Gazmararian, 1999). Barriers posed by lack of adequate education will be addressed in this *Plan*.

U.S. Census Bureau data from 2000 reveal that among Mississippi's population 25 years and over, 9.6 percent had less than a ninth grade education, 27.1 percent had less than a high school degree, and 83.1 percent had less than a bachelor's degree.

Access To Care

Education and economic factors, coupled with geographic isolation, contribute to the problem of access to care. As of January 2004, 64 of Mississippi's 82 counties or portions of counties were designated as health professional shortage areas for primary care. In addition, an estimated 47 percent of Mississippi's citizens lacked access to a primary care provider. This fact further adds to the poor health outcomes of an already at-risk population. Rural areas, particularly those with a high concentration of poor African Americans (the Mississippi Delta), often have very poor health care infrastructures.

Risk Factor Disparities

Because the prevalence of many of the CVD risk factors is greater in certain populations – most being greater in African Americans compared to whites (Wyatt et al., 2003) and for obesity and diabetes, greater in women compared to men – some priority concentration on African Americans and women is merited.

According to the Third National Health and Nutrition Examination Survey, hypertension is nearly 40 percent greater in blacks than whites (Burt, 1995), and its sequelae are more frequent and severe in blacks. Nationwide the prevalence of diagnosed diabetes among blacks from 1988 to 1994 was 18.2 percent, whereas it was 11.2 percent among whites (Harris, 1998). The prevalence of overweight and obesity combined is greatest in African American, Hispanic, and Native American women, with 66 percent of them falling in the overweight or obese categories. The prevalence of obesity, however, is greatest in African American women (37 percent) than in any of the other groups.

To reduce these disparities among ethnic/racial, socioeconomic, and geographical populations, approaches utilized in the general population will require special tailoring and intervening, and must be effectively and appropriately employed.

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Prevention and Management of Cardiovascular Disease Risk Factors

To affect the burden of heart disease and stroke in Mississippi, programs must reduce the incidence of preventable risk factors: lack of regular physical activity, improper nutrition, high blood pressure, high blood cholesterol, obesity, tobacco use, and diabetes. Currently, 84 percent of the adult population has one or more of these risk factors. In addition, 2.8 percent have the “deadly quartet”: high blood pressure, high cholesterol, diabetes, and obesity.

Mississippi plans to address these risk factors in a two-fold approach: prevention of potential risk factors and management of existing risk factors. Risk factors addressed with the prevention approach include the lack of regular physical activity, improper nutrition, and tobacco use. Increasing physical activity and proper nutrition can prevent many of the other risk factors such as obesity, diabetes, high blood pressure, and high blood cholesterol. Reducing tobacco use will also contribute to reducing high blood pressure and high cholesterol.

The second approach is to manage existing risk factors. While the hope is to prevent cardiovascular disease through lifestyle changes, programs and interventions must be developed to deal with the population that does acquire these risk factors. These risk factors include hypertension, obesity, abnormal cholesterol, and diabetes. The plan also discusses socio-cultural factors that influence cardiovascular health.

For each risk factor the *Plan* includes 10-year objectives to achieve the stated goals and addresses specific actions needed in the community environment, worksites, and healthcare settings. For each setting, the *Plan* develops strategies based on collaborations/partnerships, program services, public awareness, and policies. The *Plan* discusses implementation of the strategies and evaluation in later sections.

Physical Inactivity

Regular physical activity is associated with a healthier, longer life. Physically active people have a lower risk of heart disease, high blood pressure, diabetes, obesity, and some types of cancer than less active people. Therefore, a need exists for effective population-based interventions to promote increased physical activity. Although vigorous physical activity is recommended for cardiorespiratory fitness, even moderate levels of physical activity can have significant health benefits (*Healthy People 2010*). Physical activity does not need to be strenuous to achieve health benefits; people who are inactive can improve their health and well-being by becoming even moderately active on a regular basis. Even greater health benefits can be achieved by increasing the amount (duration, frequency, or intensity) of physical activity. (*Surgeon General’s Report on Physical Activity and Health, 1996*).

Physically inactive people are almost twice as likely to develop coronary heart disease (CHD) as people who engage in regular physical activity. The CHD risk from physical inactivity is almost as high as that from cigarette smoking, high blood pressure, and high cholesterol; and physical inactivity is more prevalent than any of these other risk factors (*Healthy People 2010*).

Physical Inactivity

Goal: Increase the proportion of Mississippians who are physically active.

Objectives

By 2013:

- Decrease the proportion of persons 18 and older who engage in no leisure time physical activity from 33 percent (2002) to 25 percent (BRFSS).
- Increase the proportion of youth who report participating in vigorous physical activity on at least five of the past seven days:
 - a. in high school students from 53 percent (2003) to 66 percent (YRBS);
 - b. in middle school students from 61 percent (2003) to 66 percent (YRBS).
- Increase the proportion of youth who report participating in physical education on at least three days a week:
 - a. in high school students from 27 percent (2003) to 33 percent (YRBS);
 - b. in middle school students from 56 percent (2003) to 61% (YRBS).
- Increase the proportion of persons 18 and older who report being told by a physician to engage in physical activity from 35 percent (2002) to 45 percent (BRFSS).

Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
1. Increase support for physical activity in the community environment (e.g. schools, faith-based, civic).	1. Establish linkages between individual community groups and regional/state/national organizations and coalitions. 2. Create and disseminate a community toolkit of resources for utilization by community based collaborations and partnerships.	1. Establish programs to develop community and neighborhood initiatives that encourage physical activity. 2. Implement the Community Health Advisor Network program in target communities. 3. Implement grade-specific physical activity programs such as <i>Take 10</i> and <i>Heart Power</i> that incorporate physical activity as part of classroom activity. 4. Create and disseminate a community toolkit of programs for utilization by community and neighborhood initiatives (e.g. <i>Search Your Heart</i> , <i>WISEWOMAN</i> , and <i>Hearts and Parks</i>).	1. Utilize community media outlets to provide physical activity cues and messages. 2. Create and disseminate a media toolkit for use by communities in providing physical activity cues and messages (bulletin inserts, public service announcements, signage, press releases, closed circuit television, speakers bureau. 3. Provide local communities with the Governor's Commission on Physical Fitness and Sports physical activity report cards.	1. Develop and disseminate a model plan for use by communities in developing environments that support and encourage physical activity. 2. Advocate for mandatory physical education in schools. 3. Support policy initiatives related to physical fitness.

<p>2. Increase the proportion of worksites that promote physical activity for their employees.</p>	<p>1. Identify and contact key personnel in major Mississippi industries to develop ongoing partnerships with regional/state/national organizations and coalitions for implementing CVD prevention activities. 2. Create and disseminate a toolkit of resources for utilization by worksite collaborations/partnerships.</p>	<p>1. Promote and evaluate culturally-relevant worksite physical activity programs (local pilot projects in target communities). 2. Facilitate worksite identification of lay leaders to serve as facilitators of CVD prevention activities, including physical activity. 3. Conduct leader and instructor worksite training sessions in physical activity designed to complement the services/programs offered by the individual worksite. 4. Create and disseminate a toolkit of physical activity programs for utilization by worksite initiatives (e.g modify school-based <i>Take 10!</i> to fit worksites, New York Worksite Wellness Program, <i>WISEWOMAN</i>, and worksite wellness programs).</p>	<p>1. Provide all key worksites with copy of the <i>Mississippi State Plan for Heart Disease and Stroke Prevention and Control</i>. 2. Promote dissemination of <i>Know Your Numbers</i> campaign in worksites. 3. Develop social marketing materials for use by worksites to disseminate information, exercise/physical activity tips, articles, and employee of the month personal “success” stories via newsletters, closed circuit TV, intranet, and other relevant outlets. 4. Utilize the Governor’s Commission on Physical Fitness and Sports to continue to develop physical activity report cards to recognize exemplary worksite physical activity programs.</p>	<p>1. Establish state/local legislation that supports worksite physical activity. 2. Impact organizational policy to assure physical activity friendly workplace environments (e.g. walking trails, bicycle storage, fitness facilities).</p>
<p>3. Increase the capacity of healthcare providers, healthcare settings, and organizations to address physical inactivity.</p>	<p>1. Establish linkages between local health care providers/facilities and local/state/national resources that encourage increased physical activity. 2. Collaborate with peer review organizations. 3. Create and disseminate a toolkit of resources for utilization by health care</p>	<p>1. Provide and promote education to enhance health care provider knowledge of benefits of increased physical activity and the importance of conveying health promotion messages. 2. Provide and promote training of health care providers/facilities on implementing evidence-based</p>	<p>1. Disseminate to health care providers protocol/guidelines/tools for prescribing physical activity regimens. 2. Promote the <i>Know Your Numbers</i> campaign in all Mississippi health care facilities. 3. Develop social marketing materials for use by health care providers and facilities to</p>	<p>1. Encourage implementation of insurance regulations to provide reimbursement for physical activity. 2. Encourage legislation that supports physical activity policy recommendations from key state task forces and councils (CVD, obesity, tobacco, diabetes, arthritis).</p>

	<p>providers, facilities, and organizations.</p>	<p>tools and guidelines, and creating systems to deliver appropriate preventive care (e.g. <i>Put Prevention Into Practice</i>).</p> <p>3. Use the train-the-trainer model to establish an expert resource network (local pilot projects in target communities).</p>	<p>disseminate information, exercise/physical activity tips, articles and personal “success” stories via newsletters, posters, closed circuit TV, and other relevant outlets.</p>	
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Improper Nutrition

Optimal nutrition can help lower the risk of developing chronic diseases and their risk factors. High fat, high sugar, and low nutrient foods are quick, plentiful, inexpensive, and widely available. However, healthy eating is often perceived as being time-consuming, expensive, complicated, and/or unappealing. The trend for increasing portion sizes in restaurants continues, particularly in fast food and convenience stores where high fat foods and high sugar beverages are common. Larger sizes are heavily promoted in advertising and at point of sale. In many cases, these large portions far exceed recommendations of the USDA and FDA (*Young, 2002*).

Research shows that Americans are eating too much food with little nutritional value. High fat, high sodium, high sugar foods are even served in schools on a regular basis. More than 84 percent of children and adolescents eat too much fat and 51 percent eat less than one serving of fruit per day.

Appropriate nutrition is one of the easiest ways to reduce key risk factors for cardiovascular disease such as high blood pressure, high cholesterol, obesity, and diabetes. Population-based strategies must be implemented to address access to food with high nutritional value, to educate the public on the necessity of consuming such foods, and to provide incentives to choose healthier alternatives.

Improper Nutrition

Goal: Increase the proportion of Mississippians who consume a heart-healthy diet.

Objectives

By 2013:

- Increase the proportion of persons 18 and older who eat an average of five or more servings of vegetables and fruits each day from 19 percent (2002) to 25 percent (BRFSS).
- Decrease the proportion of Mississippi high school students who do not eat five or more servings of fruits and vegetables each day from 80 percent (2003) to 60 percent (YRBS).
- Among school age children, reduce by 10 percent those reporting having eaten high-fat items in the previous day (baseline 59 percent chose fatty meats and 68 percent chose french fries or potato chips in 1995 YRBS).

Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
<p>1. Increase support for the consumption of a heart-healthy diet in the community environment (e.g. schools, faith-based, civic).</p>	<p>1. Establish linkages between individual community groups and regional/state/national organizations and coalitions that promote heart-healthy nutritional options (Mississippi Alliance for School Health, Action for Healthy Kids, Cardiovascular Learning Partnership, Mississippi Restaurant Association, Mississippi Dietetic Association, vending machine distributors, e.g. MS Department of Rehabilitation Services Vocational Rehabilitation for the Blind).</p>	<p>1. Establish programs to develop community and neighborhood initiatives that encourage a heart-healthy diet (<i>Search Your Heart</i>, American Diabetes).</p> <p>2. Implement a Community Health Advisor Network program in target communities.</p> <p>3. Implement grade-specific nutrition programs that incorporate a heart-healthy diet as part of classroom curriculum/education (e.g. <i>Heart Power</i>, <i>Changing the Scenes</i>, <i>Organ Wise</i>, <i>Take 10!</i>, Food Pyramid).</p> <p>4. Establish a Partners in Healthy Eating Restaurant Program statewide by certifying and promoting healthy menu items in five restaurants per</p>	<p>1. Utilize community media outlets to provide heart-healthy diet cues and messages.</p> <p>2. Create and disseminate a media toolkit for use by communities in providing heart-healthy diet cues and messages (bulletin inserts, posters, public service announcements, signage, press releases, closed circuit television, speakers bureau).</p>	<p>1. Develop and disseminate a model plan for use by communities in developing environments that support and encourage healthy food choices.</p> <p>2. Advocate for heart-healthy choices in federally and state funded nutrition programs (senior feeding sites, Meals on Wheels, Food Stamps).</p> <p>3. Advocate for nutrition education requirement as a component of obtaining food stamps.</p> <p>4. Support the incorporation of a comprehensive and integrated nutrition curriculum that is continuous from K-12th grade into Mississippi public schools.</p> <p>5. Support policy initiatives</p>

		<p>county in at least 25 counties across the state.</p> <p>5. Create and disseminate a community toolkit of programs for utilization by community and neighborhood initiatives (e.g. <i>Search Your Heart</i>).</p>		<p>related to heart-healthy nutrition (Action for Healthy Kids, 5-A-Day).</p>
<p>2. Increase the proportion of worksites that promote heart-healthy food choices for their employees.</p>	<p>1. Identify and contact key personnel in major Mississippi industries (e.g farming, poultry, timber, construction, food service, manufacturing, and gaming) to develop ongoing partnerships with regional/ state/national organizations and coalitions for implementing heart-healthy nutrition.</p> <p>2. Create and disseminate a tool kit of resources for use by worksite collaborations and partnerships.</p>	<p>1. Promote and evaluate culturally-relevant worksite heart-healthy nutrition programs (local pilot projects in target communities).</p>		

Tobacco Use

Tobacco use, particularly smoking, remains the number one cause of preventable disease and death in the United States. Each year, more than one million young people become regular smokers, and more than 400,000 adults die from tobacco-related diseases. In fact, tobacco dependence is best viewed as a chronic disease with remission and relapse (*Reducing Tobacco Use: A Report of the Surgeon General – 2000*).

Tobacco use results in more than \$50 billion in direct medical costs annually. Smoking kills more people each year than AIDS, alcohol, drug abuse, car crashes, murders, suicides, and fires – combined. Direct medical costs attributable to smoking total at least \$50 billion per year (*Healthy People 2010*).

Approximately 80 percent of adult smokers started smoking before the age of 18, and every day, nearly 3,000 young people under this age become regular smokers. More than five million children living today will die prematurely because of a decision they will make as adolescents – the decision to smoke cigarettes (*CDC website – Tobacco Information and Prevention Source, 2002*).

In addition to tobacco use, environmental tobacco smoke (ETS) exposure remains the third leading cause of preventable death in the United States today. Most state and local laws for clean indoor air reduce but do not eliminate nonsmokers' exposure to ETS (*Reducing Tobacco Use: A Report of the Surgeon General – 2000*). Even with all these astonishing facts, there is evidence that tobacco use in this nation can be reduced through existing types of interventions, in line with health objectives detailed in *Healthy People 2010 (Reducing Tobacco Use: A Report of the Surgeon General – 2000)*.

Benefits of Controlling Tobacco Use

Treating tobacco dependence is particularly important economically, as treatment can prevent a variety of costly chronic diseases, including heart disease, cancer, and chronic lung disease. It has been estimated that smoking cessation is more cost-effective than other commonly provided clinical preventive services, including screening for cervical, breast, and colon cancer; treatment of mild to moderate high blood pressure; and treatment of high cholesterol (*Reducing Tobacco Use: A Report of the Surgeon General – 2000*).

Most smokers become addicted at a young age. In fact, 90 percent of those killed by tobacco started smoking before the age of 18. Therefore, preventing young people from using tobacco will help them to live longer, healthier lives (*The Partnership for a Healthy Mississippi Website - 2002*).

Even for nonsmokers, reduced smoking rates mean a better quality of life. Every year, Mississippi taxpayers foot the bill for an estimated \$320 million tax burden due to tobacco related healthcare costs (*The Partnership for a Healthy Mississippi Website – 2002*).

Tobacco Use

Goal: Decrease the number of Mississippians who use tobacco products.

Objectives

By 2013:

- Reduce the youth smoking rate from 25 percent (2003) to 20 percent (YRBS).
- Reduce the adult smoking rate from 27 percent (2002) to 22 percent (BRFSS).
- Provide tobacco cessation services statewide.
- Increase the proportion of adults who report quit attempts within the last year from 58 percent (2002) to 70 percent (BRFSS).
- Increase the number of smokers that report their health care provider has counseled them on quitting from 61 percent (2000) to 70 percent (BRFSS).
- Increase the percentage of healthcare providers who feel adequately trained to provide cessation counseling by 15 percent (statewide survey of healthcare providers).

Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
<p>1. Increase the number of services provided to prevent smoking or aid in cessation at the community level.</p>	<p>1. Coordinate tobacco activities with existing health, education, and enforcement activities to maximize efficiencies and minimize duplication of efforts. 2. Encourage local businesses to become tobacco free. 3. Support community programs that link tobacco control interventions with disease prevention activities by identifying existing programs and providing resources and training (e.g. <i>Know Your Numbers, Search Your Heart, Is Your Number Up</i>).</p>	<p>1. Provide programs to school-age youth which equip them with knowledge and skills to resist social, environmental, and cultural influences that promote tobacco use. 2. Coordinate school-based tobacco prevention interventions and cessation with families, friends, and community-based organizations (Partnership for a Healthy Mississippi). 3. Support existing cessation treatment programs and address the needs of Mississippi's diverse populations; link programs to populations. 4. Ensure access to cessation services for current users of tobacco through the support of a statewide referral and</p>	<p>1. Prevent tobacco use on school property and at school-related activities by awareness and enforcement of state law and local ordinances through cooperation with local law enforcement agencies and community organizations. 2. Educate communities on the need for tobacco prevention and on the cardiovascular health benefits of cessation through media (Tobacco Education Resource Center, ads, commercials). 3. Support tobacco advertising and promotion restrictions. 4. Support maintenance of the Mississippi media campaign as an identifiable,</p>	<p>1. Promote the adoption of public and private tobacco control policies on a local and state level. 2. Support counties and municipalities in adopting tobacco-free ordinances. 3. Support policy efforts that will decrease the consumption of tobacco products.</p>

		counseling resource.	non-judgmental source of information for youths and adults through multiple messages in multiple executions. 5. Promote available resources for treatment of nicotine addiction.	
2. Increase the number of services provided to prevent smoking or aid in cessation in the worksite setting.	1. Reduce and/or eliminate use of tobacco in workplaces and other public places by working with businesses and trade groups (Mississippi Restaurant Association, Mississippi Gaming Association, Mississippi Manufacturers Association) to encourage voluntary elimination of indoor tobacco use.	1. Support and encourage the use of cessation treatment programs to address the needs of employees (e.g. A Comprehensive Tobacco Program – ACT).	1. Promote available resources for treatment of nicotine addiction in worksites. 2. Educate employers on the need for tobacco prevention and on the cardiovascular health benefits of cessation through media (Tobacco Education Resource Center, ads, newsletters, check stuffers).	1. Promote the adoption of public and private tobacco control policies in worksites.
3. Increase the number of prevention or cessation services provided through healthcare settings.	1. Encourage healthcare organizations to become actively involved in tobacco prevention and treatment.	1. Encourage healthcare providers to incorporate prevention information and activities as part of comprehensive wellness services. 2. Support and promote healthcare provider training sessions on tobacco cessation counseling services and treatments. 3. Encourage healthcare providers to disseminate tobacco cessation materials and provide cessation counseling services/referrals and treatment.	1. Utilize healthcare providers to serve as tobacco prevention and cessation spokespersons. 2. Promote available resources for treatment of nicotine addiction.	1. Support insurance reimbursement for physicians who provide cessation counseling. 2. Support insurance reimbursement for tobacco cessation treatment, including counseling services and medications. 3. Develop and incorporate tobacco-related curricula in all health-related degree programs.

Sociocultural Factors

A variety of factors influence the cardiovascular health of individuals and communities. Fortunately, many of these factors are modifiable, and effective intervention efforts can lead to better prevention and control of cardiovascular disease (CVD). Certain modifiable risk factors, however, are also influenced by behavioral, cultural, and environmental interactions that complicate intervention strategies. These interactions are likely to lead to the health disparities observed in certain minority groups. Although the causes of these disparities are not known, the suggestion that several non-traditional/sociocultural risk factors are contributors is well documented (*Hutchinson, 1997*). Because a large array of risk factor interactions might exist, a comprehensive inclusion in this *Plan* is not practical. Some are, nonetheless, more obvious and better known than others and have been identified in *Healthy People 2010*.

In addition, the Jackson Heart Study Exam Center investigators conducted an extensive review of literature on psycho-cultural and socio-economic influences on CVD within certain populations (*Jones, Taylor, 1998*) when preparing their technical plan for an epidemiological cohort study of CVD in African-Americans in central Mississippi. This Jackson Heart Study research review, along with identification of the *Healthy People 2010* objectives that specifically relate to socioeconomic status and psycho/socio-cultural intervening factors (*Healthy People 2010 2nd edition*) well describe the issues surrounding these factors. In addition, the Mississippi State Department of Health (MSDH) has developed a *Mississippi Health Plan to Eliminate Racial and Ethnic Disparities*, which identifies general strategies and interventions that can be applied to this component of the CVD plan.

Five areas have been defined when attempting to understand the relationships between certain population groups and the biological and environmental/behavioral aspects of the excessive rates of CVD. The Jackson Heart Study socio-cultural work groups refined them to include: (1) culture, racism, and discrimination; (2) socioeconomic status; (3) stress, coping, and personality factors; (4) medical care access, utilization, and compliance; and (5) violence and crime.

For years, social, cultural, and economic influences have been suggested as part of the explanation for excess CVD mortality in certain populations and have been assumed to be the nature of the disparities that exist. The socioeconomic focus of this *Plan* is limited to access to quality care issues and cultural competency.

The health of individuals and communities depends greatly on **access to quality health care**. Expanding access to quality health care is important to eliminate health disparities and to increase the quality and years of healthy life for all people living in Mississippi. Health care in the broadest sense not only includes services received through health care providers, but also health information and services received through other venues in the community.

An important component of access to quality health care is the issue of **cultural competency** of the health care provider. Measures to make improvements in this area are identified in this *Plan* and more extensively in the MSDH *Plan to Eliminate Racial and Ethnic Disparities*. This plan's goals and objectives complement the CVD plan and are available at MSDH's Office of Minority Affairs or at www.msdh.state.ms.us.

Sociocultural Factors

Goal I: Identify and address the sociocultural factors that impact cardiovascular health. (Focus on access to quality care issues, cultural competency and health communication/education).

Goal II: Identify and reduce health disparities in CVD in target communities.

Objectives

- Identify socio-cultural influences (age; gender; ethnicity; economics; education; and community resources, risk factors, and barriers) on CVD that are specific to each target community by utilizing available information and conducting needs assessments in those communities.
- Increase the proportion of persons 18-64 who have health care coverage from 73 percent (2002) to 90 percent (BRFSS).
- Increase from 76 percent to 85 percent the proportion of persons 18 and older who can identify one provider as their usual primary care provider (BRFSS).
- Increase by 15 percent the proportion of persons who report that their health care provider has satisfactory communication skills (BRFSS).

Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
1. Increase the support for identifying and addressing socio-cultural factors and reducing health disparities in the community environment (schools, faith-based, civic).	1. Establish linkages between individual community groups and regional/state/national organizations and coalitions (e.g. NAACP, Urban League, Mississippi Health Advocacy Program).	1. Conduct needs assessments and utilize available data (e.g. GIS surveys) to identify key priorities in target communities. 2. Develop community programs to identify eligible recipients of subsidized health programs (e.g. Medicaid, Children’s Health Insurance Program). 3. Identify funding sources for community outreach programs addressing socio-cultural factors and health disparities.	1. Include social marketing materials on socio-cultural factors and health disparities in the CVD Awareness, Prevention, and Treatment Toolkit.	1. Support legislative funding to implement community-based programs that identify and address socio-cultural factors and health disparities.
2. Increase the proportion of work sites identifying and addressing socio-cultural factors and health disparities for their employees.	1. Identify and contact key personnel in major Mississippi industries to develop ongoing partnerships with regional/ state/national organizations and coalitions for improving health care coverage.	1. Conduct needs assessments and utilize available data to identify key priorities in target work sites. 2. Conduct training sessions to empower employees to foster effective communication with	1. Promote dissemination of the <i>Know Your Numbers</i> campaign in worksites. 2. Develop social marketing materials for use by worksites to disseminate information regarding socio-cultural	

		their health care providers. 3. Develop worksite programs to identify eligible recipients of subsidized health programs (e.g, Medicaid, Children’s Health Insurance Program).	factors and health disparities.	
3. Increase the support for addressing socio-cultural factors within healthcare systems and facilities by: a. improving cultural competency among healthcare providers. b. increasing efforts to improve access to health care.	1. Establish linkages between health care providers/medical societies and regional/state/national organizations that address race relations, cultural competency, health care access.	1. Conduct needs assessments and utilize available data to identify key priorities in target healthcare systems. 2. Develop programs within medical societies that can enhance health care providers’ cultural competency. 3. Identify opportunities for improved health care access through available resources/ programs.	1. Ensure that health care providers have access to culturally appropriate materials. 2. Incorporate information on socio-cultural awareness and cultural competency into toolkit and disseminate to health care providers and facilities.	1. Support the establishment of health facility policies on equal access to healthcare.

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Prevention of Risk Factors

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Management of Risk Factors

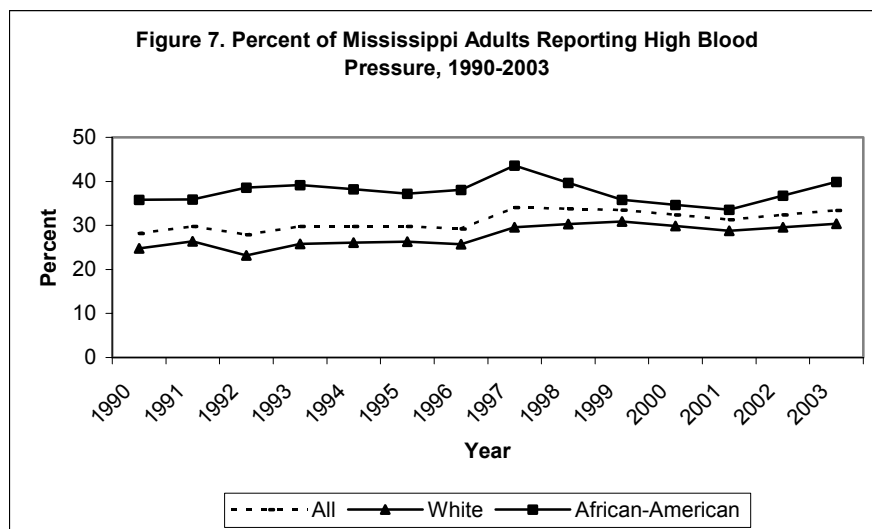
Management guidelines of hypertension, diabetes, high cholesterol, and obesity are well outlined in National Heart Lung and Blood Institute and American Diabetes Association-sponsored expert panels and education initiatives (committee reports of expert panels on diabetes, hypertension, lipid abnormalities and obesity). The CVD risk associations of these disease entities have been well documented (Law, 1994; MacMahon, 1990; Manson, 1995; Rewers, 1992); therefore, the potential to significantly reduce CVD mortality is evident.

Using strategies outlined in the overview, risk factor identification through enhanced screenings, risk factor control through education efforts aimed at behavioral modification, and appropriate risk factor treatment through practice guidelines should accomplish CVD management goals. The success of these management goals rests on the establishment of effective collaborations/partnerships, program services, public awareness, and policies within Mississippi communities, worksites, and health care systems.

Hypertension

Mississippi's Hypertension Problem

Mississippi leads the nation in cardiovascular disease and is estimated to have the second highest prevalence of hypertension. Between 1990 and 1996 the percentage of adult Mississippians with hypertension remained fairly constant at 28-30 percent. In 1997, this figure increased to 34 percent, and in 1999 it was 33.5 percent. The 2000 Behavioral Risk Factor Surveillance System (BRFSS) survey reported that 31.3 percent of Mississippians have been told by a doctor or other health professional that they have high blood pressure, and the 2003 survey reported 33.4 percent (Figure 7). Approximately 644,000 adults in the state are estimated to have hypertension (*2004 Mississippi State of the Heart Report*).



Hypertension as a Risk Factor

Hypertension or high blood pressure is the most important modifiable risk factor for coronary heart disease, stroke, congestive heart disease, end-stage renal disease, and peripheral vascular disease (Kannel, 1991; Klag, 1996; Stamler, 1993). It is also a component of the metabolic syndrome, a significant contributor of CVD deaths (Trevisan, 1998). Mississippi's high and rising prevalence of hypertension is very likely an important reason for the state's high stroke and heart disease mortality rates.

Most evidence regarding the effects of blood pressure on the risks of cardiovascular disease is obtained from observational studies of the incidence of heart disease mortality or from clinical trials of antihypertensive therapy (Jiang, 1997). Data have shown that a reduction as small as 2mm Hg in diastolic blood pressure could have a significant impact on the number of CVD related deaths (Cook, 1995).

Management Of Hypertension Through Identification, Education, And Medical Treatment

Results from the Atherosclerosis Risk in Communities Study (ARIC) show that substantial efforts to uncover, effectively communicate, and treat major cardiovascular risk factors are still needed in order to reduce the CVD incidence and related morbidity and mortality (Nieto, 1995). The *Plan's* efforts to increase risk factor screenings, therefore, speak to the need to decrease the number of those who are undiagnosed.

Lifestyle changes that may improve control of hypertension are central to public health programs for reduction of CVD risk. The alarming increase in childhood and adolescent obesity will lead to an increase in hypertension, thus early health education interventions have been identified for this at-risk population. The *Plan* integrates the Mississippi Chronic Illness Coalition (MCIC) *Know Your Numbers* Campaign into its hypertension program services and awareness strategies.

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure provides the blueprint for assisting health providers in administering quality, standardized care for the evaluation and treatment of patients with hypertension. Strategies to encourage the use of management guidelines are incorporated into the *Plan*.

Hypertension

Goal I: Increase awareness of high blood pressure as a risk factor for CVD.

Goal II: Reduce the proportion of Mississippians who have uncontrolled high blood pressure.

Objectives

By 2013:

- Implement a public awareness public education campaign to increase awareness of high blood pressure as a risk factor for CVD.
- Among Mississippi adults who report that they have high BP, increase the proportion who are currently taking medicine for their high BP from 77 percent (2001 BRFSS) to 82 percent.
- Prevent an increase in the proportion of Mississippians who have had their blood pressure measured and been told by a health care provider that it was high (BRFSS -33 percent in 2003).
- Increase the proportion of health care providers who implement current evidence-based management guidelines in the care of persons with high blood pressure (statewide survey of healthcare providers).

Refer to sections on Prevention of Risk Factors for objectives and strategies to reduce physical inactivity, improper nutrition, tobacco use, and socio-cultural risks that are critical to prevention and control of high blood pressure.

Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
1. Increase opportunities and support for blood pressure screening, awareness, and control in local communities.	1. Establish linkages between individual community groups and regional/ state/ national organizations and coalitions to promote blood pressure screening and education.	1. Establish programs that develop community and neighborhood initiatives for blood pressure screening (<i>Search Your Heart</i> , American Diabetes Association programs, <i>Is Your Number Up</i>). 2. Implement a Community Health Advisor Network program in target communities. 3. Create and disseminate a community toolkit of programs for utilization by community and neighborhood initiatives (e.g. <i>Search Your Heart</i> , <i>Strike Out Stroke</i>).	1. Utilize community media outlets to provide cues and messages to encourage people to monitor and control their blood pressure. 2. Create and disseminate a media toolkit for use by communities in providing blood pressure screening, awareness, and control activities (bulletin inserts, posters, public service announcements, signage, press releases, speakers bureau). 3. Promote dissemination of <i>Know Your Numbers</i>	1. Develop and advocate for model preventive benefits that include screening, lifestyle changes, and wellness programs for health insurance plans to voluntarily adopt. 2. Encourage Mississippi Restaurant Association to advocate an increase in the number of low-sodium menu selections.

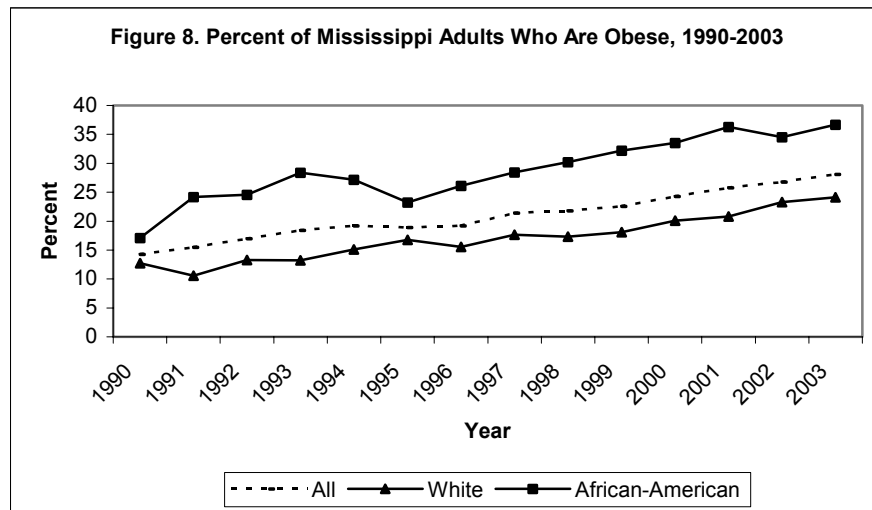
			campaign in local communities.	
2. Increase the proportion of worksites that promote blood pressure screening, awareness, and control for their employees.	1. Identify and contact key personnel in major Mississippi industries (e.g. farming, poultry, timber, construction, food service, manufacturing, and casino) to develop ongoing partnerships with regional/state/national organizations and coalitions for implementing blood pressure screening, awareness, and control activities.	1. Promote and evaluate culturally-relevant worksite blood pressure screening, awareness, and control programs (local pilot projects in target communities). 2. Facilitate worksite identification of lay leaders to serve as facilitators of CVD prevention activities, including blood pressure screening, awareness, and control. 3. Conduct leader and instructor worksite training sessions in blood pressure monitoring designed to complement the services/ programs offered by the individual worksite. 4. Create and disseminate a toolkit of blood pressure monitoring programs for utilization by worksite initiatives (e.g. worksite wellness program <i>Heart at Work</i>).	1. Provide all key worksites with copy of the <i>Mississippi State Plan for Heart Disease and Stroke Prevention and Control</i> . 2. Promote dissemination of <i>Know Your Numbers</i> campaign in worksites. 3. Develop social marketing materials for use by worksites to disseminate blood pressure monitoring information, tips, articles, and employee of the month personal “success” stories via newsletters, closed circuit TV, intranet, and other relevant outlets.	3. Advocate for worksites to adopt insurance plans that include health screening, lifestyle management, and wellness benefits.
3. Increase the capacity of healthcare providers, settings, and organizations to address blood pressure control.	1. Establish linkages between local health care providers/ facilities and local/state/national resources that encourage blood pressure monitoring and control activity (e.g. Mississippi Chronic Illness Coalition, Governor’s Commission on Physical Fitness	1. Provide and promote training of health care providers/ facilities on implementing evidence-based tools and guidelines, and creating systems to deliver appropriate preventive care (e.g. current Joint National Committee, <i>Put</i>	1. Disseminate to healthcare providers protocol/guidelines/ tools for screening, monitoring, and control of elevated blood pressure. 2. Create and distribute “Health Care Provider Alerts” and regular newsletters on	1. Encourage implementation of insurance regulations to provide reimbursement for lifestyle counseling (e.g. Medicaid, Insurance Commission). 2. Encourage legislation that supports policy

	<p>and Sports, American Heart Association).</p> <p>2. Collaborate with peer review organizations.</p> <p>3. Create and disseminate a toolkit of resources for utilization by health care providers, facilities, and organizations.</p>	<p><i>Prevention Into Practice</i>).</p> <p>2. Use the train-the-trainer model to establish an expert resource network (local pilot projects in target communities).</p>	<p>risk of high blood pressure.</p> <p>3. Promote the <i>Know Your Numbers</i> campaign in all Mississippi health care facilities.</p> <p>4. Develop social marketing materials for use by health care providers and facilities to disseminate information, blood pressure monitoring and control tips, articles, and personal “success” stories via newsletters, posters, closed circuit TV, and other relevant outlets.</p>	<p>recommendations for blood pressure screening, education, and control from key state task forces and councils (CVD, obesity, diabetes).</p> <p>3. Advocate for development of clinical registry of all clients and provision of technical assistance to local healthcare providers in maintaining registry.</p> <p>4. Advocate for policies that assure utilization of current evidence-based guidelines for blood pressure screening and control (e.g. current Joint National Committee).</p>
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Obesity

Mississippi's Obesity Problem

Mississippi has the highest prevalence of obese persons in the nation. According to the 2004 *Mississippi State of the Heart Report*, the percentage of adult Mississippians with a BMI equal to or greater than 30 has increased steadily since 1990. Currently 28.1 percent of adult Mississippians are obese (Figure 8). About 75 percent of African-American women in the Atherosclerosis Risk In Communities cohort (primarily from Jackson, Mississippi) were obese (Folsom, 1991).



Obesity as a CVD Risk Factor

It is well established that obesity increases one's risk for developing hypertension and diabetes (two well-known CVD risk factors); however, the evidence for the direct relationship of obesity to CVD is inconsistent (Calle, 1999). One study has shown that the risk of death from all causes, including CVD, increases throughout the range of moderate and severe overweight for both men and women. In one cohort, the BMI was more strongly associated with deaths due to CVD than with death due to all other causes (Manson, 1995). Given some evidence for the association of obesity and CVD, whether through a direct effect or the indirect effects of its contribution to the risk for hypertension and diabetes, effective control and reduction intervention strategies should significantly reduce obesity-related CVD deaths.

Management of Obesity Through Education and Behavior Change

The National Heart Lung and Blood Institute's (NHLBI) *Practical Guide to Identification, Evaluation, and Treatment of Overweight and Obesity in Adults* identifies classification guidelines in order to assess the degree of risks attributable to weight. Established waist circumference parameters, BMI, and the presence of co-morbidities are also used in their risk

assessments. Obesity education and awareness are components of the MCIC *Know Your Numbers* campaign, and the *Plan* will utilize this resource in its obesity management efforts.

Although there exist some safe, effective pharmacologic and surgical measures for weight reduction (primarily in the case of morbid obesity), for the most part obesity management strategies focus on education and awareness that affect behavioral change. Partnerships and a medical team approach are important components of an effective weight reduction regimen. The CVD *Plan* utilizes this team approach. The Mississippi Council on Obesity Prevention and Management will develop a comprehensive plan to combat the efforts of overweight and obesity in the state.

Obesity

Goal I: Increase awareness of obesity as a risk factor for CVD.

Goal II: Reduce the proportion of Mississippians who are classified as obese (BMI \geq 30).

Objectives

By 2013:

- Implement a public awareness education campaign to increase awareness of obesity as a risk factor for CVD.
- Among adults, decrease from 27 percent (2002) to 20 percent the proportion of Mississippians who report themselves as being obese based on BMI (BRFSS).
- Among children, decrease from 16 percent (2003) to 10 percent the proportion of Mississippians who report themselves as being overweight based on BMI (YRBS).
- Increase the proportion of adult Mississippians who are trying to lose weight from 36.8 percent to 41 percent (BRFSS).
- Increase the proportion of adult Mississippians who are using physical activity to lose or maintain weight from 55.6 percent to 62 percent (BRFSS).
- Increase the proportion of Mississippi children who are using physical activity to lose or maintain weight by 5 percent (YRBS).
- Increase the proportion of health care providers who implement current evidence-based management guidelines in the care of obese persons (statewide survey of healthcare providers).

Refer to sections on Prevention of Risk Factors for objectives and strategies to reduce physical inactivity, improper nutrition, and socio-cultural risks that are critical to prevention and control of obesity.

Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
1. Increase opportunities and support for obesity control and awareness and physical activity in local communities and schools.	1. Establish linkages between individual community groups and regional/state/national organizations and coalitions that promote obesity/BMI screening and education (e.g. Mississippi Chronic Illness Coalition, Mississippi Stroke Education Consortium, American Heart Association, Arthritis Foundation).	1. Establish programs that develop community and neighborhood initiatives for BMI screening (American Diabetes Association, American Heart Association, Weight Watchers). 2. Implement a Community Health Advisor Network program in target communities.	1. Create and disseminate a community toolkit of programs for utilization by community and neighborhood initiatives (e.g. Search Your Heart, Mississippi Stroke Education Consortium). 2. Promote dissemination of <i>Know Your Numbers</i> campaign in local communities. 3. Utilize community media outlets to provide cues and messages to encourage people to monitor and control their weight.	1. Develop and advocate for model preventive benefits that include screening, lifestyle changes, and wellness programs for health insurance plans to voluntarily adopt. 2. Encourage Mississippi Restaurant Association to advocate an increase in the number of low-sodium menu selections.

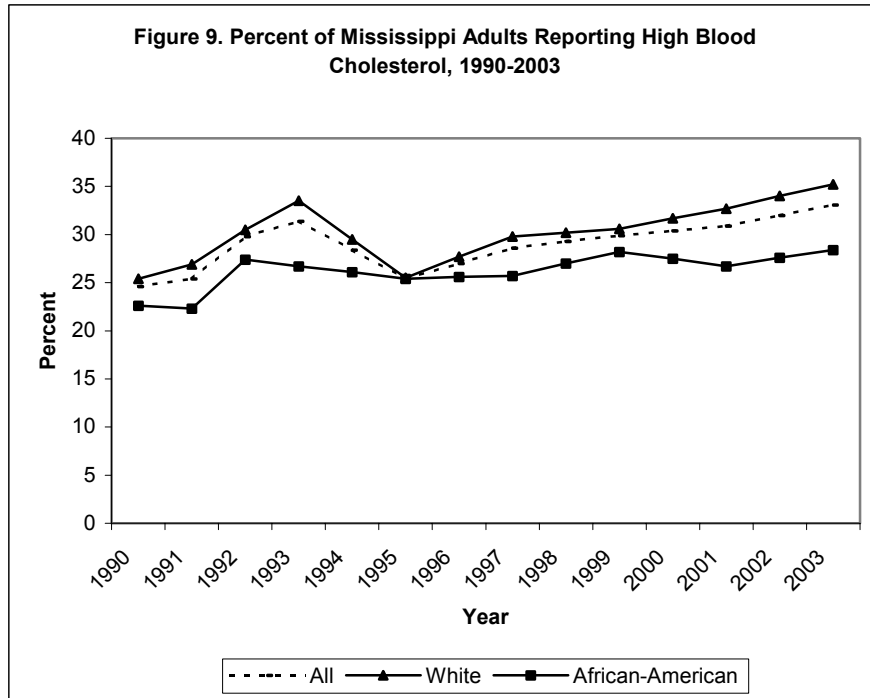
			4. Create and disseminate a media toolkit for use by communities in providing obesity/BMI screening, awareness, and control activities (bulletin inserts, posters, public service announcements, signage, press releases, closed circuit television, speakers bureau).	
2. Increase the proportion of worksites that promote BMI and obesity screening, awareness, and weight control for their employees.	1. Identify and contact key personnel in major Mississippi industries (e.g. farming, poultry, timber, construction, food service, manufacturing, and casino) to develop ongoing partnerships with regional/state/national organizations and coalitions for implementing BMI/obesity screening, awareness, and weight control activities.	1. Promote and evaluate culturally-relevant worksite BMI screening, awareness, and weight control programs (local pilot projects in target communities). 2. Facilitate worksite identification of lay leaders to serve as facilitators of weight control activities, including BMI screening and awareness. 3. Conduct leader and instructor worksite training sessions in BMI screening and weight control designed to complement the services/ programs offered by the individual worksite. 4. Create and disseminate a toolkit of weight control/BMI monitoring programs for utilization by worksite initiatives (e.g. worksite wellness programs, <i>Know Your Numbers</i> , <i>Weight Watchers</i> , <i>Heart at Work</i>).	1. Provide all key worksites with copy of the <i>Mississippi State Plan for Heart Disease and Stroke Prevention and Control</i> . 2. Promote dissemination of <i>Know Your Numbers</i> campaign in worksites. 3. Develop social marketing materials for use by worksites to disseminate weight control monitoring information, tips, articles, and employee of the month personal success stories via newsletters, closed circuit TV, intranet, and other relevant outlets.	1. Advocate for worksites to adopt insurance plans that include health screening, lifestyle management, and wellness benefits. 2. Increase the capacity of healthcare providers, settings, and organizations to address weight control.

<p>3. Increase the proportion of healthcare settings that promote BMI screening and awareness.</p>	<ol style="list-style-type: none"> 1. Establish linkages between local health care providers/ facilities and local/state/national resources that encourage BMI monitoring and weight control activity (e.g. Mississippi Chronic Illness Coalition, Governor’s Commission on Physical Fitness and Sports, American Heart Association). 2. Collaborate with peer review organizations (Information for Quality Healthcare). 3. Create and disseminate a toolkit of resources for utilization by health care providers, facilities, and organizations. 	<ol style="list-style-type: none"> 1. Provide and promote training of health care providers/facilities on implementing evidence-based tools and guidelines, and creating systems to deliver appropriate preventive care (e.g. current Joint National Committee, <i>Put Prevention Into Practice</i>). 2. Use the train-the-trainer model to establish an expert resource network (local pilot projects in target communities). 	<ol style="list-style-type: none"> 1. Disseminate to healthcare providers protocol/ guidelines/ tools for BMI screening, monitoring, and weight control. 2. Create and distribute Health Care Provider Alerts and regular newsletters on risk of obesity and elevated BMI. 3. Promote the <i>Know Your Numbers</i> campaign in all Mississippi health care facilities. 4. Develop social marketing materials for use by health care providers and facilities to disseminate information, BMI monitoring and weight control tips, articles, and personal success stories via newsletters, posters, closed circuit TV, and other relevant outlets. 	<ol style="list-style-type: none"> 1. Encourage implementation of insurance regulations to provide reimbursement for lifestyle counseling (e.g. Medicaid, Insurance Commission). 2. Encourage legislation that supports policy recommendations for BMI screening, education, and weight control from key state task forces and councils (CVD, obesity, diabetes). 3. Advocate for development of clinical registry of all clients and provision of technical assistance to local healthcare providers in maintaining registry. 4. Advocate for policies that assure utilization of current evidence-based guidelines for BMI screening and weight control (e.g. American Dietetic Association).
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Abnormal Cholesterol

Mississippi's Hypercholesterolemia Problem

The percentage of adult Mississippians reporting high blood cholesterol has changed little since 1990 and currently stands at about 33.1 percent (Figure 9).



Hypercholesterolemia as a CVD Risk Factor

Studies across different populations reveal that those with higher cholesterol levels have more atherosclerosis and coronary heart disease (CHD) than do those having lower levels according to the *National Cholesterol Education Program Adult Treatment Panel III* (ATP III). The positive relationship between serum cholesterol levels and the development of CHD is observed over a broad range of low density lipoprotein (LDL) cholesterol levels; the higher the level the greater the risk (ATP III). Clinical trials have proven that reduction of cholesterol with diet change and drug therapy decreases risk for CVD (Sacks, 1996; Scandinavian Simvastatin Survival Study Group, 1994; Shephard, 1995).

Management of Hypercholesterolemia Through Screening, Education, and Treatment

The Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults provides guidelines for the recognized standard of care for hypercholesterolemia. Although the ATP III guidelines recommend cholesterol screening every five years for adults, BRFSS data from 2001 shows that only 71.2 percent of Mississippians

report that they have had a cholesterol check. Enhancing screening programs is, therefore, a component of the *Plan's* cholesterol management approach. Cholesterol education is also included in the *Know Your Numbers* campaign, which establishes this campaign as an appropriate tool for cholesterol education and awareness in Mississippi's *Plan*.

In spite of compelling evidence that cholesterol lowering interventions impact the development of CVD, health care providers have not adequately utilized the available prevention and treatment modalities. Data from one study suggests that despite the ATP II guidelines risk factor assessment, counseling and drug therapy remain inadequate (Frolkis, 1998). Because of the problems that untreated hypercholesterolemia can produce, efforts to enhance provider adherence to guidelines will be instituted.

Abnormal Cholesterol

Goal I: Increase the proportion of adult Mississippians who get their cholesterol checked and are addressing problems with high cholesterol.

Goal II: Decrease the proportion of adult Mississippians with an elevated total cholesterol.

Objectives

By 2013:

- Decrease from 27 percent (2001) to 20 percent the number of adults who have never had their cholesterol checked (BRFSS).
- Increase from 70 percent (2001) to 80 percent the proportion of adults who have had their cholesterol checked in the last five years (BRFSS).
- Increase from 24 percent (2002) to 30 percent the number of adults whose health care provider has advised them to eat fewer high fat/high cholesterol foods (BRFSS).
- Increase from 59 percent (2002) to 70 percent the number of adults who are eating fewer high fat/high cholesterol foods (BRFSS).

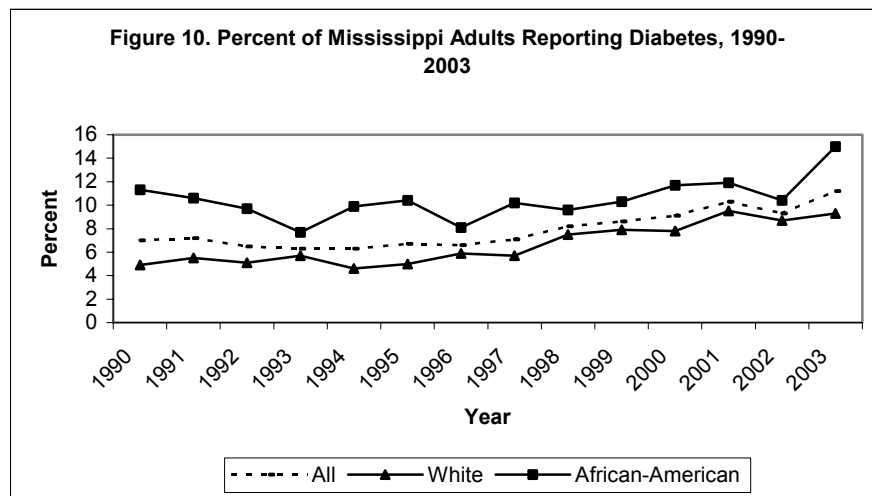
Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
1. Create opportunities to increase blood cholesterol screening, awareness, and control within communities.	1. Establish linkages between individual community groups and health care organizations (hospitals, health insurance providers) to increase screening opportunities and improve cholesterol education (broaden the distribution of <i>Know Your Numbers</i> campaign). 2. Create and disseminate a community toolkit of resources for utilization by community based collaborations/partnerships.	1. Encourage the development of screening events within the community. 2. Implement the Community Health Advisor Network program in target communities.	1. Utilize community media outlets to provide information on cholesterol screening opportunities and to provide cholesterol education cues and messages. 2. Create and disseminate a media toolkit for use by communities in providing cholesterol education cues and messages (bulletin inserts, posters, public service announcements, signage, press releases, closed circuit television, speakers bureau).	1. Encourage Mississippi Restaurant Association to advocate an increase in the number of low-fat menu selections. 2. Support policy initiatives related to increasing cholesterol education.
2. Increase the proportion of worksites that promote cholesterol screening and education among their employees.	1. Identify and contact key personnel in major Mississippi industries (e.g. farming, poultry, timber, construction, food service, manufacturing, and gaming) to develop ongoing partnerships with regional/ state/national organizations and coalitions for	1. Promote and evaluate culturally-relevant worksite cholesterol education programs (local pilot projects in target communities). 2. Facilitate worksite identification of lay leaders to serve as facilitators of	1. Provide all key worksites with copy of the <i>Mississippi State Plan for Heart Disease and Stroke Prevention and Control</i> . 2. Promote dissemination of <i>Know Your Numbers</i> campaign in worksites.	1. Encourage the enrollment of additional worksites into the Blue Cross Blue Shield <i>Healthy You</i> wellness program. 2. Impact organizational policy to include cholesterol screening and education in

	<p>implementing cholesterol screenings and education in worksites.</p> <p>2. Create and disseminate a toolkit of resources for utilization by worksite collaborations and partnerships.</p>	<p>cholesterol awareness and education activities.</p> <p>3. Conduct leader and instructor worksite training sessions in cholesterol education designed to complement the services/programs offered by the individual worksite.</p>	<p>3. Develop social marketing materials for use by worksites to disseminate information, menu selection tips, articles, and employee of the month personal “success” stories via newsletters, closed circuit TV, intranet, and other relevant outlets.</p>	<p>their wellness plans.</p>
<p>3. Increase the capacity of healthcare providers, settings, and organizations to promote cholesterol awareness and provide educational counseling.</p>	<p>1. Establish linkages between local health care providers/ facilities and local/state/national resources that encourage cholesterol screening and education.</p> <p>2. Collaborate with peer review and other organizations (e.g. Information for Quality Healthcare, Mississippi Healthcare Association, Mississippi Hospital Association).</p> <p>3. Create and disseminate a toolkit of resources for utilization by health care providers, facilities, and organizations.</p>	<p>1. Provide and promote training of health care providers/facilities on implementing ATP III (Third Report of the National Cholesterol Education Program Expert Panel on the Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults - Adult Treatment Panel III) guidelines and creating systems to deliver appropriate counseling and treatment.</p> <p>2. Use the train-the-trainer model to establish an expert speakers bureau (local pilot projects in target communities).</p>	<p>1. Provide ATP III to all health care providers.</p> <p>2. Promote the <i>Know Your Numbers</i> campaign in all Mississippi health care facilities.</p> <p>3. Develop social marketing materials for use by health care providers and facilities to disseminate information.</p>	<p>1. Encourage implementation of insurance regulations to provide reimbursement for cholesterol counseling, using <i>Healthy You</i> as a model (e.g. Medicaid, Insurance Commission).</p> <p>2. Encourage legislation that supports policy recommendations for cholesterol screening, education, and control from key state task forces and councils (CVD, obesity, diabetes).</p> <p>3. Advocate for policies that assure utilization of current evidence-based guidelines for cholesterol screening and control (National Cholesterol Education Program).</p> <p>4. Advocate for development of clinical registry of all clients and provision of technical assistance to local healthcare providers in maintaining registry.</p>

Diabetes

Mississippi's Diabetes Problem

According to the *2004 Mississippi State of the Heart Report*, between 1990 and 1996, the percentage of adult Mississippians with diabetes remained fairly constant at around 6 percent. By 2002, it had increased to 8.6 percent. Approximately 270,000 adults in the state are now estimated to have diabetes; about one-third of these have not been diagnosed. More than 400,000 adult Mississippians are at risk of developing diabetes in the future because of overweight and physical inactivity. In 2003, 11.2 percent of the population had diabetes (Figure 10).



Diabetes as a CVD Risk Factor

The United Kingdom Prospective Diabetes Study (United Kingdom Prospective Study Group, 1998), the largest and longest study on patients with Type 2 diabetes, showed a continuous association between the risk of CVD complications and glycemia. The data revealed that when a person's blood glucose is under optimal control, the risks of complications associated with the heart, such as stroke and heart failure, are significantly reduced. Much of the morbidity and mortality associated with diabetes is due to chronic complications, CVD included. According to the American Diabetes Association, persons with Type 2 diabetes are two to four times more likely to experience heart attack and stroke, and at an earlier age, than people without diabetes.

Management of Diabetes

Many people with diabetes do not realize that they are at very high risk for cardiovascular disease, and that this risk can be greatly reduced with appropriate treatment. Increasing awareness of these risks is a first step to ensure that persons with diabetes receive the appropriate quality care. Public awareness efforts should be directed to both patients and their health care providers.

The National Diabetes Education Program has developed *Guiding Principles for Diabetes Care for Health Care Providers and People with Diabetes*. Through this guide, along with *Mississippi's State Plan for Diabetes Prevention and Control, 2003*, a comprehensive approach to enhancing self-management behaviors for patients and improved medical management for providers can be accomplished.

Diabetes

Goal I: Increase awareness of diabetes as a preventable and/or treatable risk factor for CVD.

Goal II: Improve diabetes care and patient self-management behaviors to reduce chronic complications of diabetes.

Objectives

By 2008:

- Develop and implement a method to obtain baseline data on the awareness of diabetes as a preventable and or treatable risk factor for CVD.
- Provide state legislators and policy makers with information on the number of Mississippians afflicted with diabetes and the impact of this disease on the state's citizens.

By 2013:

- Increase from 81 percent (2002) to 90 percent the proportion of persons with diabetes who check their glucose at least twice a week (BRFSS).
- Increase from 67 percent (2002) to 80 percent the proportion of persons with diabetes who check their feet at least once a day (BRFSS).
- Increase the proportion of healthcare providers who implement current evidence-based management guidelines in the care of patients with diabetes (statewide survey of healthcare providers).

Refer to sections on Prevention Risk of Factors for objectives and strategies to reduce physical inactivity, inadequate nutrition, and socio-cultural risks that are critical to prevention and control of diabetes.

Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
1. Create opportunities to increase blood glucose screening, awareness, and control within communities.	1. Establish linkages between individual community groups and regional/state/national organizations and coalitions that promote blood glucose screening and education (e.g. Mississippi Chronic Illness Coalition, Mississippi Stroke Education Consortium, American Heart Association, American Diabetes Association, Diabetes Foundation of Mississippi).	1. Establish programs that develop community and neighborhood initiatives for diabetes screening and awareness (e.g. ADA, DFM, MCIC, CHC, COHA). 2. Implement a Community Health Advisor Network program in target communities. 3. Create and disseminate a community toolkit of programs for utilization by community and neighborhood initiatives (e.g. Diabetes Sunday, It's a Sweet Subject, Cardiovascular Learning Partnership, <i>Know Your Numbers</i>).	1. Utilize community media outlets to provide cues and messages to educate persons about diabetes and to encourage people to monitor and control their blood sugar. 2. Create and disseminate a media toolkit for use by communities in providing diabetes screening, awareness, and control activities (bulletin inserts, posters, public service announcements, signage, press releases, closed circuit television, speakers bureau).	1. Develop and advocate for model preventive benefits that include screening, lifestyle changes, and wellness programs for health insurance plans to voluntarily adopt. 2. Encourage Mississippi Restaurant Association to advocate an increase in the number of diabetic menu selections.

<p>2. Increase the proportion of worksites that promote diabetes screening, awareness, and control for their employees.</p>	<p>1. Identify and contact key personnel in major Mississippi industries (e.g. farming, poultry, timber, construction, food service, manufacturing, and gaming) to develop ongoing partnerships with regional/state/national organizations and coalitions for implementing diabetes screening, awareness, and control activities.</p>	<p>1. Promote and evaluate culturally-relevant worksite diabetes screening, awareness, and weight control programs (local pilot projects in target communities). 2. Facilitate worksite identification of lay leaders to serve as facilitators of diabetes control activities, including screening and awareness. 3. Conduct leader and instructor worksite training sessions in diabetes screening and control designed to complement the services/programs offered by the individual worksite. 4. Create and disseminate a toolkit of diabetes monitoring programs for utilization by worksite initiatives (e.g. worksite wellness programs, <i>Know Your Numbers</i>, <i>Heart at Work</i>).</p>	<p>1. Provide all key worksites with copy of the <i>Mississippi State Plan for Heart Disease and Stroke Prevention and Control</i>. 2. Promote dissemination of <i>Know Your Numbers</i> campaign in worksites. 3. Develop social marketing materials for use by worksites to disseminate diabetes control monitoring information, tips, articles, and employee of the month personal success stories via newsletters, closed circuit TV, intranet, and other relevant outlets.</p>	<p>1. Advocate for worksites to adopt insurance plans that include health screening, lifestyle management, and wellness benefits.</p>
<p>3. Increase the capacity of healthcare providers, healthcare settings, and organizations to address diabetes monitoring and control.</p>	<p>1. Establish linkages between local health care providers/ facilities and local/state/national resources that encourage diabetes monitoring and control activities (e.g. American Diabetes Association, Diabetes Foundation of Mississippi, Diabetes Educator Association, Mississippi Chronic Illness Coalition). 2. Collaborate with peer review organizations.</p>	<p>1. Provide and promote training of health care providers/ facilities on implementing evidence-based tools and guidelines, and creating systems to deliver appropriate preventive care (e.g. American Diabetes Association, National Kidney Foundation, <i>Put Prevention into Practice</i>). 2. Use the train-the-trainer</p>	<p>1. Disseminate to healthcare providers protocol/ guidelines/ tools for diabetes screening, monitoring, management and control. 2. Create and distribute Health Care Provider Alerts and regular newsletters on risk of diabetes and updates on diabetes management. 3. Promote the <i>Know Your Numbers</i> campaign in all</p>	<p>1. Encourage implementation of insurance regulations to provide reimbursement for lifestyle counseling, diabetes self management educational classes (e.g. Medicaid, Insurance Commission). 2. Encourage legislation that supports policy recommendations for diabetes self management</p>

	<p>3. Create and disseminate a toolkit of resources for utilization by health care providers, facilities, and organizations.</p>	<p>model to establish an expert resource network (local pilot projects in target communities).</p>	<p>Mississippi health care facilities. 4. Develop social marketing materials for use by health care providers and facilities to disseminate information, diabetes management, monitoring and control tips, articles, and personal success stories via newsletters, posters, closed circuit TV, and other relevant outlets.</p>	<p>education and control from key state task forces and councils (CVD, obesity, diabetes). 3. Advocate for development of clinical registry of all clients and provision of technical assistance to local healthcare providers in maintaining registry. 4. Advocate for policies that assure utilization of current evidence-based guidelines for diabetes screening and control (e.g. ADA).</p>
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Acute Event

An acute event is defined as the actual occurrence of a heart attack, stroke, transient ischemic attack (TIA), or sudden cardiac arrest. Two-thirds of sudden cardiac deaths occur out of hospitals. Any person who is experiencing cardiac arrest, heart attack, stroke, or foreign-body airway obstruction should have emergency medical care. Knowing the warning signs of these conditions will help in recognizing a medical emergency.

Response to an Acute Event

Chain of Survival

The American Heart Association has the *Chain of Survival* as a standard sequence of response to an acute cardiac event. The *Chain of Survival* concept has been shown to increase the survival rate of cardiac arrest and stroke victims in communities across the nation by as much as 20 percent. The *Chain of Survival* is made up of four links:

- early access to 911 emergency response system,
- early cardiopulmonary resuscitation (CPR),
- early defibrillation, and
- early advanced care.

Early access means immediately contacting the emergency system. In most communities, dialing 911 activates the emergency medical system, which dispatches the appropriate emergency personnel to the scene. This immediate access of 911 requires that the bystanders at an acute event recognize the symptoms of cardiac arrest or other emergencies and take immediate action. The early access of the 911 emergency system requires that such a response mechanism is available in the community and that the emergency dispatchers are certified and trained in pre-arrival instructions for the caller. Activation of the emergency response system should be carried out before the other links of the *Chain of Survival* when possible.

Early cardiopulmonary resuscitation means utilizing chest compressions and rescue breathing to maintain a small, but significant amount of blood flow to the heart and brain. If performed properly, CPR can sustain life and add a few minutes to the time available for successful defibrillation. CPR is most effective when started immediately after the victim's collapse.

Early defibrillation is the delivery of an electrical shock to restore an abnormally beating heart to a normal rhythm. Early defibrillation is often called the critical link in the chain of survival. Defibrillation can restore the heart's normal rhythm if it is done within minutes of the arrest. Each minute of delay in returning the heart to its normal pattern of beating decreases the chance of survival by 7-10 percent.

After as little as 10 minutes, very few resuscitation attempts are successful. Access to defibrillation depends on the availability and proximity of automated external defibrillators (AEDs) to the location of an acute event.

Early advanced care, the fourth link in the *Chain of Survival*, means the ability to treat an emergency using advanced lifesaving techniques. In some cases of cardiac arrest, defibrillation is the only emergency care that is needed. In others, patients require more advanced treatments, such as airway control and intravenous drugs. Hospital preparedness for early advanced care, including proper knowledge, equipment, and medication to treat victims is key to survival.

Each link of the *Chain of Survival* is important, a part of an integrated system. Just as a real chain is “only as strong as its weakest link,” each link has a key role in the success of the overall system. That is why focusing on just one link in the *Chain of Survival* rarely brings the greatest benefits. For emergency care to be truly successful, the entire *Chain of Survival* must function quickly and effectively.

Acute Event

Goal: Increase the survival rate from cardiac arrest, heart attack, and stroke in Mississippi.

Objectives

Early Recognition/Early 911:

By 2013:

- Increase the percent of Mississippians who can name at least two of the symptoms of a heart attack by 20 percent (Baseline: 2004 BRFSS).
- Increase the percent of Mississippians who report that they would call 911 for stroke symptoms by 20 percent (Baseline: 2004 BRFSS).
- Increase the percent of Mississippi counties covered by 911 service from 93 percent to 100 percent (Emergency Medical Services and American Heart Association).

Early CPR/Early Defibrillation

By 2013:

- Increase the percentage of the population trained in CPR from 3 percent to 18 percent (American Heart Association).
- Increase the number of automated external defibrillators (AEDs) placed with first responders by 15 percent (Emergency Medical Services).
- Increase the number of AEDs placed for public access by 200 devices (EMS).

Early Access to Quality Healthcare

By 2013:

- Increase the percent of Mississippi paramedics and EMTs trained in acute treatment of stroke by 30 percent (AHA-Baseline: 20).
- Develop and implement an Acute Cardiac and Stroke System through EMS to determine the best hospital site for ambulances to deliver acute heart attack, cardiac arrest, and stroke patients.
- Increase the number of physicians practicing accepted clinical guidelines for heart disease and stroke and treatment (Information and Quality Healthcare).

Action	Collaborations/Partnerships	Program Services	Public Awareness	Policy
<p>1. Increase the recognition of heart attack and stroke symptoms and the immediate activation of the 911 system in the community environment.</p>	<p>1. Develop and implement a state-wide public education and awareness campaign to increase public awareness of the signs and symptoms of cardiac arrest, heart attack, and stroke and the need to call 911 immediately (e.g. AHA Call to Action, media, and faith-based).</p>	<p>1. Conduct CVD signs and symptoms awareness seminars in the community environment (e.g. <i>Search Your Heart</i>, Heart Month, and health screenings/health fairs). 2. Implement the Community Health Advisor Network program in target communities. 3. Create and disseminate a community toolkit of programs for utilization by community and neighborhood initiatives (e.g. <i>Search Your Heart</i>, WISEWOMAN, and Jackson Heart Study).</p>	<p>1. Utilize community media outlets to provide early recognition cues and messages. 2. Distribute American Heart Association materials on signs and symptoms to local churches, civic groups, and schools for dissemination. 3. Create and disseminate a media toolkit for use by communities in providing early recognition cues and messages (bulletin inserts, posters, public service announcements, signage, press releases, closed circuit television, and speaker's bureau).</p>	<p>1. Advocate for funds to implement public awareness/education campaigns. 2. Advocate on the state and local levels for legislation or regulation to require each Mississippi county to have complete 911 dispatch coverage and Enhanced 911 when available.</p>
<p>2. Increase the proportion of worksites that promote early recognition for their employees.</p>	<p>1. Identify and contact key personnel in major Mississippi industries (e.g. farming, poultry, timber, construction, food service, manufacturing, and gaming) to develop acute response teams trained to recognize the signs and symptoms of heart attack, cardiac arrest, and stroke. 2. Distribute materials on signs and symptoms to worksites for dissemination.</p>	<p>1. Facilitate worksite identification of lay leaders to serve as facilitators of early recognition programs. 2. Conduct leader and instructor worksite training sessions in early recognition, CPR, and AEDs designed to complement the services/programs offered by the individual worksite.</p>	<p>1. Develop social marketing materials for use by worksites to disseminate signs and symptoms information via newsletters, closed circuit TV, intranet, and other relevant outlets.</p>	<p>1. Establish state/local legislation that supports worksite acute response teams (liability exemption, tax-incentives, insurance incentives). 2. Impact organizational policy to assure worksite acute response teams.</p>
<p>3. Increase the proportion of healthcare providers that educate high-risk patients on</p>	<p>1. Collaborate with professional medical associations to encourage healthcare providers</p>	<p>1. Provide continuing education and conference training for health care providers on the</p>	<p>1. Distribute materials on signs and symptoms to healthcare facilities (e.g. local</p>	

<p>early recognition of signs and symptoms of heart attack and stroke.</p>	<p>to provide patient education/consultation on recognizing the signs and symptoms of heart attack, cardiac arrest, and stroke.</p>	<p>latest research on early recognition (e.g. stroke update, cardiology update).</p>	<p>health departments, community health centers, primary care clinics, hospitals).</p>	
<p><u>Early CPR/ Early Defibrillation</u> 1. Increase access to early cardiopulmonary resuscitation and defibrillation in the community environment.</p>	<p>1. Promote and recognize training centers that provide mass CPR training to the public. 2. Disseminate information to schools, training centers, and funders on how to implement CPR education in schools. 3. Assess the need for additional AEDs with first responders, EMS, private industry, churches, and community leaders and identify funding for the devices in the community.</p>	<p>1. Implement CPR into the high school health curriculum. 2. Encourage CPR training in communities.</p>	<p>1. Identify funding to implement public awareness campaigns that encourage Mississippians to be trained in CPR and AED use (e.g., <i>These Hands</i>).</p>	<p>1. Advocate for state and local regulations or legislation supporting CPR training for high school students. 2. Advocate for local or state regulation to require teachers, coaches, and other school personnel to be trained in CPR. 3. Advocate for the registration of all AEDs through the Mississippi State Department of Health, Division of Emergency Medical Services, and local EMS providers. 4. Advocate for policies that require all government buildings to be equipped with AEDs. 5. Advocate on the national, state, and local levels for funding for the purchase, placement, and training for AEDs in the community. 6. Advocate for comprehensive liability exemptions for users, owners, prescribing physicians, and other persons/entities related to the</p>

				use of or placement of AEDs.
2. Increase access to early cardiopulmonary resuscitation and defibrillation in the workplace.	1. Identify and contact key personnel in major Mississippi industries (e.g. farming, poultry, timber, construction, food service, manufacturing, and gaming) to develop acute response teams trained in CPR and AED use.	1. Promote worksite training for employees in CPR and AED use and recertification training as needed. 2. Promote the placement of AEDs in Mississippi worksites.	1. Develop and implement public education programs that encourage people to learn CPR and how to use an AED (e.g., television ads, billboards, survivor stories).	1. Provide incentive programs (tax or insurance) for workplaces that offer CPR training to employees. 2. Provide incentives (tax or insurance) for businesses that purchase AEDs and train employees in AED use.
<u>Early Access to Quality Healthcare</u> 1. Increase access to quality acute cardiac or stroke care in local communities.	1. Identify strengths and barriers to accessing quality healthcare in local communities.	1. Develop methods to disseminate information concerning available healthcare resources to those without adequate health care options through private insurance programs, government subsidized insurance programs, or on-site healthcare facilities.	1. Develop and implement public awareness campaigns designed to make the public aware of which hospitals are ready to provide quality acute cardiovascular or stroke care (<i>Know Before You Go</i> , Stroke Centers, Cardiac Centers).	1. Require certification and minimum training standards of emergency dispatch personnel.
2. Increase access to quality acute cardiac or stroke care in the worksite setting.	1. Identify and contact key personnel in major Mississippi industries (e.g. farming, poultry, timber, construction, food service, manufacturing, and gaming) to provide access to quality health care through private insurance programs, government subsidized insurance programs, and on-site healthcare facilities.	1. Develop methods to disseminate information concerning available healthcare resources to those without adequate health care options through worksites (community health centers, local health departments, health fairs/ screenings, and free clinics).	1. Create and disseminate media tools that provide information on public and private health insurance options.	1. Provide incentive programs (tax or insurance) for workplaces that offer an acute response team for heart attack, cardiac arrest, and stroke for employees.
3. Increase access to quality acute cardiac or stroke care in the healthcare setting.	1. Identify barriers to quality acute healthcare and develop strategies to alleviate those barriers with hospitals and emergency responders. 2. Address training issues in	1. Develop a statewide registry with hospitals to monitor quality of stroke care. 2. Provide continuing education for healthcare providers and emergency	1. Create and disseminate media tools that provide information on public and private health insurance options.	1. Promote the development of Cardiac and Stroke Centers in a majority of Mississippi hospitals (Joint Committee on Accreditation of Healthcare Organizations, Centers for

	<p>acute treatment of stroke for paramedics, medical technicians, and other first responders with emergency responders and related professional organizations.</p>	<p>medical staff (American Heart Association/American Stroke Association, Mississippi Stroke Education Consortium). 3. Develop methods to disseminate information concerning available healthcare resources to those without adequate health care options through private insurance programs, government subsidized insurance programs, and on-site healthcare facilities.</p>		<p>Medicare and Medicaid Services, American Heart Association/American Stroke Association, Mississippi State Department of Health). 2. Advocate for adequate funding for community health clinics through state and federal funds. 3. Advocate for adequate Medicaid and Medicare reimbursements for acute treatment of heart attack, cardiac arrest, and stroke. 4. Add an acute stroke module to the training requirements for paramedics.</p>
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Implementation

Infrastructure building will be critical in implementing the *Plan*. Infrastructure will be enhanced by establishing network partnerships across the state to ensure that each community, particularly target communities, utilize the tool kits and work to implement strategies endorsed by the *Plan*. These networks will be established by developing local coalition groups that address community needs related to cardiovascular disease prevention and control. The efforts of these groups will be coordinated.

The Mississippi State Cardiovascular Health Program will implement the *Plan* by collaborating with the Task Force on Heart Disease and Stroke Prevention, community-based organizations, voluntary agencies, and grassroots organizations. Pilot projects will be implemented in various regions of the state that reflect the needs of the community. The strategies will include utilizing community health workers, developing media packets for distribution, promoting health education campaigns, and educating communities about policy and structural influences on health. These strategies will be evaluated for their effectiveness and likelihood of replication in similar communities. Pilot projects will be implemented in target communities based on geographic information system data projects and existing data that show the need for tailored interventions.

Five committees will be developed, one to determine resources and one to address each of the four identified strategies: (1) partnerships and collaborations to assist in implementing the plan, (2) program services to meet the public's need, (3) public awareness to increase knowledge, and (4) policy development to ensure general population effect. Each committee will assess its strategy area in depth to determine the needs in four settings: communities, schools, worksites, and healthcare. The resource committee will identify available resources to implement the *Plan* and develop strategies for disseminating resources to communities.

Additionally, the Mississippi State Department of Health plans to identify CVH Coordinators for each public health district, who will be responsible for planning a CVD prevention program for their respective district. The MSDH CVH staff will train each coordinator to focus on policy and environmental approaches to improve health. Target settings for their work will be schools, worksites, healthcare facilities, and communities. Although training will provide a basis for program development, coordinators will be responsible for developing program plans and implementation activities with direct involvement from the community. The main outcome should be community-driven programs that educate on policy and environmental changes to influence health as well as actualization of policy development and structural changes within communities.

Community involvement at multiple levels will guide the process of the programs implemented by the coordinators. Community members involved should include key informants, employers, employees, school administrators, city administrators, and community coalitions. Integration into progressive coalitions will be essential to improving health outcomes by district; where such coalitions do not exist, coordinators will develop coalitions targeting the communities' specific health needs related to CVD prevention and control.

The work conducted by partners will be instrumental to fully implement the *Plan* and achieve the intended outcomes. Partnerships with groups such as the American Heart Association, American Cancer Society, and Mississippi Alliance for School Health will be further developed. Advocacy partners can greatly influence legislation that a state health department has a limited capacity to do. However, by partnering with such groups to bring awareness of gaps in legislation that can improve health, significant gains can be accomplished.

Surveillance

CVD Mortality, Morbidity, and Risk Factors

History, Current Activities, and Future Plans

Mortality

CVD mortality numbers and rates through 2001 are based on death certificate data provided by the Office of Health Informatics, Mississippi State Department of Health (MSDH). CVD mortality numbers and rates through 2000 are also available from the National Center for Health Statistics (NCHS) via CDCs WONDER system (<http://wonder.cdc.gov>). The following International Classification of Diseases (ICD) codes are used (Table 1):

Table 2. ICD Codes Used in CVD Mortality Surveillance

	ICD9	ICD10
All CVD	390-448	I00-I78
Non-stroke CVD	390-429, 440-448	I00-I59, I70-I78
IHD (CHD)	410-414	I20-I25
CVA (stroke)	430-438	I60-I69

Crude mortality rates are calculated using number of deaths as the numerator and the most recent mid-year population estimates for the state from the U.S. Census Bureau (www.census.gov) as the denominator. Crude rates are age-adjusted by the direct method using the 2000 U.S. population as the standard.

Important and potentially useful measures of mortality related to CVD include:

1. premature mortality due to CVD (for example, proportion of all deaths before age 65 due to CVD);
2. years of potential life lost due to CVD; and
3. average life expectancy at birth after elimination or reduction of CVD (compared to average life expectancy at birth without intervention).

Morbidity

The term *morbidity* is loosely interchangeable with the terms *sickness*, *illness*, and *disease* (including injury and disability). Morbidity statistics (prevalence and incidence), therefore, measure the amount of illness or disease in the population. *Incidence* measures how rapidly new cases of a disease are developing, whereas *prevalence* measures the total number of cases, both

new and long-standing, in the population. Accurate, reliable morbidity data are more difficult and costly to collect, compared to mortality data. Without some kind of disease registry, incidence data are not available for CVD. Prevalence data on CVD can be obtained from the Behavioral Risk Factor Surveillance System, hospital visit data, and (for certain population groups) procedures/reimbursement data. However, no statewide hospital discharge data system exists in Mississippi, and there are currently no plans to obtain such data. It might be possible to undertake, as a pilot study, limited surveillance of CVD hospital visit data in the Jackson metro tri-county area (as has been done recently with asthma). Procedures/reimbursement data could also be examined (for example: Medicare, Medicaid, Blue Cross) but to date these sources have not been used.

Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is a statewide random-digit-dialed telephone survey on health and health care behaviors that Mississippi has conducted since 1990. It utilizes data from a representative sample of the Mississippi civilian non-institutionalized adult population (18 years of age and older). The overall sample size for 1990-97 varied between 1,578 and 1,599 persons; in 1998, the sample was increased to 2,307 persons and in 2003 was 4,085. The BRFSS is the only instrument for state-level surveillance of chronic diseases, health risk behaviors, and health care practices among adult Mississippians. The main limitation is the self-reporting of all data. Also, gaps in coverage are well recognized – persons living in rural areas, especially the Delta, are undersampled due to lack of phones. Data on CVD morbidity has been collected through the use of additional modules of questions, beginning in 1998; the schedule through 2007 is given in Table 3. From the CVD module questions, an estimate of the prevalence (percent of population) of heart attack, angina, and stroke can be determined; also, the frequency of physician counseling and of actions taken to lower CVD risk can be calculated. From the Heart Attack and Stroke module questions, knowledge of heart attack and stroke symptoms and signs can be estimated.

CVD Risk Factor Registry

A CVD risk factor registry will be developed in collaboration with Information and Quality Healthcare and other statewide entities. The intent of the registry is to capture population based data that can be tracked over time to assess the impact of strategies included in the *Plan*.

Table 3. Schedule for Mississippi BRFSS Modules and Core Questions on CVD

Modules	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CVD		●	●	●	●	●	●		●		●
Heart Attack & Stroke Symptoms								●	●	●	
Hypertension	X							To be determined			
Cholesterol											
Core questions											
Hypertension	●		●		●		●	X			
Cholesterol	●		●		●		●				

● =Survey conducted; X =No survey data being collected; = No survey conducted

Risk Factors for Cardiovascular Disease

By definition, a risk factor for CVD is a condition or behavior that increases a person's risk of developing CVD; the risk factor is often directly involved in causing the CVD, though this is not always necessary. Some risk factors are "modifiable"; in other words, the risk factor can be controlled or reduced, and the risk of developing CVD lessened. Risk factors for CVD that cannot be changed are age (CVD mortality rates increase as age increases), gender (males have higher CVD mortality rates than women, especially before menopause), race (African Americans generally have higher rates than whites – it is not known whether it is related to genetics, socioeconomic status, or race related issues), family history of CVD at an early age, and previous medical history of CVD. The main modifiable risk factors are smoking, high blood pressure, high blood cholesterol levels, diabetes, overweight/obese, and lack of regular physical activity/exercise. BRFSS prevalence data on these are available for Mississippi since 1990 (see schedule of BRFSS questions in previous table). Risk factor prevalence data are also available for public high school students in the state from the Youth Risk Behavior Survey and Youth Tobacco Survey.

Youth Risk Behavior Survey (YRBS)

The YRBS is a self-administered questionnaire survey of public high school students (grades 9-12) in Mississippi. It was conducted in 1990 and thereafter, beginning in 1993, in alternate years, with a sample size of more than 1,800 high school students in 2001 and 2003. (Beginning with the 2001 YRBS, middle schools (grades 6-8) have also been sampled. These data have not been distributed widely because their validity and reliability are not yet clearly established.) MSDH has always managed to maintain an overall survey response rate greater than 60 percent, allowing weighted estimates to be developed. This is important because the survey results can then be regarded as representative of all public high school students in the state.

The Mississippi YRBS is the only instrument for measuring and monitoring health risk behaviors among adolescents in the state, and provides data on CVD-related risk behaviors such as smoking, overweight, and physical activity. Similar limitations apply to YRBS data as to BRFSS data. No data are collected on children in elementary schools (grades 1-5) and private/parochial schools, or on home-schooled students.

The Youth Tobacco Survey (YTS)

More detailed data on knowledge, attitudes, and behaviors related to tobacco use are available from the YTS, which is, like the YRBS, a self-administered questionnaire survey of public and private high and middle school students in Mississippi. It has been conducted according to the following schedule, beginning in 1998 (Table 4):

Table 4. Schedule for Mississippi YTS

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Public MS	U	U	U		U	U	To be determined			
Private MS			U		U	U				
Public HS	U	U	U		U	U				
Private HS	U	U	U		U	U				

MS=middle school HS=high school

U=Survey conducted; =Survey not conducted

Social Environmental Determinants of CVD

Behavioral and lifestyle factors such as regular physical activity or exercise and a ‘heart-healthy’ diet are important individual-level risk factors for preventing the development of, and mortality from, CVD. However, social and environmental determinants of CVD are also important, such as the availability of:

1. public (non-paying) parks, bike paths, and walking trails (and walking routes in malls, shopping centers);
2. exercise and recreational facilities, including swimming pools;
3. restaurants with ‘heart-healthy’ choices on the menu;
4. smoke-free restaurants.

Lack of availability of such facilities may be important barriers to cardiovascular health. Additional barriers include:

1. the widespread availability of fast-food facilities, which offer inexpensive, high-fat food;
2. lack of available, affordable ‘heart-healthy’ foods in shops and supermarkets.

Over the past two years, staff of the MSDH Epidemiology Office and students from Jackson State University have carried out a number of surveys of social environmental determinants of CVD in the Jackson metro tri-county area. The results have been published elsewhere and are available on the MSDH website. The Office of Epidemiology will continue to seek resources and partners to continue such surveys and expand them to other metro areas in the state. In addition, future surveys are planned:

1. to assess school nutrition policies, lunch programs, and vending machine policies; and
2. to assess school guidelines and policies regarding physical education curricula.

Evaluation

Monitoring and evaluation is a central component of the *Plan*. The purpose of the evaluation is to determine if the intended outcome was met and to document strengths and weaknesses of the *Plan's* strategies for making future decisions, future planning, and restructuring. Benefits of the evaluation will include improving intervention components and enhancing staff performance. It will also serve as a mechanism to share what works and what does not work with stakeholders, including the communities in which we seek to increase healthy lifestyle choices via policy and environmental supports. Moreover, an evaluation process that includes the community will ensure sustainability and longevity within intervention communities. The evaluation will determine the needs for improvement of program operations, provide pertinent data for decision-making, and help set priorities.

Evaluation of the *Plan* will consist of process and outcome evaluations. The evaluation will be an ongoing process to determine the effectiveness of strategies. Initially, the evaluation process will focus mainly on process since the outcome measures – mortality and morbidity – are long range. The process evaluation will answer the questions: “What was actually done?”, “How was it done?”, “When was it done?”, “For whom was it done?”, and “By whom was it done?” to ensure that interventions are implemented as stated in the *Plan*. The outcome evaluation will attempt to determine the congruence between performance (what occurred) and objectives (what was supposed to occur). It will answer the question: “Was the *Plan* effective?”. The outcome evaluation will be designed to examine the long-term effects of the *Plan* in terms of morbidity and mortality rates.

Process Evaluation

The process evaluation will determine to what extent the strategies have been implemented and how they can be better implemented. This will involve input from various stakeholders including program staff and populations affected by these strategies. Indicators for process measures may include:

- accounting for the provision of mini-grants to communities to develop environmental and structural supports for health;
- the number of health educators providing information to local coalitions and other community-based organizations regarding policy/environmental changes for chronic disease risk reduction;
- number and types of venues and other public institutions that promote the *Know Your Numbers* campaign material.

Outcome Evaluation

The purpose in this evaluation stage is to determine the impact the *Plan* has had on the state. Outcome will be the final component of the evaluation phase. The purpose of outcome evaluation is to determine the health status and quality of life indicators in terms of morbidity, mortality, and disability rates related to CVD. To gather this information, BRFSS, YRBS, and YTS data sources will be used in addition to vital statistics. This evaluation will occur

throughout the end of this ten-year document time frame. Examples for outcome measures will include:

1. number of communities with additional walking trails;
2. number of worksites that implement health promotion programs;
3. number of schools with comprehensive physical education/activity programs.
4. number of deaths attributable to CVD;
5. percentage of people who are overweight/obese; and
6. percentage of CVD related deaths that are premature.

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Healthy People 2010 Objectives Related to Heart Disease and Stroke

- 12.1 Reduce coronary heart disease deaths.
- 12.2 Increase the proportion of adults aged 20 years and older who are aware of the early warning signs and symptoms of a heart attack and the importance of accessing rapid emergency care by calling 911.
- 12.3 Increase the proportion of eligible patients with heart attacks who receive artery-opening therapy within an hour of symptom onset.
- 12.4 Increase the proportion of adults aged 20 years and older who call 911 and administer cardiopulmonary resuscitation (CPR) when they witness an out-of-hospital cardiac arrest.
- 12.5 Increase the proportion of eligible persons with witnessed out-of-hospital cardiac arrest who receive their first therapeutic electrical shock within six minutes after collapse recognition.
- 12.6 Reduce hospitalizations of older adults with congestive heart failure as the principal diagnosis.
- 12.7 Reduce stroke deaths.
- 12.8 Increase the proportion of adults who are aware of the early warning signs and symptoms of a stroke.
- 12.9 Reduce the proportion of adults with high blood pressure.
- 12.10 Increase the proportion of adults with high blood pressure whose blood pressure is under control.
- 12.11 Increase the proportion of adults with high blood pressure who are taking action (for example, losing weight, increasing physical activity, or reducing sodium intake) to help control their blood pressure.
- 12.12 Increase the proportion of adults who have had their blood pressure measured within the preceding two years and can state whether their blood pressure was normal or high.
- 12.13 Reduce the mean total blood cholesterol levels among adults.
- 12.14 Reduce the proportion of adults with high total blood cholesterol levels.
- 12.15 Increase the proportion of adults who have had their blood cholesterol checked within the preceding five years.
- 12.16 Increase the proportion of persons with coronary heart disease who have their LDL-cholesterol level treated to a goal of less than or equal to 100mg/dL.

Other Healthy People 2010 Objectives Related to Cardiovascular Health

- 1.2 Increase the proportion of insured persons with coverage for clinical preventive services.
- 1.3a Increase the proportion of persons appropriately counseled about health behaviors, i.e., physical activity or exercise (adults aged 18 years and older).
- 1.3b Increase the proportion of persons appropriately counseled about health behaviors, i.e., diet and nutrition (adults aged 18 years and older).
- 1.3c Increase the proportion of persons appropriately counseled about health behaviors, i.e., smoking cessation (adult smokers aged 18 years and older).
- 1.3d Increase the proportion of persons appropriately counseled about health behaviors, i.e., reduced alcohol consumption (adults aged 18 years and older with excessive alcohol consumption).
- 1.3h Increase the proportion of persons appropriately counseled about health behaviors, i.e., management of menopause (females aged 46 to 56 years).

- 1.10 Reduce the proportion of persons who delay or have difficulty in getting emergency medical care.
- 1.11 Increase the proportion of persons who have access to rapidly responding prehospital emergency medical services.
- 5.7 Reduce deaths from cardiovascular disease in persons with diabetes.
- 5.12 Increase the proportion of adults with diabetes who have a glycosylated hemoglobin measurement at least once a year.
- 5.16 Increase the proportion of persons with diabetes who take aspirin at least 15 times per month.
- 7.5b Increase the proportion of worksites with 50 or more employees that offer a comprehensive employee health promotion program to their employees.
- 7.6 Increase the proportion of employees who participate in an employer-sponsored health promotion activity.
- 19.5 Increase the proportion of persons aged two years and older who consume at least two daily servings of fruit.
- 19.6 Increase the proportion of persons aged two years and older who consume at least three daily servings of vegetable, with at least one-third being dark green or orange vegetables.
- 19.8 Increase the proportion of persons aged two years and older who consume less than 10 percent of calories from saturated fat.
- 19.9 Increase the proportion of persons aged two years and older who consume no more than 30 percent of calories from total fat.
- 19.10 Increase the proportion of persons aged two years and older who consume 2,400 mg or less of sodium daily.
- 19.11 Increase the proportion of persons aged two years and older who meet dietary recommendations for calcium.
- 19.15 Increase the proportion of children and adolescents aged 6 to 19 years whose intake of meals and snacks at school contribute to good overall dietary quality.
- 19.16 Increase the proportion of worksites that offer nutrition or weight management classes or counseling.
- 19.17 Increase the proportion of physician office visits made by patients with a diagnosis of cardiovascular disease, diabetes, or hyperlipidemia that include counseling or education related to diet and nutrition.
- 22.1 Reduce the proportion of adults who engage in no leisure-time physical activity.
- 22.2 Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day.
- 22.6 Increase the proportion of adolescents who engage in moderate physical activity for least 30 minutes on five or more of the previous seven days.
- 22.8 Increase the proportion of the nation's public and private schools that require daily physical education for all students.
- 22.9 Increase the proportion of adolescents who participate in daily school physical education.
- 22.11 Increase the proportion of adolescents who view television two or fewer hours on a school day.
- 22.12 Increase the proportion of the nation's public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and after the school day, on weekends, and during summer and other vacations).

- 22.13 Increase the proportion of worksites offering employer-sponsored physical activity and fitness programs.
- 22.14 Increase the proportion of trips made by walking.
- 22.15 Increase the proportion of trips made by bicycling.
- 27.1 Reduce tobacco use by adults.
- 27.2 Reduce tobacco use by adolescents.
- 27.8 Increase insurance coverage of evidence-based treatment for nicotine dependency.
- 27.10 Reduce the proportion of nonsmokers exposed to environmental tobacco smoke.
- 27.12 Increase the proportion of worksites with formal smoking policies that prohibit smoking or limit it to separately ventilated areas.
- 27.19 Eliminate laws that preempt stronger tobacco control laws.
- 27.21 Increase the average Federal and State tax on tobacco products.