EXECUTIVE SUMMARY

Purpose of the plan: To chart a course for the Centers for Disease Control and Prevention (CDC) and collaborating public health agencies, with all interested partners and the public at large, to help in promoting achievement of national goals for preventing heart disease and stroke over the next two decades—through 2020 and beyond.

Heart disease and stroke are among the nation's leading causes of death and major causes of disability, projected to cost more than $351 billion in 2003. In the next two decades, these conditions can be expected to increase sharply as this country's "baby boom" generation ages. The current disease burden, recent trends, and growing disparities among certain populations reinforce this projection.

Yet these conditions are largely preventable. As expressed in the *Steps to a HealthierUS* initiative from Secretary of Health and Human Services Tommy G. Thompson, the long-term solution for our nation's health care crisis requires embracing prevention as the first step. To reverse the epidemic of heart disease and stroke through increasingly effective prevention, action is needed now.

A Public Health Action Plan to Prevent Heart Disease and Stroke addresses this urgent need for action. Key partners, public health experts, and heart disease and stroke prevention specialists came together to develop targeted recommendations and specific action steps toward achievement of this goal, through a process convened by CDC and its parent agency, the U.S. Department of Health and Human Services (HHS).

CDC and public health partners will provide national leadership to assure meaningful progress in implementing the plan. This includes bringing the public health community together with new and existing partners representing every interested segment of society. An important aspect of this process is continuing coordination between CDC and the National Institutes of Health (NIH), HHS, which is the co-lead agency with CDC for the heart disease and stroke focus area of *Healthy People 2010*.

Today, support for public health programs to prevent heart disease and stroke remains low, constituting less than 3% of the aggregate budget of our state public health agencies. Despite substantial public health gains in recent years, the failure to halt and reverse the epidemic has been extremely costly. Numbers of victims and health care expenses will only escalate unless the epidemic is reversed.

Fortunately, a new promise of success exists today. We have knowledge from decades of research and experience, especially because of the contributions of NIH and the American Heart Association. We also have a growing commitment to prevention, exemplified by the Secretary's *Steps to a HealthierUS* initiative. And we have the potential collaboration of many major national partners.

The *Action Plan* represents a comprehensive public health strategy to assist in addressing the *Healthy People 2010* goal of improving cardiovascular health through the prevention, detection, and treatment of risk factors; early identification and treatment of heart attacks and strokes; and prevention of recurrent cardiovascular events. This strategy depends on a balanced investment in all available intervention approaches, from policy and environmental changes designed to prevent risk factors to assurance of quality care for the victims of heart disease and stroke, and it includes education to support individual efforts to prevent or control risk factors.

To successfully implement the plan, two fundamental requirements must be met. First, we must communicate to the public at large and to policy makers the urgent need and unprecedented opportunity to prevent heart disease and stroke. Second, we must transform the nation's public health infrastructure to provide leadership and to develop and maintain effective partnerships and collaborations to support the needed actions.

The five essential components of this plan are taking action, strengthening capacity, evaluating impact, advancing policy, and engaging in regional and global partnerships. In these five areas, 22 recommendations and supporting action steps are proposed for implementation over the course of this long-term plan. In summary form, these recommendations are as follows:

- Develop new policies in accordance with advances in science and implement new intervention programs in a timely manner in multiple settings, for all age groups, for whole populations, and especially for high-risk groups, on a scale sufficient to have measurable impacts.

- Strengthen public health agencies and create training opportunities, model standards, and resources for continuous technical support for these agencies and their partners.

- Enhance data sources and systems to monitor key indicators relevant to heart disease and stroke prevention and to systematically evaluate policy and program interventions.

- Foster research on policies and public health programs aimed at preventing atherosclerosis and high blood pressure, especially at the community level. Continue to evaluate the public health role of genetic and other biomarkers of risk. Develop innovative ways to evaluate public health interventions, particularly those related to policy and environmental change and population-wide health promotion.

- Work with regional and global partners to reap the full benefit of sharing knowledge and experience in heart disease and stroke prevention with these partners.

The next step is to develop a detailed implementation plan—first setting priorities, then assessing the potential alignment of proposed action steps with the interests of individual partners, adopting short- and long-term time lines, and formulating feasible approaches for evaluation. CDC is committed to providing leadership and support to convene these ongoing efforts, inviting all interested partners to collaborate in action areas congruent with their own interests.

OVERVIEW

Heart disease and stroke are epidemic in the United States and elsewhere.[1,2] In the next two decades, these largely preventable conditions are projected to increase sharply in numbers as this country's "baby boom" generation ages.[3,4] The message is urgent—action is needed now to reverse the epidemic of heart disease and stroke.

Every 29 seconds, someone will suffer a coronary event in the United States.
Every 60 seconds, someone will die from such an event.

A Comprehensive Public Health Strategy

Effective action will require a comprehensive public health strategy and a sustained commitment to its implementation. *A Public Health Action Plan to Prevent Heart Disease and Stroke* addresses these requirements. CDC invited participants to develop the plan, in keeping with its responsibility for undertaking activities to help move the nation toward achievement of the goal for heart disease and stroke prevention under *Healthy People 2010*.[5]

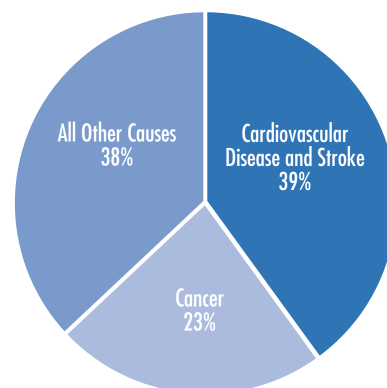
Every 45 seconds, someone will suffer a new or recurrent stroke.
Every 3.1 minutes, someone will die from a stroke.

This followed designation of CDC as co-lead agency for this focus area, joining the National Institutes of Health (NIH), which had sole responsibility for this area previously. NIH, with CDC and other partners, participated in the Working Group that guided the planning process. In addition, public health experts and heart disease and stroke prevention specialists in the United States and abroad were asked to participate in the Working Group, one of five Expert Panels, or a National Forum.

Many people believe that cardiovascular disease only affects men and older people. But heart disease and stroke are among the leading causes of death for U.S. women and men in all racial and ethnic groups, and sudden cardiac deaths have increased dramatically among people younger than age 35.

For the Expert Panels, each of which was chaired by an extramural public health expert, 45 national and international experts contributed to formulation of the recommendations and proposed action steps. For the Working Group, which also was chaired by an extramural public health expert, 20 national and international experts served. For the National Forum, which was presided over by the chair of the Working Group, 81 individuals representing 66 national and international organizations and agencies other than CDC participated. With technical support from CDC, these groups developed the substance of the plan. These activities occurred from December 2001 through September 2002.

The resulting plan belongs to all who wish to use it. For successful implementation, public health agencies and the overall public health community must join with new and existing partners representing every interested segment of society. CDC and other public health agencies will provide leadership for working with partners to assure that meaningful progress is made. Participation is welcomed from all who wish to contribute. Continuing collaboration with NIH as co-lead agency will be important.



Causes of Death for all Americans in the United States, 2000

The Challenge

Despite the major progress in reducing death rates from heart disease and stroke, their total impact has increased in the past 50 years according to many health status indicators.[1,6] In the United States, growing

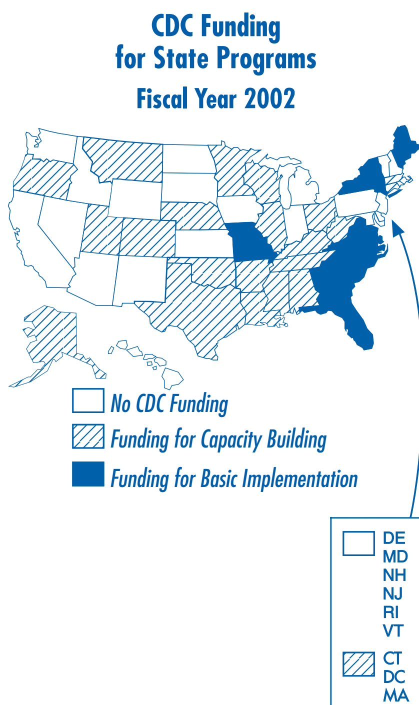
numbers of people are dying from these conditions or surviving with disability, dependency, and high risk for recurrence. During the 1990s, although the overall death rate for these conditions declined 17.0%, the actual number of deaths increased 2.5%. This reflects, in part, growth in the population over age 65, which has the highest rates and therefore contributes most to the mounting numbers of deaths each year.[7]

In 2002, CDC funded cardiovascular disease prevention programs in 29 states and the District of Columbia. The Heart Disease and Stroke Prevention Program is designed to reduce disparities in treatment, risk factors, and disease; delay the onset of disease; postpone death; and reduce disabling conditions. The goal is a national program with sufficient funding for every state.

As a result, heart disease remained the nation's leading cause of death in 2000 for women and men and for nearly every racial and ethnic group. Stroke is the third leading cause of death, and both conditions are major causes of disability for people 65 and older, as well as for many younger adults. Thus, the importance of these conditions is not restricted to the older population, though the number of victims at older ages are especially great. Risk factors such as diabetes have increased sharply, even for younger people.[8] Growing health disparities place certain populations, especially racial or ethnic minorities and people of low income or education, at excess risk relative to groups with the most favorable rates of heart disease and stroke.[9–12] Aging of the baby boom generation portends a sharp rise by 2020 in the number of people who die from heart disease and stroke or survive with dependency.[3,4]

Clearly, heart disease and stroke contribute substantially to the nation's health care crisis, as addressed by Secretary of Health and Human Services Tommy G. Thompson in his initiative, *Steps to a HealthierUS*. This initiative places an important new emphasis on prevention of chronic diseases and conditions.

CDC Funding for State Programs Fiscal Year 2002



The epidemic of heart disease and stroke can be expected to continue, with an increasing burden and widening disparities, unless unprecedented public health efforts are mounted to arrest and reverse it. This challenge will test the ability of public health institutions at all levels to fulfill their obligation to protect society against this rising epidemic. Three factors affect the current challenge.

- **Support for public health programs to prevent heart disease and stroke is low.** State public health agencies expend less than 3% of their budgets on chronic disease programs, including heart disease and stroke prevention.[7]
- **The costs of failure are very high.** The economic costs of heart disease and stroke rise each year. These costs include the numbers of people requiring treatment for risk factors or early signs of disease; emergency treatment for first or recurrent episodes of heart attack, heart failure, or stroke; and efforts to reduce disability and prevent recurrent episodes. In 2003, health care costs alone are projected to be $209.3 billion. Although personal and societal costs are incalculable, they include another $142.5 billion in lost productivity.[1] These costs will escalate further if this epidemic is not halted and reversed. As noted by Secretary Thompson, chronic diseases and conditions, including heart disease, consume more than 75% of our nation's health care dollars, yet they are largely preventable.
- **An unprecedented opportunity to prevent heart disease and stroke exists today in the United States.** We know what causes

these conditions and how to prevent them, largely because of the decades of research supported by NIH, the American Heart Association, and others.[6] *Healthy People 2010* has outlined clear goals, and the Healthy People 2010 Heart and Stroke Partnership* was established to help in achieving them.[5] Also, health professionals have become more aware of the need for immediate action as they increasingly recognize the continuing cardiovascular epidemic, recent unfavorable trends, and forecasts of a mounting disease burden.[8]

The Public Health Response

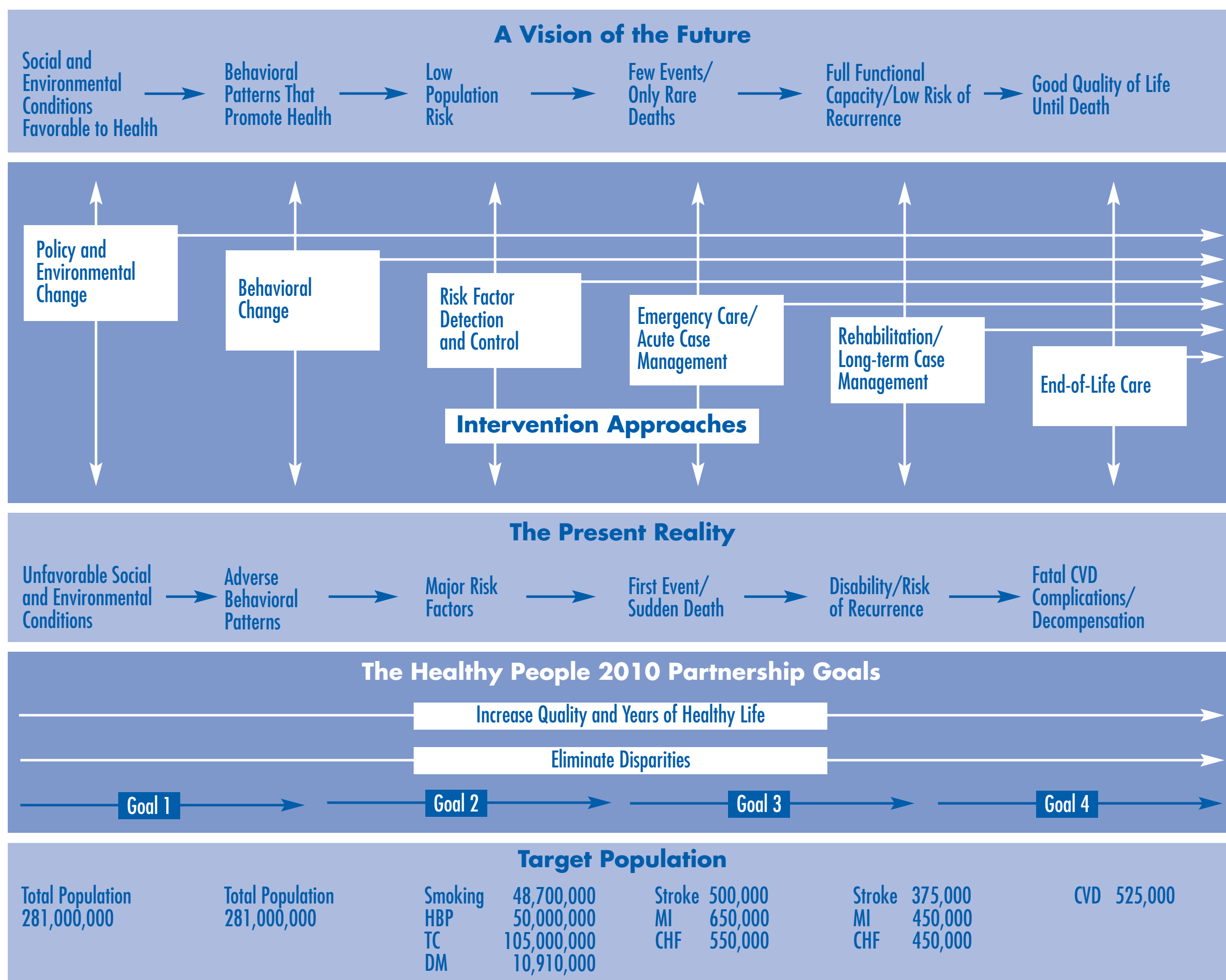
Substantial public health achievements have been made in preventing heart disease and stroke, but they are insufficient to arrest or reverse the epidemic. Public health serves society by guaranteeing conditions of life in which people can be healthy and by addressing three core functions—assessment, policy development, and assurance.[13] Achievements in these areas as they relate to heart disease and stroke[6] include the following:

- **Assessment.** For several decades, public health agencies and researchers have collected data on the epidemic and conducted research on how to control it. Although important gaps persist, the accumulated knowledge provides a solid evidence base for public health decision making.
- **Policy development.** A wealth of policies has been developed on the basis of this knowledge. Some policies have been implemented effectively but await broader, more intensive application to achieve their full impact. Others have yet to be acted upon. Evaluating these policies requires implementation on a sufficient scale and adequate resources for evaluation.
- **Assurance.** Assurance, measured by how much society is protected from epidemic heart disease and stroke, remains to be achieved despite recent progress. Public health agencies can put current knowledge to work through a targeted plan of action. Unfortunately, most public health agencies are not yet well-equipped for this task.[13]

The U.S. Department of Health and Human Services (HHS) and its component agencies, including NIH and especially its National Heart, Lung, and Blood Institute and National Institute of Neurological Disorders and Stroke, represent a long history of research and program development in the area of heart disease and stroke for both health professionals and the public. It is beyond the scope of this document to inventory the contributions of even one agency, much less those of HHS as a whole, but it is important to recognize that today's knowledge base about prevention of heart disease and stroke is, to a large degree, a reflection of this work. Other organizations, especially the American Heart Association, also have supported research that has led to the kinds of policy developments—often in partnership with others, such as the American College of Cardiology—that underlie the present opportunity

The *Steps to a HealthierUS* initiative envisions a healthy, strong United States where diseases are prevented when possible, controlled when necessary, and treated when appropriate. This initiative is a bold shift in our approach to the health of our citizens, moving us from a disease care system to a health care system. We can no longer sustain the skyrocketing health care costs created by an over reliance on treatment, nor should Americans continue to suffer from preventable diseases.

* Current partners include the American Heart Association/American Stroke Association, CDC, Centers for Medicare & Medicaid Services, Indian Health Service, NIH, and Office of Public Health and Science, U.S. Department of Health and Human Services.



Note: Healthy People 2010 goals are explained in the text. HBP = high blood pressure, TC = total cholesterol, DM = diabetes mellitus, MI = myocardial infarction, CHF = congestive heart failure, CVD = cardiovascular disease.

Figure 1. Action Framework for a Comprehensive Public Health Strategy to Prevent Heart Disease and Stroke (see the inside back cover for a color version of this figure)

for heart disease and stroke prevention. CDC has contributed in this area for many years through its laboratory standardization, surveillance, and vital statistics activities, as well as through more recent public health program implementation.

In the context of this HHS tradition, Secretary Thompson's *Steps to a HealthierUS* initiative is a significant new development. It calls for marshalling all available resources within HHS and for action by other federal agencies, such as transportation, agriculture, and education, and private-sector interests, such as the food industry and many others. All are urged to take steps to improve the nation's health. Further, this initiative calls on policy makers to embrace prevention as the first step toward solving our nation's health care crisis. Clearly, it is understood that business as usual will not be sufficient to meet today's challenges in addressing chronic diseases and conditions, including heart disease and stroke.

The *Action Plan*

The *Action Plan* embraces the two overarching goals of *Healthy People 2010*, which are to increase quality and years of healthy life and to eliminate health disparities.[5] It also addresses four goals specific to heart disease and stroke, as distinguished by the Healthy People 2010 Heart and Stroke Partnership according to the different intervention approaches that apply. These goals (which are based on the one *Healthy People 2010* goal) are prevention of risk factors, detection and treatment of risk factors, early identification and treatment of heart attacks and strokes, and prevention of recurrent cardiovascular events. An action framework that outlines the comprehensive public health strategy of the *Action Plan* (see Figure 1) highlights these goals. The main features of the action framework can be described briefly as follows (see full report for further discussion):

- **The Present Reality**, which summarizes current knowledge of the progressive development of heart disease and stroke.
- **A Vision of the Future**, which summarizes the favorable circumstances that must be achieved if the epidemic of heart disease and stroke is to be arrested and reversed.
- **Intervention Approaches**, which include the six broad approaches that, when fully and effectively implemented, can help bring about the transition to the vision of the future.
- **Healthy People 2010 Partnership Goals** for reducing heart disease and stroke and how the six intervention approaches can address successive stages of disease and help attain these goals.
- **Target Population**, which indicates how many people could be reached by each successive intervention approach.

"We have the scientific knowledge to create a world in which most cardiovascular disease could be eliminated."

From *The 2000 Victoria Declaration on Women, Heart Diseases and Stroke*

This public health strategy is based on the concept of pursuing the *Healthy People 2010* goal for preventing heart disease and stroke by applying the full array of intervention approaches. For this *Action Plan*, participants proposed specific recommendations after identifying public health areas critical to preventing heart disease and stroke. Five such areas were established as essential components of the plan (see Figure 2, next page). For each component, CDC convened an Expert Panel to consider the relevant issues and recommend action steps through which to address them. Detailed implementation plans will be developed in each area subsequently, guided by the overall plan.

The Utah Cardiovascular Health Program partnered with 140 organizations representing government, private businesses, health care organizations, and nonprofit agencies to form the Alliance for Cardiovascular Health. This group has developed a 3-year plan to identify key strategies for improving cardiovascular health, including policy and environmental change.

The five components and their respective panels are summarized as follows:

- **Taking action**. Translating current knowledge into effective public health action (Expert Panel A).
- **Strengthening capacity.** Transforming public health agencies with new competencies and resources and expanding partnerships to mount and sustain such action (Expert Panel B).
- **Evaluating impact.** Systematically monitoring and evaluating the health impact of interventions to identify and rapidly disseminate those most effective (Expert Panel C).

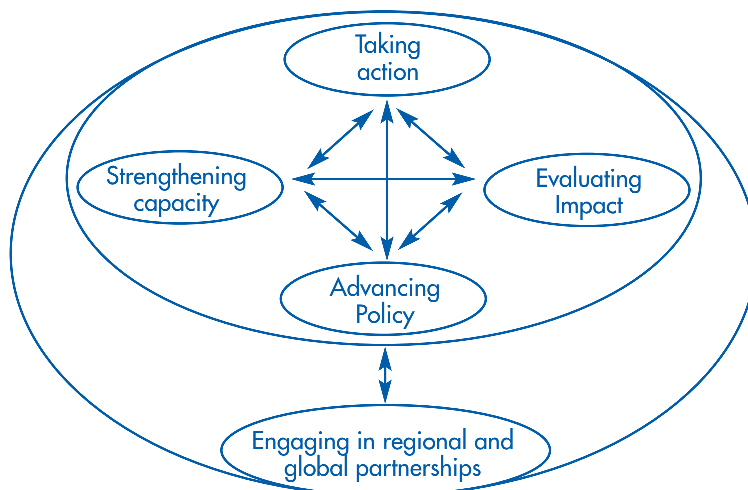


Figure 2. An Integrated Action Plan to Prevent Heart Disease and Stroke

- **Advancing policy.** Defining the most critical policy issues and pursuing the needed prevention research to resolve them and expedite policy development (Expert Panel D).
- **Engaging in regional and global partnerships.** Multiplying resources and capitalizing on shared experience with others throughout the global community who are addressing similar challenges (Expert Panel E).

African Americans are more adversely affected by heart disease and stroke than any other racial group in the United States. To combat this disparity, the Association of Black Cardiologists is conducting a public education campaign called *Children Should Know Their Grandparents: A Guide to a Healthy Heart*. This program encourages healthy lifestyle choices to prevent heart disease and stroke and stresses the importance of sharing family medical histories.

The Expert Panels proposed specific recommendations and action steps for implementing the plan over the next two decades and beyond. For this Overview, the full list of recommendations was synthesized into two fundamental requirements and 10 summary recommendations.

Fundamental Requirements

- **We must communicate to the public at large and to policy makers the urgent need and unprecedented opportunity to prevent heart disease and stroke in order to establish widespread awareness and concern about these conditions, as well as confidence in the ability to prevent and control them.**

  An effective, comprehensive public health strategy to prevent heart disease and stroke depends on widespread understanding of three basic messages. Heart disease and stroke threaten the health and well-being of all Americans, especially during the middle and older adult years. Prevention is possible by reversing community-acquired behaviors, risks, and health disparities. Failure to intensify preventive efforts now will sharply escalate the future burden and cost of these conditions. To effectively implement this plan, we must communicate these and other clear messages through appropriate channels, with support from appropriate partners. A communications infrastructure is needed that includes public health agencies at all levels, tribal and other governmental agencies, the private sector (e.g., voluntary and faith-based associations, professional and business groups, media, foundations), and broad community participation.

- **We must transform the nation's public health infrastructure to provide leadership and to develop and maintain effective partnerships and collaborations for the action needed.**

  Such changes, which will be elaborated in a detailed implementation plan, will enable public health leaders to bring together the array of partners needed to prevent heart disease and stroke. These changes will also lead public health agencies to recognize and aggressively emphasize the policy and environmental changes and population-wide information and education needed for health behavior change.

Summary Recommendations

1. **Develop policies for preventing heart disease and stroke at national, state, and local levels to assure effective public health action, including new knowledge on the efficacy and safety of therapies to reduce risk factors. Implement intervention programs in a timely manner and on a sufficient scale to permit rigorous evaluation and the rapid replication and dissemination of those most effective.**

   Active intervention is needed continually to develop and support policies (both in and beyond the health sector) that are favorable to health, change those that are unfavorable, and foster policy innovations when gaps are identified. Policies that adversely affect health should be identified because they can be major barriers to the social, environmental, and behavioral changes needed to improve population-wide health.

2. **Promote cardiovascular health and prevent heart disease and stroke through interventions in multiple settings, for all age groups, and for the whole population, especially high-risk groups.**

   This recommendation defines the scope of a comprehensive public health strategy to prevent heart disease and stroke. Such a strategy must 1) emphasize promotion of desirable social and environmental conditions and favorable population-wide and individual behavioral patterns to prevent major risk factors and 2) assure full accessibility and timely use of quality health services among people with risk factors or disease.

3. **Strengthen public health agencies to assure that they develop and maintain sufficient capacities and competencies, including their laboratories.**

   Public health agencies at state and local levels should establish specific programs designed to promote cardiovascular health and prevent heart disease and stroke. Skills are required in the new priority areas of policy and environmental change, population-wide health promotion through behavioral change, and risk factor prevention. Public

"At no time in the history of this nation has the mission of promoting and protecting the public's health resonated more clearly with the public and the government than now. To improve health in our communities, we need high-quality and well-educated public health professionals."

From *Who Will Keep the Public Healthy? Educating Public Health Professionals for the 21st Century,* Institute of Medicine, 2002

"To reach minority populations, the American Heart Association created Search Your Heart. This faith-based program is established primarily in the inner cities for the medically underserved, high-risk segment of our population. Important cardiovascular health messages are delivered through the 5,000 places of worship enrolled in this program nationwide."

Robert O. Bonow, MD, President, American Heart Association

health agencies must also be able to manage and use health data systems to effectively monitor and evaluate interventions and prevention programs. Laboratory capacity and standardization must be maintained to address new and continuing demands and opportunities.

The Oklahoma Cardiovascular Health Program has developed rules to help emergency and hospital workers better serve stroke patients, based on American Heart Association and National Stroke Association guidelines.

4. Create opportunities for training, offer model standards for preventing chronic diseases, and make consultation and technical support continuously available to public health agencies, including their laboratories.

This plan demands new skills and competencies that can only be met through new training opportunities (see full document for details). Public health agencies can fulfill their responsibilities and function effectively in the new era of diverse partnerships by taking advantage of these opportunities.

5. Define criteria and standards for population-wide health data sources. Expand these sources as needed to assure adequate long-term monitoring of population measures related to heart disease and stroke.

Such measures include mortality, incidence, and prevalence rates; selected biomarkers of CVD risk; risk factors and behaviors; economic conditions; community and environmental characteristics; sociodemographic factors (e.g., age, race/ethnicity, sex, place of residence); and leading health indicators. Appropriate criteria and standards can be defined through a national meeting of key stakeholders. In addition, they must conform to the National Health Information Infrastructure (www.health.gov/ncvhs-nhii) and the Standards for Privacy of Individually Identifiable Health Information, also called the Privacy Rule (www.hhs.gov/ocr/hipaa).

The state-based Behavioral Risk Factor Surveillance System (BRFSS) is the largest telephone survey tool in the world. Data have been collected on the public's knowledge of the signs and symptoms of heart attack and stroke, their access to and participation in health care, and other issues related to quality of life. BRFSS data help health care professionals and policy makers effectively address the needs of specific populations and geographic areas.

6. Upgrade and expand health data sources to allow systematic monitoring and evaluation of policy and program interventions.

To learn what works best, all programs funded by public health agencies should allocate resources for evaluation upfront, and staff must be trained to develop and apply evaluation methods. The resulting data must be communicated effectively to other agencies and to policy makers.

7. Emphasize the critical roles of atherosclerosis and high blood pressure, which are the dominant conditions underlying heart disease and stroke, within a broad prevention research agenda.

Prevention research on policy, environmental, and sociocultural determinants of risk factors, as well as potentially useful genetic and other biomarkers of risk, is critical, as is rapid translation of this information into health care practice. Policy makers must understand the value of such research. Such research should focus especially on children and adolescents because atherosclerosis and high blood

pressure can begin early in life. The prevention research agenda should be developed and updated collaboratively among interested parties, taking current and planned research programs into account.

8. **Develop innovative ways to monitor and evaluate policies and programs, especially for policy and environmental change and population-wide health promotion.**

   Public health agencies and their partners should conduct and promote research to improve surveillance methods in multiple areas, settings, and populations. Marketing research can be used to evaluate public knowledge and awareness of key health messages and to update these messages over time. Methodological research can help assess the impact of new technologies and regulations on surveillance systems.

9. **Reap the full benefit of shared knowledge and experience from regional and global partners through information exchange in the area of heart disease and stroke prevention.**

   Such communication will promote productive interactions among public health agencies in the United States and their counterparts elsewhere in the world addressing similar challenges. As a result, this nation will benefit from the investment of others by gaining valuable knowledge and experience in public health approaches to heart disease and stroke prevention.

10. **Work with regional and global partners to develop prevention policies, formulate strategies for use of global media for health communications, and assess the impact of globalization on cardiovascular health.**

    With these partners, the U.S. public health community can explore new ways to enhance the skills and resources of global health agencies, apply new methods for monitoring and evaluating interventions, and further research by fostering replication of studies in diverse settings.

Implementation

Immediate action is needed to prevent heart disease and stroke. To initiate and sustain this action, commitment is needed from national, state, and local public health agencies; tribal organizations; and others within and beyond the health sector. Implementation of the *Action Plan* should complement other activities in pursuit of the *Healthy People 2010* goal for preventing heart disease and stroke and be appropriately coordinated with the existing Healthy People 2010 Heart and Stroke Partnership. The complete *Action Plan* can be reviewed at www.cdc.gov/cvh.

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