Chronic Disease Notes & Reports

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Special Focus: Heart Disease and Stroke

Message from the Director

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Acting Director, National Center for Chronic Disease Prevention and Health Promotion

This issue of *Chronic Disease Notes & Reports*, with a special focus on heart disease and stroke, underscores many of the public health challenges and the important strides we have made in two of the top leading causes of death in the United States. These chronic diseases and their risk factors will not be conquered in doctors' offices, clinics, and hospitals, or through individual lifestyle choices; however, as pointed out in this special issue, chronic diseases and their risk factors *can* be conquered through the health policies and environmental changes we make, effective communication with the public, and renewed emphasis on addressing the social and environmental determinants of health.

In talking to our partners and the people whose health we are working to protect, we have learned that chronic diseases, the aging of the U.S. population, and rising health care costs are all top health priorities. The many successes demonstrated in this issue of *Chronic Disease Notes & Reports* provide a glimpse of the power and promise of prevention in addressing these health concerns.

As the nation's lead agency for the prevention and control of diseases and injuries, CDC is committed to a public health agenda that balances prevention and treatment on one hand, and individual choices and health-promoting policies and environmental change on the other. At the National Center for Chronic Disease Prevention and Health Promotion, we are transforming ourselves through the CDC Futures Initiative to continue to excel as an effective public health center that uses the best available science to help the public live longer, happier, high-quality lives. We look forward to strengthening our collaborations and building new partnerships with the National Center for Birth Defects and Developmental Disabilities and the Office of Genomics and Disease Prevention, who are now our colleagues in the new Coordinating Center for Health Promotion.

Our Center and agency leadership will support nationwide implementation of the *Public Health Action Plan to Prevent*

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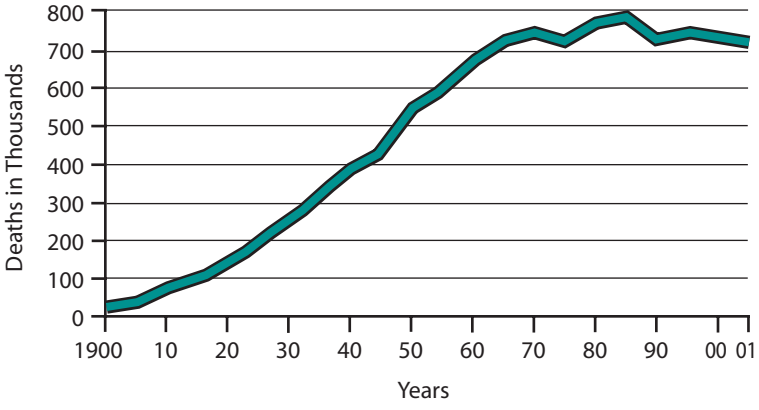
Our Goal for the 21st Century:

Radically Reduce the Burden of Heart Disease and Stroke

In the next century, an important challenge for public health will be to radically reduce the number of deaths from heart disease and stroke. These diseases are the most pressing health burden of our time.

Over the past 100 years, the story of heart disease in the United States has been a sad saga with the appearance of a full-blown and persistent epidemic, as the figure illustrates. We have watched as the number of people dying of heart disease has risen every year, up until the 1960s. Since that time, the number of deaths has remained at or above 700,000 per year.* There has been some good news: age-standardized rates of heart disease deaths have declined sharply over the past 30 years. But those gains, important as they are in signaling the potential for prevention, have been offset, especially by growth of the older population. Thus, they have failed to reduce the burden of heart disease from the level reached back in the 1960s.

Death from Diseases of the Heart, United States, 1900–2001



Source: AHA.*

The story of stroke in America bears an important similarity: although rates of stroke deaths have declined over the past 100 years, the number of people who die of stroke each year is no lower today than it was in 1980.

As discouraging as these numbers are, they have not dampened the public health community's determination to rise to the challenge. Our prevention efforts today will ensure that 100 years from now, the story of heart disease and stroke will be quite different in this country.

Not Just a U.S. Problem

Heart disease and stroke also have global importance, ranking as leading causes of death worldwide in 1990 (World Health Organization). Future projections show that they are expected to remain the world's leading causes of death over the next 20 years, with the numbers of deaths increasing greatly. Calls for action to prevent these conditions are becoming widespread around the globe.

When we look at the projected age composition of the developing world, it becomes clear that we have a brief window of

*American Heart Association. *Heart disease and stroke statistics—2004 update*. Dallas, Tex: American Heart Association, 2003:5.

opportunity—only two decades—in which to avert the full brunt of this epidemic in the critical 35- to 64-year age range of the labor force. Our own forecasts for rising U.S. health care costs attributable to chronic diseases allow no laxity in tackling the challenge of heart disease and stroke prevention to the fullest of our abilities.

This issue of *Chronic Disease Notes & Reports* is devoted to cardiovascular health, with articles about recent developments and works in progress. *A Public Health Action Plan to Prevent Heart Disease and Stroke*, released at the first *Steps to a HealthierUS* Summit in April 2003, provides a framework for such activities. In this issue of the newsletter, you will find many examples that address the action plan's recommendations regarding effective communications and leadership, partnerships, organization, taking action, strengthening capacity, advancing knowledge, and engaging in regional and global partnerships.

We cannot presume that these exemplary activities alone will do the job, but our nation's prospects for preventing heart disease and stroke are improving and gaining momentum. Our recent successes in bringing the key players together and adopting a long-range strategy will take us a good distance toward eliminating health disparities and increasing the quality and years of healthy life that Americans want to enjoy.

We will meet the challenge by preventing cardiovascular disease risk factors from ever developing, detecting and targeting existing risk factors, identifying and treating heart attacks and strokes as early as possible, and reducing people's risk for recurrent heart attacks and strokes. In the process, we will learn much about how to strengthen the effectiveness of strategies to prevent other major chronic diseases, which have much in common with heart disease and stroke as public health challenges.

Message from the Director

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Heart Disease and Stroke. We will develop and implement a coordinated public health action plan on physical activity, nutrition, and healthy weight for all life stages to stop the epidemic of obesity and chronic disease. We will find ways to support the stability and continued success of the Behavioral Risk Factor Surveillance System, an essential public health tool in assessing chronic disease risk factors at the state and local levels. We also remain committed to the *Healthy People 2010* overarching goal of eliminating health disparities.

The challenges we face are enormous, but so are the potential health benefits and the magnitude of the expected health impact. I hope this issue of *Chronic Disease Notes & Reports* reflects the kind of progress and outcomes we can expect if we are firm in our commitment to improve the health and quality of life of all people.

George A. Mensah, MD, FACP, FACC, FESC
Acting Director, National Center for Chronic Disease Prevention and Health Promotion

Heart Disease Burden

America's leading cause of death, cardiovascular disease, disables millions of Americans, costs the nation billions each year—and is on the rise.

Signs of heart disease are appearing even among children. According to a recent study, one in eight children has three or more risk factors for metabolic syndrome, a cluster of symptoms that serves as an early warning signal for heart disease and diabetes.

Americans are more likely to die of heart disease or stroke than any other cause.

Cardiovascular diseases (CVD) are not only the leading cause of death in the United States, they are also disabling, costly, and growing. Ten million Americans are disabled by CVD, which includes heart disease and stroke, as well as other disorders of the circulatory system. Heart disease is the leading cause of premature, permanent disability in the U.S. workforce. Two-thirds of heart attack patients fail to recover fully. Stroke can dramatically diminish the ability of survivors to function independently—with severe effects on both survivors and their families. Twenty percent of stroke survivors require institutional care, and many survivors cannot perform daily tasks. Younger people may often return to work after a heart attack (88% of those under 65), but most stroke victims do not.

CVD may limit a person's ability to work and perform activities of daily living. Patients and their families feel this burden in their daily lives. People with CVD must cope with the cost of treatment, the side effects of medications, the need for increased medical care and access to quality care, and the possibility of disability and dependency. People who have had a heart attack or stroke tend to report fewer healthy days than people who haven't had such an event, according to Kurt J. Greenlund, PhD, a CDC epidemiologist specializing in cardiovascular health.

The financial costs of CVD are enormous. In 2004, these conditions will cost the nation an estimated $368.4 billion in direct and indirect costs.* As the numbers of people who need medication and lifestyle changes increase, so do the related costs. Heart disease is the leading diagnosis for Medicare, for example, costing the program $26 billion annually.

CVD is a growing problem. CDC researchers recently reported that the prevalence of individual CVD risk factors, including high blood pressure, high blood cholesterol, smoking, diabetes, and obesity, is increasing.** Reducing the burden of CVD depends on reducing the prevalence of these risk factors, especially among young people. Death rates are higher among people aged 65 and older—a population that is rapidly increasing.

CVD also contributes to health disparities for some racial and ethnic groups and other disadvantaged populations. African Americans, Hispanics, and American Indians have higher rates of CVD risk factors and mortality than whites. These same groups tend to lack access to health care and health insurance coverage.

*American Heart Association. *Heart disease and stroke statistics—2004 update*. Dallas, Tex: American Heart Association, 2003.

**CDC. Declining prevalence of no known major risk factors for heart disease and stroke among adults—United States, 1991–2001. *MMWR* 2004;53(1):4–7.

As the impact of CVD continues to increase, CDC researchers say that both the public and health care practitioners need to be educated about the importance of prevention. "We know how to prevent CVD," said George A. Mensah, MD, FACP, FACC, FESC, Acting Director of NCCDPHP and former Chief of the CDC's Cardiovascular Health Branch. "We have the tools. Health professionals' awareness of the CVD epidemic is high. But we need to increase our investment in prevention efforts, reach the public with needed information, and improve treatment of CVD by improving adherence to guidelines."

Risk Factors

Risk factors for CVD are also growing. It is projected that 90% of today's middle-aged Americans will develop high blood pressure. Meantime, 70% of those with high blood pressure and 80% of those with high blood cholesterol levels do not have their condition controlled. Signs of heart disease are appearing even among children. According to a recent study, one in eight children has three or more risk factors for metabolic syndrome, a cluster of symptoms that serves as an early warning signal for heart disease and diabetes. More than half of the children studied had at least one risk factor, including high blood pressure, inefficient processing of glucose, elevated insulin levels, low levels of "good" HDL cholesterol, and elevated triglycerides.

Recent studies have convinced researchers that even having the risk factors for CVD is dangerous. "If we are going to take care of this epidemic, we need a broad, comprehensive attack on cholesterol and other risk factors—smoking, hypertension, and obesity," said Sidney C. Smith, Jr., MD, Professor of Medicine and Director of the Center for Cardiovascular Science in Medicine at the University of North Carolina.

"High cholesterol and hypertension (high blood pressure) are especially dangerous risk factors that should be better monitored and followed up more thoroughly," said Dr. Greenlund. Dr. Mensah agreed, saying, "We need to get physicians to refocus on these risk factors and treat patients to target blood pressure and cholesterol levels according to the guidelines."

The findings of a recent study published in the April 8 issue of *The New England Journal of Medicine* support

Know the Warning Signs of a Heart Attack or Stroke

Adapted from the American Heart Association (http://www.americanheart.org/presenter.jhtml?identifier=2876).

The following are signs of heart attack:

- **Chest discomfort.** Most heart attacks involve discomfort in the center of the chest that lasts more than a few minutes or that goes away and comes back. It can feel like uncomfortable pressure, squeezing, fullness, or pain.
- **Discomfort in other areas of the upper body.** Symptoms can include pain or discomfort in one or both arms, the back, neck, jaw, or stomach.
- **Shortness of breath.** This feeling often comes along with chest discomfort, but can occur beforehand.
- **Other signs.** These may include nausea, lightheadedness, or breaking out in a cold sweat.

The following may be signs of a stroke:

- **Sudden numbness or weakness** of the face, arm, or leg, especially on one side of the body.
- **Sudden confusion, trouble speaking, or understanding.**
- **Sudden trouble seeing** in one or both eyes.
- **Sudden trouble walking, dizziness, loss of balance, or coordination.**
- **Sudden, severe headache** with no known cause.

this assertion. Researchers reported that the Pravastatin or Atorvastatin Evaluation and Infection Therapy (PROVE IT) study found that reducing cholesterol and blood pressure in people with heart disease decreased their risk of dying of heart disease, having a nonfatal heart attack, and needing heart bypass surgery or angioplasty. "The study suggests that even people without heart disease can benefit from having cholesterol and blood pressure levels lower than those recommended by the national guidelines then in place—results that prompted changes to the guidelines," according to Dr. Smith. The new guidelines say people at high risk should aim for an LDL ("bad" cholesterol) level of 70 mg/dL. The previous recommendation was 100 mg/dL.

"The new recommendations take into consideration the results of PROVE IT, which demonstrate benefits from a more aggressive lowering of cholesterol," Dr. Smith said. Evidence from other studies will be needed to better inform additional changes to the guidelines.

Dr. Mensah agreed. "Definitely, more people will be prescribed statins as a result of the study," he said. "The lower you can get cholesterol levels, the better off patients are. But most people could reach lower levels by exercising more and adopting a diet rich in fruits and vegetables and low in saturated fats."

Populations at High Risk

Although many people think CVD affects only older adults, about 20% of people who die of heart disease are under the age of 65. Women also need to know that CVD is not just a man's problem. In fact, CVD is a bigger threat to women because they often do not understand their risks or know the warning signs. Over 40% of all female deaths in the United States are due to CVD, according to the American Heart Association.

Once women are over age 45, a higher percentage of them than men have high blood cholesterol. At older ages, women who have heart attacks are twice as likely as men to die within a few weeks. Women typically have heart attacks later in life than men do: the average age of a person having a first heart attack is 65.8 years for men and 70.4 years for women. Stroke is an even greater risk for women. Each year, about 40,000 more women than men

A National Tragedy

Our Nation's Leading Killers: Heart disease and stroke are the first and third leading causes of death for both men and women in the United States. Nearly 2,600 Americans die of cardiovascular disease each day, an average of 1 death every 34 seconds.

Disabling: Ten million Americans are disabled by CVD. Heart disease is a leading cause of premature, permanent disability in the U.S. workforce. Two-thirds of heart attack patients never fully recover, and survivors are 4 to 6 times more likely to have another attack or to die suddenly. Many stroke survivors cannot perform daily tasks, and 20% will require institutional care.

Costly: CVD cost our nation $368 billion in 2004 ($226 billion in health care expenditures; $142 billion in lost productivity). Heart disease is the leading hospital diagnosis for Medicare. CVD hospitalizations cost Medicare $26 billion annually.

Leading Cause of Disparities: One-third of the black/white life expectancy gap is due to CVD. In 2001, age-adjusted death rates for heart disease were 30% higher for African Americans than for whites and stroke death rates were 41% higher.

A Growing Problem That Affects Americans of All Ages: Total deaths from CVD are on the rise, even though death rates have declined. And, tragically, today signs of heart disease are appearing even among children. The risk factors and conditions that cause heart disease are largely preventable.

For more information, visit the following Web sites:
CDC– http://www.cdc.gov/cvh
American Heart Association– http://www.americanheart.org
National Heart, Lung, and Blood Institute– http://www.nhlbi.nih.gov

die of stroke. Although men have higher CVD rates, women have higher numbers of the diseases because more women are in the oldest age groups, making them especially prone to heart attack and stroke.

Comorbidities also contribute to a person's risk for CVD. About one-quarter of people with diabetes die of stroke. Having diabetes doubles the risk for stroke because of the circulatory problems associated with the disease. To make matters worse, diabetes may mask some heart attack symptoms. When doctors instruct patients on how to manage their diabetes, they should also emphasize the importance of preventing CVD risk factors.

Other major factors that influence a person's CVD risk are mental illness and depression, which also can predict the chances of recurrent heart attack. "Depression may also be an outcome of having a stroke," Dr. Greenlund said.

Depressed patients are unlikely to be able to manage self-care routines that can help prevent future heart attacks or stroke. The biological mechanisms of depression also worsen the risk for heart attack. "Abnormal hormone levels and changes in blood biochemistry seen in the setting of depression or psychosocial stress may lead to cardiac arrest," Dr. Mensah explained.

Things That Must Change

In addition to preventing and reducing CVD factors, the public and the health care community must adhere more closely to national guidelines. Dr. Greenlund describes control of blood pressure in the United States as "suboptimal." Only 30% of white patients, 22% of African American patients, and 15% of Hispanic patients have their blood pressure under control. "Patients may find it difficult to make the needed lifestyle changes. Other challenges include not getting the proper medications and staying on the medications once they are prescribed. Patients and practitioners need to be persistent because the drugs may sometimes be hard to adapt to," Dr. Greenlund said, "and finding the right combination of medicines may be difficult for some patients."

Act in Time

Unfortunately, few people recognize the signs and symptoms of heart attack and stroke, even those at higher risk. Timely access to emergency cardiac care and survival depends in part on early recognition of symptoms and immediate action. For example, if given within 3 hours of the start of symptoms, a clot-busting drug can reduce long-term disability for the most common type of stroke. Also, CDC estimates that 400,000–460,000 people die of heart disease in an emergency room or before reaching a hospital every year, accounting for 60% of all cardiac deaths.

Educational campaigns to increase awareness among the general population and targeted messages for persons at high risk and their families may help to improve these statistics. For example, a new campaign by the American Heart Association and the National Heart, Lung, and Blood Institute, called "Act in Time," seeks to increase people's awareness of heart attack and the importance of calling 9-1-1 immediately at the onset of symptoms.

Public Health Action Plan Charts Course for Preventing Heart Disease and Stroke

Concerned public health officials facing a growing national epidemic of heart disease and stroke now have a strategy to counter expected increases in death and disability from cardiovascular illness. *A Public Health Action Plan to Prevent Heart Disease and Stroke*, released in April 2003 alongside HHS Secretary Tommy G. Thompson's *Steps to a HealthierUS* initiative, emphasizes the role of prevention and the need for urgent action to reduce the burden of heart disease and stroke.

Like the national *Steps* initiative, the *Action Plan* recognizes the need to put prevention first, move from a disease care system to a health care system, and educate policy makers about the importance of prevention.

The *Action Plan* charts a course—for CDC, other public health agencies, partners, and the public at large—for achieving national goals to prevent heart disease and stroke over the next two decades.

"The high rates and costs of heart disease and stroke in this country are all too familiar to the organizations and agencies that are working to do something about them," said Darwin Labarthe, MD, MPH, PhD, Associate Director for Cardiovascular Health Policy and Research at CDC. "The *Action Plan* offers specific recommendations and action steps that we can follow to prevent heart disease and stroke, and this guidance comes from a large group of experts from public health practice, academia, other federal agencies, and an array of national and international organizations."

The *Action Plan* embraces three *Healthy People 2010* goals. In addition to the two overarching *Healthy People 2010* goals of increasing quality and years of healthy life and eliminating health disparities, the plan addresses the specific 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. CDC and the National Institutes of Health (NIH)

are the co-lead agencies charged with addressing this third goal.

To achieve these goals, the *Action Plan* calls for a comprehensive public health strategy that includes an array of approaches, such as supporting policy and environmental changes that prevent risk factors, helping people reduce or control their risk factors, and ensuring quality of acute and long-term care for the victims of heart disease and stroke.

The plan's comprehensive strategy is outlined in 22 specific recommendations and more than 60 related action steps needed to implement these recommendations.

Promoting the Plan

The *Action Plan* was developed by three major partners—CDC, American Heart Association/ American Stroke Association (AHA/ASA), and Association of State and Territorial Health Officials (ASTHO). Thirteen additional partners contributed, including two NIH agencies, ASTHO affiliates, and national and international cardiovascular health groups.

Since the *Action Plan*'s release, CDC and its partners have distributed more than 25,000 copies and promoted the plan through presentations at national, regional, and state conferences and meetings. Reactions have been positive from all levels, and requests for copies and presentations continue to come in.

ASTHO, which includes the chief public health official in every state and U.S. territory, will play a vital role in promoting the *Action Plan* throughout the country.

The *Action Plan's* comprehensive public health strategy is to apply the full array of intervention approaches for preventing heart disease and stroke. Five public health areas were established as essential components for carrying out this strategy. These five components are summarized as follows:

- **Taking action.** Translating current knowledge into effective public health action.
- **Strengthening capacity.** Transforming public health agencies by adding new competencies and resources and expanding partnerships to mount and sustain such action.
- **Evaluating impact.** Systematically monitoring and evaluating the health impact of interventions to identify and rapidly disseminate those most effective.
- **Advancing knowledge.** Defining the most critical policy issues and pursuing the needed prevention research to resolve them and expedite policy development.
- **Engaging in regional and global partnerships.** Multiplying resources and capitalizing on shared experience with others throughout the global community who are addressing similar challenges.

"We work on state teams that address chronic disease issues, where we can discuss the challenges and relevance of heart disease and stroke and the need for public health programs and strong, effective interventions," said Kathleen Nolan, MPH, formerly Senior Director of Prevention Policy at ASTHO. "We

also can prepare our members to speak to policy makers at state and national levels in language they will understand."

AHA/ASA also is active in educating policy makers and the public about issues related to heart disease and stroke and how to prevent these conditions—making it an ideal partner for developing and promoting the *Action Plan*.

"Devising a national action plan was an inspired concept," said Rose Marie Robertson, MD, Chief Science Officer and a former AHA President. "AHA was pleased to be involved because we have always used careful strategic planning in our own organization. We also saw the *Action Plan* as a perfect fit with the missions outlined in *Healthy People 2010* and the upcoming *Healthy People 2020*."

Action Plan Provides Guidance for State Prevention Programs

For the *Action Plan* to have the anticipated effect, its message and strategies must take hold at the state level. In fact, this was the main reason for developing the plan. In 1998, Congress funded CDC to help states develop the capacity, commitment, and resources necessary for comprehensive heart disease and stroke programs at the state level.

As expected, this program has continued to grow—from $8.1 million for 8 states the first year to $45.7 million for 32 states and the District of Columbia in fiscal year 2004. The *Action Plan* provides guidance and a long-term vision for activities in this area.

In North Carolina, for example, health officials are using the plan to update their own state plan, which was released in 1999. (See related story, page 12 [State CVH Programs].) State legislators established a heart disease and stroke task force in 1995 to profile the state's disease burden, publicize this burden and its preventability, and develop a comprehensive state plan for prevention.

In 1998, North Carolina was one of only two states to receive comprehensive funding from CDC for a state heart disease and stroke prevention program.

"We're currently updating the original burden document and state plan," said Elizabeth Puckett, PT, Head of the Heart Disease and Stroke Prevention Branch of the North Carolina Department of Health and Human Services. "The framework outlined in the *Action Plan* has really helped us in thinking through how we're going to do this. We're using it to develop a truly comprehensive plan for our state."

North Carolina health officials also have distributed hundreds of copies of the *Action Plan* to partner organizations and legislative leaders at local, state, and regional levels.

National Forum Unites Partners and Promotes Implementation

The *Action Plan* was developed through a process that included key partners, public health experts, and specialists in preventing heart disease and stroke who participated in a working group, one of five expert panels, or a national forum. The national forum will continue to meet

annually to assess progress, identify areas where additional efforts are needed, and maintain the necessary momentum for implementing the plan.

For the *Action Plan* to succeed, CDC and its partners must prioritize the recommended action steps, determine which partners are willing and able to take on which steps, commit to specific time lines, and decide how to evaluate new policies and programs.

During the past year, national forum members were asked to rate each action step on how well it matched their organizations' missions and to indicate which action steps their organizations were capable of addressing.

The working group used this information to establish a list of about 20 priority action steps that could be implemented over the next year. This list was reviewed at the April 2004 2nd National Forum meeting, cosponsored by CDC, AHA/ASA, and ASTHO. About 75 national and international organizations and agencies participated in the meeting.

The outcome of the 2nd National Forum included identification of concrete tasks to be completed before convening the 3rd National Forum in April 2005. For example, in the fundamental area of effective communication, the task is to establish and activate the needed task force to present its strategic plan for communications.

The challenge now is how to implement the *Action Plan* efficiently and cost-effectively. Real change will take time, effort, and resources.

"One concern that we all have is that all of the groups working on this problem are working as hard as they can just to keep up with where we are now," Dr. Robertson said. "All of the resources that we have now in all of our nonprofit, nongovernmental, and governmental organizations are not enough. Progress will not be made unless this is perceived to be a national emergency."

In 2004, heart disease and stroke will cost an estimated $368.4 billion, both in direct health expenditures and lost productivity. Much of this cost could be saved if more resources were devoted to prevention. Although people who suffer heart attacks, strokes, or other debilitating or life-threatening cardiovascular conditions will always need treatment, prevention will save lives, improve quality of life, and save money.

And meeting this challenge to improving the health of our nation will require effort from individuals as well as health officials.

"We know quite a bit about the clinical aspects of heart disease and stroke, but prevention is a lot newer," Ms. Nolan said. "There are less well-known successes on getting populations to change their diet and exercise habits, which is key to preventing heart disease and stroke. This isn't a once-in-a-lifetime or once-a-year behavioral change—like getting people immunized. It's an entire lifestyle change, and that's much more challenging."

For more information or copies of the *Action Plan*, visit http://www.cdc.gov/cvh/Action_Plan.

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State CVH Programs: The Heart of the Matter

Heart disease and stroke are the first and third leading causes of death among men and women of all U.S. racial and ethnic groups. To help reduce the health and economic impact of these diseases, in 1998 the U.S. Congress directed CDC to establish a national, state-based heart disease and stroke prevention program and provided funding for eight states. The program has now grown to support 32 states and the District of Columbia.

According to George A. Mensah, MD, FACP, FACC, FESC, Acting Director of NCCDPHP and former Chief of CDC's Cardiovascular Health Branch, "the goal of the state program is to help states plan, establish, monitor, and sustain population-based interventions. These interventions help to improve the heart health of Americans by addressing rates of heart disease, stroke, and related risk factors such as high blood pressure, high blood cholesterol, tobacco use, physical inactivity, and poor nutrition," he said. "They also help to improve outcomes in the chain of survival by improving emergency response and public knowledge of emergency symptoms. And they help to improve the health of people who are already living with CVD or who have already suffered from a first event."

Establishing a Focus for Change

States funded for heart disease and stroke prevention focus on three types of interventions: educational programs, policy development, and environmental or systems changes. (See box for examples.)

Supporting Activities at Different Levels of Funding

Nancy Watkins, MPH, a CDC Public Health Educator and heart disease and stroke program team leader, points out that the activities of the 33 states funded for heart disease and stroke programs vary according to the funding level. "The majority of the states are funded at the lower capacity-building level, but we are able to provide funding for basic program implementation in some of the states," she said.

Activities in the 22 states funded for capacity building focus on increasing collaboration among public and private organizations concerned with preventing heart disease and stroke, defining the state's CVD burden, assessing current activities, developing and updating a comprehensive state plan, identifying culturally appropriate approaches, and helping state residents become more aware of the signs and symptoms of heart attack and stroke.

The remaining 11 states receive funding for basic implementation. These states expand their activities to enhance all capacity-building program activities; implement and evaluate interventions in health care sites, work sites, schools, and communities; and provide training in heart disease and stroke prevention to public health and health care professionals and partners.

Providing Evaluation Expertise

To help states ensure that their heart disease and stroke prevention programs are most effective, CDC helps states evaluate their programs. "Carefully evaluating interventions and using the evaluation results to make necessary adjustments is a critical part of building a successful heart disease and stroke program," Ms. Watkins said.

"By providing technical assistance and support, CDC helps states expand their evaluation capacity." CDC's contributions include

- An annual evaluation training workshop where experts train state program staff to improve program surveillance, evaluation techniques, and use of evaluation data for program improvement.
- The development of a CVH Management Information System to provide CDC with an improved, real-time ability to collect intervention data and monitor program effectiveness across states.
- Publication of guidance documents, an evaluation framework, a program logic model, and evaluation reports to help states enhance their programs.
- Monthly conference calls to exchange information and share lessons learned between states.

Bringing Key Personnel Together

Two other mechanisms that CDC has developed to help states improve their heart disease and stroke programs are the Cardiovascular Health Collaboration and the Heart Disease and Stroke Practitioners Institute.

States funded by CDC to prevent heart disease and stroke have three areas of focus:

Education

- Conduct campaigns to let people know that having their blood pressure checked regularly is an important first step in reducing their risk of heart disease and stroke.
- Sponsor campaigns to raise public awareness of the signs and symptoms of heart disease and stroke and the urgency of calling 9-1-1 for help.
- Promote education and training programs for health care professionals on systems that support quality health care.
- Increase the public's awareness of the role of lifestyle changes—such as quitting smoking and getting more exercise—in reducing risk for CVD.

Policy

- Promote the development of policies to increase adherence to national guidelines for preventing and controlling high blood pressure.
- Support the development of state-based policies for universal enhanced 9-1-1 coverage.
- Promote policies for treating stroke as an acute emergency.
- Strengthen policies that encourage healthy lifestyles.

Environmental/Systems Changes

- Promote employer-provided insurance that includes coverage for prevention services.
- Collaborate with states to develop systems and intervention programs to detect and control high blood pressure among high-risk groups.
- Promote health care system changes—such as instituting reminder systems for blood pressure checks—to ensure appropriate preventive care for people with high blood pressure, high cholesterol, heart disease, and stroke.
- Promote health care system supports to increase adherence to guidelines for preventing and controlling heart disease and stroke.
- Promote environmental supports, such as blood pressure monitoring, to help people control risk factors and improve their cardiovascular health.

Cardiovascular Health Collaboration

At the National Center for Chronic Disease Prevention and Health Promotion, many different groups work to promote cardiovascular health. In October 2000, the

Cardiovascular Health Collaboration (CVHC) was founded to improve communication and coordinate activities among these groups. According to Darwin Labarthe, MD, MPH, PhD, Acting Director for CVH and Chair of the CVHC, "one of the major accomplishments of the collaboration has been to provide states with a model integrating different elements of chronic disease programs at the state and local level." In collaboration with the Chronic Disease Directors and the Maine Department of Human Services, the CVHC held a 2-day workshop on working across programs in September 2003 in Maine for the New England Region states and New York. "The workshop included examples of key ways in which chronic disease programs are partnering to better address chronic diseases, including heart disease and stroke," Dr. Labarthe said.

Heart Disease and Stroke Prevention Practitioners Institute

In 1999, CDC worked with the American Heart Association (AHA), the Association of State Chronic Disease Directors CVH Council, and the University of Rochester's Department of Community Medicine to conduct a 5-day intensive training program for staff from CVH state programs. The training program focused on developing knowledge and skills in the following areas:

- Health promotion.
- Communication and advocacy.
- Partnership development and maintenance.
- Use of data and assessment for program development.
- Policy and environmental strategies to promote cardiovascular health.
- Program evaluation.

The first institute had participants from 10 to 12 states and the AHA state affiliate partners. According to CDC Health Education Specialist Linda Redman, MPH, MA, CHES, "The institute provided a stimulating environment for states to learn from each other, AHA partners, CDC staff, and an international faculty. In fact, some important long-term relationships evolved out of this institute." In 2003, CDC restructured the annual institute to include representatives from all 50 states as well as the AHA State Health Department representatives from funded states.

The focus of the 2003 institute was on the two core capacities that state program coordinators identified as priorities for training:

- Developing and maintaining successful heart disease and stroke prevention partnerships.
- Implementing strategies for effective policy and environmental changes.

Ms. Redman said that the training included general sessions on the evidence-based foundations of the CVH program, small-group interactive sessions, and concurrent practice/skill-building sessions targeting different levels of skill and experience. "In addition," she said, "all states had the opportunity to share activities and lessons learned in their state."

The next institute will be held in 2005. A training workshop will be offered in August 2004.

Pulling It All Together: Examples from the States

The following four examples illustrate the vital work that CDC-funded states are doing to help reduce the burden of heart disease and stroke in the United States.

Wisconsin

In 2000, heart disease and stroke were the first and third causes of death in Wisconsin, claiming the lives of more than 18,000 of the state's residents each year. As part of its efforts to address the burden of heart disease and stroke in the state, the Wisconsin Cardiovascular Health (CVH) Program joined the Wisconsin Diabetes Collaborative for Quality Improvement Project and expanded the focus of the collaborative to incorporate cardiovascular health issues, including high blood pressure and cholesterol management. The health plans that make up the collaborative have been collecting data on the following five cardiovascular disease-related measures from the Health Plan Employer Data and Information Set (HEDIS) since 2000:

- Blood pressure control.
- Beta-blocker treatment after a heart attack.
- Cholesterol screening after acute cardiovascular events.
- Cholesterol control after acute cardiovascular events.
- Smoking cessation.

In 2001, the collaborative established the Cardiovascular Risk Reduction Project. The project required the establishment of a workgroup made

up of quality improvement managers from the health plans.

According to Mary Jo Brink, MS, RN, Coordinator of the Wisconsin CVH Program, "one goal of the Cardiovascular Risk Reduction Project is to promote standardized practices that follow recommendations in clinical practice guidelines. The project hopes to reach more than 7,000 health care providers, including nurse practitioners and physician assistants, who have a role in preventing heart disease and stroke among Wisconsin residents," she said. "Of the several tools that were developed for this project, the foremost is guidelines for treating adults who are at risk for or have had a cardiac event."

Some of the health care providers practice in Federally Funded Health Centers (FFHCs), which serve poor and uninsured or underinsured Wisconsin residents. The FFHCs are also participating in a cardiovascular and diabetes quality improvement

project that addresses the five HEDIS measures mentioned above and other quality improvement measures. "We expect these projects to affect the quality of preventive care for over 85% of Wisconsin residents who are covered by health insurance and all of those who are members of FFHCs. However, this impact will take several years to realize," Ms. Brink said.

Montana

When it was first funded for capacity building in 2000, the Montana Cardiovascular Health Program developed the 5-year *Montana Cardiovascular Disease Prevention and Control Plan 2000* to prevent and control heart disease and stroke, the leading cause of death in Montana. The plan addresses major cardiovascular risk factors and identifies children, American Indians, and older adults as its priority populations. In 2003, Montana began receiving funding for basic implementation. Some of the milestones that the program has helped to achieve include

- Collaborating with St. James Healthcare and the Montana Chapter of the American College of Cardiology to implement *Guidelines Applied in Practice* (GAP), which were first developed in Michigan. At the first pilot site in Butte, Montana, staff members received training on quality improvement techniques and were encouraged to adapt GAP pathways, standing orders, discharge materials, and patient education examples. According to Crystelle Fogle, Montana Cardiovascular Health Program Manager, "a greater percentage of patients at the pilot site are now counseled on quitting smoking, have their LDL cholesterol tested within 24 hours of admission, are discharged from the hospital on lipid-lowering medication, and receive dietary counseling." GAP is now being replicated at other hospitals in Montana.
- Organizing a statewide Cardiovascular Health Summit for health professionals that focuses on ways to prevent and treat CVD and promote cardiovascular health. "This annual conference, which will be held for the third year this April, is unique in Montana because it emphasizes cardiovascular disease prevention and treatment with a public health perspective," Ms. Fogle said.
- Using an adapted version of New York's "Heart Check" survey to conduct a work site survey of Montana businesses, tribal health organizations, Indian Health Service units, and colleges and universities. According to Ms. Fogle, "the CVH Program will use the survey results to recruit work sites for a wellness intervention and to identify gaps in work sites' CVH policies." As a first step toward implementing these projects, Montana established a Governor's Council on Worklife Wellness in January.

North Carolina

The North Carolina Cardiovascular Health Program focuses on reducing the burden of heart disease and

stroke by creating heart-healthy work sites, health care systems, schools, and communities. The program collaborates with statewide partners through the Justus-Warren Heart Disease and Stroke Prevention Task Force, which was established by the General Assembly in 1995 to increase awareness of signs and symptoms of heart attack and stroke, improve control of high blood pressure and cholesterol, and improve the quality of care for people with cardiovascular disease.

Because North Carolina already had a Task Force in place and a plan for addressing the burden of heart disease and stroke under development, it was one of only two states awarded funding for basic implementation in 1998, the first year of the CDC program. According to Libby Puckett, Head of the North Carolina Heart Disease and Stroke Prevention Branch in the Division of Public Health, "receiving CDC funding made it possible to fully implement the statewide plan." Important elements of the plan that are now in place include the following:

Reaching people throughout the state. To reach those at greatest risk for cardiovascular disease, the program has established six county-level programs designed to build regional partnerships, help develop local goals and objectives, and serve as a resource for local efforts to reduce heart disease and stroke. Two additional county-level programs focus on reducing the disproportionate burden in death rates and risk factors among African Americans.

Providing coverage for proven prevention measures. The program collaborates on the BASIC Preventive Benefits Initiative with the North Carolina Prevention Partners, which includes a variety of health plans and employers. The initiative is working to ensure that benefits to prevent CVD are voluntarily purchased by employers, voluntarily covered by insurers, and offered by providers and health systems. As a result of these efforts, the number of health plans that offer tobacco cessation, nutrition, and physical activity insurance products to employer groups increased by 75%.

Promoting partnerships to prevent stroke. The program coordinates the activities of the Tri-State Stroke Network, which is made up of public health and medical professionals, policy makers, and advocates from North Carolina, Georgia, and South Carolina. The network facilitates collaborative efforts to improve stroke awareness and advocacy, prevention and treatment of stroke, and data collection and surveillance.

Mississippi

Funded since 1999, the Mississippi Cardiovascular Health Program has achieved the following milestones in preventing and controlling heart disease and stroke, the leading causes of death and disability in Mississippi:

- Developed a state plan in conjunction with the legislatively mandated Task Force on Heart Disease and Stroke Prevention and Control. According to Tennille Howard, Mississippi CVH Program Coordinator,

"the overarching target areas are preventing and managing risk factors." The plan integrates relevant sections of the State Tobacco Prevention and Control Plan and the Mississippi State Plan for Diabetes Prevention and Control with other sections on priorities such as hypertension, cholesterol, quality patient care management, and public awareness of signs and symptoms of heart attack and stroke.

- Expanded the social marketing campaign Know Your Numbers to increase public awareness of important risk factors—body mass index (BMI), cholesterol, glucose, and blood pressure—for heart disease and stroke in partnership with Subway® restaurants, the Mississippi Chronic Illness Coalition, and Mississippi State University Extension Service staff.
- Held a luncheon for state legislators to inform them of the Know Your Numbers campaign and the importance of prevention in reducing health care costs and improving quality of life statewide. The Mississippi Chronic Illness Coalition conducted this activity in conjunction with the annual Capitol Day event with strong support from the American Heart Association (AHA) Southeast Affiliate and the Mississippi State Department of Health Office of Health Promotion. Ms. Howard said that more than 200 legislators and staff were screened and educated on BMI, cholesterol, glucose, and blood pressure during Capitol Day.
- Worked with Mississippi State University Extension Service staff to provide a 3-day training course for the Mississippi Chronic Illness Coalition members and other program partners on coalition building, strategic planning, reaching consensus, and conducting evaluations. "Participants were engaged in practical workgroup learning sessions that can be used with community groups and other coalitions," Ms. Howard said.
- Developed the *2004 Mississippi State of the Heart and Stroke Report,* which contains the latest available data from BRFSS and vital statistics. The report will provide information on the health disparities both within the state and between Mississippi and the nation. Additionally, the report will include county-level data on deaths related to heart disease and stroke in all 82 Mississippi counties.
- Participated in the Delta States Stroke Consortium (DSSC), whose purpose is to develop plans to reduce the high rates of stroke in Mississippi, Alabama, Arkansas, Louisiana, and Tennessee. The Mississippi Chronic Disease Director chaired the committee on risk factor prevention and control and was a member of the DSSC Steering Committee.

Cardiovascular Disease Emerges as a Growing Global Threat

Cardiovascular disease knows no national boundaries.

Worldwide, cardiovascular diseases (predominantly ischemic heart disease and stroke) are the leading causes of death, accounting for the deaths of an estimated 17 million people in 2001. That figure is expected to increase to 25 million by 2025, unless significant prevention efforts can halt this rise. The World Health Organization (WHO) calls cardiovascular disease (CVD) one of three "neglected global epidemics."

And, surprisingly, the burden of CVD is falling disproportionately on poorer countries. Twice as many deaths from CVD occur in developing as in developed countries, according to the WHO *2003 World Health Report*. In some developing countries, ischemic heart disease and stroke are the first and second leading causes of death.

This trend seems to contradict conventional wisdom, which has viewed CVD as the "Western disease," the domain of industrialized nations where smoking, overeating, and underexercising are common, whereas the priorities for poorer countries have been health problems like malnutrition, inadequate sanitation, and communicable diseases. However, experts recently have recognized the arrival of a group of chronic diseases, including CVD, "on top of the persistent threat of communicable disease," the WHO report noted. This dual burden strains the resources of developing countries that now face multiple health challenges.

"We have seen a shift from predominance of infectious diseases to an even greater burden of cardiovascular disease over time," said Darwin Labarthe, MD, MPH, PhD, Associate Director of Cardiovascular Health Policy and Research at CDC and the lead developer of CDC's *Public Health Action Plan to Prevent Heart Disease and Stroke*. "Globally, the familiar risk factors are increasing and that trend—compounded by increasing life expectancy—is fueling the swing toward more CVD."

Increasing urbanization and industrialization bring lifestyle changes that promote CVD. For example, tobacco use is increasing sharply in many low- and middle-income countries. Obesity, high cholesterol levels, and diabetes are also on the rise globally.

Responding to these global concerns, CDC's *Action Plan* addresses various approaches to reduce global CVD. Two of its summary recommendations propose to

- 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.
- Work with regional and global partners to develop prevention

The World Health Organization calls cardiovascular disease one of three "neglected global epidemics."

policies, formulate strategies for use of global media for health communications, and assess the impact of globalization on cardiovascular health.

Dr. Labarthe said these recommendations reflect CDC's commitment to taking advantage of two kinds of opportunities. "We have the potential to help reduce the global effects of coronary disease and stroke, and we also have a great deal to learn from our colleagues in this field."

Partners Join Forces for Prevention

Partners met in April 2004 to discuss specific ways to implement specific steps outlined in the *Action Plan* (see sidebar). "It is important to prioritize the most important and effective steps," said Dr. Labarthe. The meeting included key partners.

Another venue for international discussion of CVD was the 5th International Heart Health Conference in Milan, Italy, on June 13–16, 2004. This was the latest in a series of international conferences that have been held in different sites around the world to focus on the broad social and economic aspects of cardiovascular disease. Each conference concludes with a declaration, which is a "call to action" to suggest what each sector and country can do to prevent CVD. The Milan conference addressed the role of technology and its potential benefit in the efforts to control global heart disease. (For more information about the conference, entitled "Positioning Technology to Serve Global Heart Health," visit the Web site at http://www.g8cardio.org/5IHH.)

The Multiple Costs of CVD

The primary sponsor of the conference is the International Heart Health Society, headed by David R. MacLean, MD, Professor and Director of the Institute of Health Research and Education at Simon Fraser University in Vancouver, British Columbia, Canada. Dr. MacLean, who has written and consulted broadly on the topic of global CVD, underlined the costs, both personal and economic, of the worldwide disease increase.

"The economic impact of CVD is huge, especially because it affects so many people in the prime of their working lives," Dr. MacLean said. More than a third of CVD deaths occur in middle-aged adults. Disability and premature death due to CVD disrupt the lives of individuals and their families, as well as reduce a country's potential productivity, according to the World Health Organization.

Moreover, clinical care of CVD is costly. "Chronic diseases such as CVD are the end stage of a process, and they are very expensive to treat by the time you reach that point," Dr. MacLean noted. This is especially true for developing countries that must divert limited resources for secondary treatment. "Low- and middle-income countries are grappling with this 'double burden' of disease—trying to respond to chronic diseases at the same time that they are struggling with communicable diseases like tuberculosis, HIV/AIDS, and malaria," he said.

"But there is much we can do to treat people 'upstream' from these problems," Dr. MacLean said. He and

many other international health experts advocate establishing strong primary care systems in developing countries. "That's a great investment to help improve the health of whole populations, not just the high-risk segments," he said. A good solid primary care system addresses communicable diseases as well.

Numerous international organizations are working to raise awareness about this and other strategies to reduce the impact of CVD. Such approaches include promoting awareness of CVD, reducing tobacco consumption, identifying and managing diabetes, and modifying behaviors related to diet and physical activity. For example, WHO is developing a Global Strategy on Diet, Physical Activity, and Health.

Training is a key element in all global CVD prevention efforts. CDC's Dr. Labarthe is co-director of a 10-day training seminar on CVD epidemiology and prevention sponsored by the World Heart Federation, which annually trains 30–35 fellows, typically representing some 25 countries. Dr. Labarthe said that training is badly needed on several levels. "In addition to the epidemiology seminars, it's important to develop training for health professionals at the community level in low- to middle-income countries."

Just as CVD is a disease linked to multiple risk factors, the key to its prevention is also multifactorial. A broad public health approach will encompass varied aspects and involve many sectors, both national and international. Fortunately, evidence about the major risk factors linked to CVD is abundant, and strategies for reducing those risk factors are well accepted. As a recent World Bank publication stated, "Prevention or treatment of risk factors for CVD is effective and sustainable in the long run. The risk of CVD can be reduced quickly and substantially with successful preventive practices…[that also have] a favorable impact on other noncommunicable diseases that share the same risk factors."

For more information about CDC's international work in CVD prevention and links to other international organizations, visit the Web site: http://www.cdc.gov/cvh/library/international_resources.htm.

Global CVD Challenge: Mobilizing for Action

CDC's Public *Health Action Plan to Prevent Heart Disease and Stroke* proposes the following action steps to reduce CVD globally:

- Develop and effectively support a global mission and vision of the United States for cardiovascular health by inventorying existing and potential partners for global cardiovascular health (CVH) collaboration and evaluating current CVH research and training programs of these potential partners.
- Establish a partnership for global heart disease and stroke that develops, monitors, and evaluates global CVH strategy, including eliminating inequalities in CVH in the United States and globally, and assessing the impact of globalization and trade policies (e.g., related to tobacco, food and agriculture, and pharmaceuticals) on national and international trends in CVD.
- Develop a global communications strategy, including identifying models of collaboration to help improve media content and coverage on the need for global CVD prevention and communicating to health professionals the importance of promoting CVH.
- Strengthen global capacity by tailoring programs to (1) assist and support decision makers in developing national strategies, (2) develop methodology and tools to analyze the impact of policy implications, and (3) analyze the social and economic costs of heart disease and stroke and the benefits of preventing them.
- Strengthen global monitoring and evaluation.
- Promote and support global research.

Health Department and Businesses Team Up to Fight Heart Disease and Stroke

Businesses that spend wisely to promote the cardiovascular health of their employees will reap huge returns on their investments. This is a vital message that health departments need to be conveying to businesses, according to Pamela Southers Wilson, RD, LD, Cardiovascular Health Director, Georgia Department of Human Resources, Division of Public Health.

Partnering with employers is a key strategy of the state's new Cardiovascular Health Initiative. Ms. Wilson meets with chamber of commerce directors, human resources staff, and others across the state to share information on how businesses can strengthen their wellness programs and target the health problems that are most costly—cardiovascular disease, high blood pressure, high cholesterol, obesity, and diabetes.

Businesses that have focused on people at high risk for cardiovascular disease (CVD) have trimmed hundreds of thousands of dollars from their health care costs each year (see employer profiles, beginning on page 28). Their employees are healthier, happier, and more productive on the job. And best of all, many of these employers are extending their efforts to reach not only employees, but also their families and the surrounding community.

Businesses Are Seeking Information

"Now is an ideal time for health departments to reach out to businesses and other partners in the community," said Ms. Wilson. Health care costs are soaring, and CEOs are looking for unbiased, scientific guidance on the best practices for reducing employees' risk for heart disease and stroke.

"My role is to engage the communities so that they can see their potential for partnering with others to provide health care focused on prevention," Ms. Wilson explained. In each community, important partners include

- Hospitals, because they realize that wellness is good for their

bottom line and for community outreach.

- Chambers of commerce, because they have a vested interest in any business strategies that contribute to a vital, healthy economy.
- City and county governments, because they employ many people.
- Physicians who are willing to work with high-risk patients to help them make lifestyle and behavior changes that will reduce their risk for heart disease and stroke.
- Insurance companies, which must be willing to negotiate the plans they offer businesses.
- The fitness community, for example, the Parks and Recreation Department or the local YMCA, which can partner with local businesses to ensure that employees have access to a place where they can exercise safely.
- The local health department, which can provide communities with training, expertise, and unbiased public health information to guide wellness programs.

"Our state health department's role is to be a consultant," said Ms. Wilson. "We offer training to hospitals and others wanting to provide work site wellness programs. We direct work sites to lifestyle interventions. We let them know that if the employee costs are to be reduced, the unhealthy behaviors have to change."

"When we go to a chamber of commerce to tell them about the successful wellness programs at other work sites, their eyes light up," Ms. Wilson noted. "They say, 'We have hospitals that are eager and ready to do this. How can we work together?' We're finding that this is truly a grassroots movement."

Advice for Health Departments

State health departments should do their homework before approaching businesses. Ms. Wilson offers these tips:

- **Speak in business terms.** During meetings and workshops with businesspeople, "talk to them in language they can understand—in business language, not in public health terms," noted Ms. Wilson. Talk about the economic incentives for promoting the cardiovascular health of employees. Link wellness to the company's bottom line.
- **Share success stories.** Success stories are an effective way to convey the nuts and bolts of a wellness program, and health departments can share these stories with businesses in an unbiased way. The Georgia Department of Human Resources uses a slide presentation that describes businesses with successful wellness programs and details the companies' cost savings and returns on investment.
- **Provide advice that is based on sound evidence.** "The public health agency's role is to provide research-based information for the community," Ms. Wilson advised. "For example, when consulting with work sites, we promote the DASH (Dietary Approaches to Stop Hypertension) eating plan as opposed to some of the more popular fad

diets now on the market, because the DASH diet is clinically proven to reduce high blood pressure," she explained. "We also recommend that work sites do fasting lipid tests," which are proven to provide more accurate test results than nonfasting tests. In addition, the state health department urges employers to get their health information from credible sources such as the American Heart Association and American Cancer Society rather than any source whose motivation is to make money or who may have a hidden agenda.

- **Assess each work site's unique needs.** When meeting with employers, the Georgia Department of Human Resources asks each participant to complete an assessment sheet describing their work site so that the health department staff can identify the greatest health risks and barriers facing employees. "We then give them a demographic report on their work site and suggest where they might be able to focus their prevention efforts," Ms. Wilson said. To see how employers are progressing, the state health department follows up with the work sites through a contract arrangement with Health Navigators, LLC, where contractors are experienced in health promotion, health benefits, and preventive medicine.

Everybody Wins

"Targeting cardiovascular disease at work sites will help not only companies but also the employees, their families, and society," advised Peter A. Townsley of Health Navigators, LLC. "This is a breakthrough for health departments because they can work with businesses toward common goals," he said. "It's a breakthrough for businesses because people have been selling them a variety of work site wellness services, and very few of them have been evidence-based."

"Businesses that do this correctly get their investment back at several levels," he said. "First, they identify people with the greatest need and target their health problems before they become more costly. For example, switching to a healthy diet today can avert later use of costly prescription medications, angioplasty, or bypass surgery."

"A second benefit is that the overall health of the company's employee population improves," Mr. Townsley explained. People at risk for heart disease and stroke are greater users of the health care system than others. But when they change their lifestyles and adopt healthier behaviors, they are no longer in this high-risk group. Thus, the company's health care costs decline.

Some companies take the money they save and invest it back into their wellness programs to target other chronic diseases. "If employees are no longer obese, their blood pressure is under control, and they're not having heart attacks or needing bypass surgery, the company is saving money, enough to do screening in other areas—for example, cancer screening," Ms. Wilson said.

"Health care costs are skyrocketing for businesses, and the focus has been on cost management, not prevention," noted Charles H. Taylor, MD, of Health Navigators, LLC. That is because few companies are aware that prevention can be extremely cost-effective.

"Employers have no public health perspective, but when they hear from health departments, 'This is how it works. Here are standards based on credible scientific evidence,' they listen," added William R. "Robbie" Burlas, Consultant, Health Navigators, LLC.

"Public health partnerships with businesses are the best start to a healthier society. Everybody wins—the state health department, the community, the employer, and the employees," said Dr. Taylor. "And if our public health messages get to employees and they take them home to their families and communities, it's a chance to change the world," Mr. Townsley added.

Editor's Note: Georgia's Cardiovascular Health Initiative was showcased in June at the 5th International Heart Health Conference in Milan, Italy, where cardiovascular health officials from around the world gathered to network and share information.

What Do Successful Work Site Programs Have in Common?

Businesses with successful wellness programs share several common qualities. These are elements shared by companies large and small, in both rural and metropolitan areas.

- **Target cardiovascular disease and other chronic diseases that pose the greatest health risk to employees and are most costly to the business.** The most successful programs "take their health promotion dollars and spend them on high-risk populations—employees who are overweight or who have high blood pressure, high cholesterol levels, or diabetes," explained Pamela Southers Wilson, RD, LD, Cardiovascular Health Director, Georgia Department of Human Resources, Division of Public Health.
- **Offer employees regular health screenings and risk assessments as part of the company's benefits plan.** The wellness staffers use the clinical findings from these tests to stratify employees into different health risk categories. "Employees in the high-risk category can then be directed to interventions that will lower their risk factors," such as high cholesterol, Ms. Wilson said.
- **Follow evidence-based standards.** "Companies that have the most successful wellness programs follow medical standards that have been researched and proven effective in promoting health or preventing disease," explained Ms. Wilson.
- **Integrate health promotion and health benefits into the company's core business plan.** This integration will ensure that

"And if our public health messages get to employees and they take them home to their families and communities, it's a chance to change the world."

health promotion is a high priority among managers and will link health promotion and health benefits with the company's overall goals and mission. The health benefits plan is a substantial cost to the business and must be a part of the company's overall plan for success. "General Motors currently spends more on health benefits than steel," Ms. Wilson noted. This means health benefits must be scrutinized in the same way other business decisions are made.

- **Win the long-term support of company leaders.** "You've got to have management's support because you might not see a return on your investment for several years," advised Denise Ivester, Group Insurance Manager, Fieldale Farms, a large poultry company based in Baldwin, Georgia. Managers were willing to wait 6–8 years to show a return on investment, even though it took Fieldale Farms only half that time. "We're committed to our wellness program, and my managers have given me every resource I need to offer this program," she said.
- **Remove the barriers that make it difficult for employees to lead a healthy lifestyle.** King and Prince Seafood in Brunswick, Georgia, is a good example. The company has 464 employees who pack seafood and ship it to commercial enterprises. In the early 1990s, the company assessed its needs and discovered why employees were not getting regular medical care for their high blood pressure. Employees said they could not afford to take off from work to visit the doctor, because that would mean lost wages. They also said they were embarrassed to leave work and go directly to a doctor's office because they smelled like fish.

  These findings prompted the company to open a clinic on-site. "Employees are now much more likely to get the preventive care they need, not only for high blood pressure but also for other much-needed services, such as prenatal care," said Ms. Wilson. "King and Prince is saving enough money that every year, during November and December, employees do not pay their health plan benefits. That's a bonus to the employees."
- **Encourage employees to participate.** "Some companies offer extra benefits to employees who are willing to be screened and participate in risk-reduction programs," Ms. Wilson suggested. Or they require employees to be screened and to participate in follow-up programs if they are identified as being in the high-risk category; otherwise, they cannot subscribe to the health benefits plan.

  "When offering gifts as incentives, companies must make sure the gifts are culturally appropriate and items that employees really want," Ms. Wilson advised. For example, a service or high-tech industry might offer vacations or gift certificates for dinner as incentives. At Fieldale Farms,

employees receive a $10 gift certificate to a local discount store when they participate in the cardiac profile screening. The company has a drawing for a $300 gift certificate for department supervisors whose employees' participation in the screenings is high. "For those who are at high risk and participate in the dietitian sessions or the fitness programs, periodically throughout the year we give incentives such as jump ropes, T-shirts, measuring cups and spoons, cookbooks, Crock-Pots, and grills," Ms. Ivester noted. "We put our company logo on all the incentives."

To further encourage participation, Fieldale Farms allows employees to leave the production lines for screening without clocking out. In addition, employees are paid for time spent visiting the company nurse and dietitian for follow-up sessions.

- **Create a healthy environment.** Companies with successful wellness programs do more than just offer assessments and services. "Health and wellness must be part of the culture," emphasized Laura Hanson, Manager, Learning and Development, Highsmith Inc., Fort Atkinson, Wisconsin. "Wellness must be more than just a stand-alone program. Companies need to provide a culture and environment that supports healthy lifestyle choices," she said.

  Highsmith works with a local vendor to provide healthier snacks in the company's vending machines. "We subsidize the cost of healthier items and add that cost to the less healthy snacks," Ms. Hanson explained. "For example, pretzels cost 25 cents, but potato chips cost 75 cents. This is one example of small, inexpensive changes an organization can make to impact the overall health and well-being of its employees."

- **Develop partnerships with local health departments, hospitals, fitness centers, and physicians willing to work with patients on lifestyle interventions.** For example, Summit HealthCare System in Newnan, Georgia, has a full-service YMCA on-site. "Summit's wellness program refers cardiac and any patients needing rehabilitation to the on-site Y," Ms. Wilson explained. "Hospital staff, their families, and people in the community can all go to this Y. It's a seamless attempt to bring doctors to the work site and to bring the community and hospital together."

  At Fieldale Farms, employees who need to reduce their risk for heart disease and stroke are offered free memberships to a local gym, but there is a catch. Employees must go to the gym at least six times a month for Fieldale Farms to pay.

These are just some of the successful strategies that businesses are using to promote the cardiovascular health of employees. For additional approaches, see the profiles of four work site wellness programs, beginning on page 28.

Duke University

Durham, North Carolina

Studies have documented how LIVE FOR LIFE has boosted employee health and morale while cutting absenteeism, workers' compensation costs, and health care expenses at Duke.

The health of the individual is inseparable from the overall health of the corporation—that is the premise of Duke University's LIVE FOR LIFE health promotion program, now entering its 16th year. "Cardiovascular disease is a major focus of the program because it has a huge impact on employee well-being, productivity, and health care costs," explained Julie Joyner, Manager of the LIVE FOR LIFE program.

Studies have documented how LIVE FOR LIFE has boosted employee health and morale while cutting absenteeism, workers' compensation costs, and health care expenses at Duke. Particularly impressive have been the findings about Duke's Pathways to Change program, a component of LIVE FOR LIFE that uses telephone, mail, and in-person coaching sessions to help employees control their high cholesterol or high blood pressure.

"Before their first day on the job, employees learn if they would benefit from entering the Pathways to Change program," explained Ms. Joyner. "We offer health risk assessments as part of our pre-placement screening so that we can identify right away if a new employee is at risk for cardiovascular disease," she said. "These employees learn about the many resources available to help them enhance their health."

Over a 1-year period, the employees attend 12 coaching sessions with a registered nurse or registered dietitian. They also receive educational materials and professional blood pressure or cholesterol screenings. The Pathways to Change program is tailored to each employee, depending on his or her readiness to change.

After completing the 1-year program, participants are assessed again to see how their blood cholesterol and blood pressure levels have changed. In a recent evaluation of the program, the results were striking:

- Of the 194 employees who entered the Pathways to Change program with high cholesterol levels in July 2000, 85% cut their risk and 54% became risk-free by June 2001. Duke estimated the program saved nearly $125,000, with a return on investment ratio of 3.29.*
- Of the 185 employees who entered the program with high blood pressure in July 2000, 89% cut their risk and 60% became risk-free by June 2000. Duke estimated it saved nearly $40,000 as a result, with a return on investment ratio of 1.21.*

Ms. Joyner encourages other employers to offer cardiovascular health promotion programs and offers the following advice:

Assess the company's needs to see what opportunities exist for avoiding costs. "Look for the low-hanging fruit—things that are easy

*Return on investment = program savings divided by program costs. The Pathways to Change cholesterol control program saved $124,800 and cost only $37,830 to offer. The blood pressure control program saved $39,536 and cost $32,375 to offer. These figures do not take into account, however, the costs for Duke's larger comprehensive health promotion program, which provides a supportive culture for the Pathways to Change program.

and will give you the biggest return on your investment," she suggested. For example, the Pathways to Change program helps employees avoid heart attacks and strokes by screening for high cholesterol and then offering assistance to those at risk. The company has saved far more on health care costs than it has had to spend to offer this life-saving service.

Develop an integrated strategy. "Part of the reason that LIVE FOR LIFE is so successful is that it is integrated with our human resources department," Ms. Joyner noted. The human resources staff members are involved with health promotion, as are Duke's claims administrators and the network of area physicians who provide care to employees.

Give employees a variety of opportunities to maintain healthy lifestyles. Duke University has many different ways for its 20,000+ employees to participate in health promotion activities—by telephone, online, in personal consultations, or as part of a traditional class. Duke also organizes special events such as the "Lose More in 2004" weight management program. This 12-week program, which focuses on diet, exercise, and behavior modifications, has attracted more than 700 participants this year alone. In addition, Duke's new Run/Walk Club attracted over 200 employees the first night. Club members have plenty of options, ranging from taking a 5K walk to running a half marathon.

Encourage employees to take an active role in their health. "We try to make it easy and remove the barriers for employees," Ms. Joyner said, "but they've got to be in charge."

Have fun. From April through September, Duke invites the local farmers' markets to sell fresh produce and healthy lunches on campus. "Our employees are so overloaded, and for many of them, it's hard to plan and prepare nutritious meals, given all they have to do in the workplace," she said. "So we provide a festive atmosphere with music and plenty of fresh fruits and vegetables."

If the employees won't come to you . . . "Our strength is that we go out to people to conduct health screenings, assessments, and other services," Ms. Joyner said. "We have a van to transport our nurses to the multiple different locations that make up the Duke University Health System."

Evaluate your program. Evaluations will allow you to identify weaknesses and strengths and keep your health promotion program on track. Even though LIVE FOR LIFE is a nationally recognized model program that has won both state and national awards, "we still have our struggles," Ms. Joyner commented.

Highsmith Inc.

Fort Atkinson, Wisconsin

Highsmith Inc. is proof that a small business can make a big difference in the cardiovascular health and well-being of its employees. Highsmith, a national distributor of school and library supplies and furnishings, is located in a small community west of Milwaukee. The company has 225 employees, three-fourths of them women.

Employees can make use of the company's on-site walking trail and walking programs, free blood pressure screenings, exercise classes, weight management programs, healthy cooking classes, and healthy choices in vending machines. Highsmith also offers a monetary incentive approach for health insurance, which encourages employees to get recommended health screenings, participate in the company-wide health screening, and not use tobacco products.

"We provide employees and their families with the tools and resources they need to build a better relationship with their health care provider and assist them in making more informed decisions about their health and well-being," said Laura Hanson, Manager of Learning and Development at Highsmith. "Approximately 80% of our employees are on the health insurance plan. Of that 80%, 83% receive the monetary incentive. We also have a low tobacco-using population."

The annual health screening, held during the first week of May, is open to all employees and their spouses. "It takes employees and their spouses about 1 hour and 15 minutes to be screened, and it's all done on company time and free of charge," Ms. Hanson said.

The health screening takes place over the course of a week, starting at 5:45 A.M. each day and continuing into the evening. The early morning screenings are popular for people who are undergoing fasting cholesterol tests. "We want to accommodate employees on different shifts and their spouses," she noted. The screenings begin with a measurement of height and weight, followed by CO_2 and blood pressure readings, a full lipid panel, cholesterol and glucose test, and sub-maximum walking tests on a treadmill (to determine aerobic capacity).

"In 2003, Highsmith began using the Framingham Risk Score," she said, "because we wanted to focus on cardiovascular disease and help our employees and their spouses better understand their risk for getting heart disease within the next 10 years." New for 2004 is a coronary risk profile that focuses on heart disease and stroke as well as diabetes, nutrition, and exercise.

After the participants complete the initial tests, they visit three feedback stations:

- They meet one-on-one with a health educator from Highsmith's health insurance provider to discuss the health screening results and Coronary Risk Profile. Health topics they cover include physical activity, nutrition, stress, social health, alcohol, drug and tobacco use, safety, self-care, and readiness to change. Health information and other resources are available to assist participants in making healthy lifestyle choices and enhancing their overall health.
- Next, the participants meet one-on-one with a counselor from Highsmith's employee assistance program to discuss their emotional well-being. Participants also have an opportunity to talk about topics such as depression, parenting, stress, sleep disturbances, eating disorders, chemical

dependency, gambling addiction, relationships, obsessive-compulsive disorders, and life balance.

- Last, employees meet with Ms. Hanson to learn more about the health resources and services available at Highsmith. This confidential session gives participants the chance to talk more in-depth about health topics of concern. If needed, additional one-on-one sessions may be scheduled.

When conducting the annual health screening, Highsmith and its partners make every effort to create a relaxed setting for employees. "We have banners and refreshments, and participants can register for a reduced-rate healthy cooking magazine subscription or cookbook. Overall, the environment and culture we've created at Highsmith make it comfortable for employees and their families." (See related article, page 36.)

How Can a Small Company Do This?

Just because a company is small does not mean that it cannot offer highly effective wellness services with a limited budget. "We're a smaller company, small enough so that it doesn't make sense for us to have an on-site exercise facility," Ms. Hanson noted. "But we do have a break-room area where we are able to hold exercise classes before and after first-shift hours. We offer step aerobics, body sculpting, and yoga. Employees pay $5 per semester to attend."

Another low-cost wellness tool for small businesses is an intranet. "We have a company intranet site that is a great tool to provide information and educate employees," she said. "There is a section titled E-health, which is designed to link employees to reliable health information. Topics range from blood pressure, cholesterol, and weight management to depression, relationships, and menopause. We screen this information and make sure it's credible before it goes on our site."

In addition, Highsmith sponsors wellness challenges, which help employees set and reach their fitness and nutritional goals. The winners of these challenges receive prizes, which do not have to be expensive.

Developing Human Capital, Seeing Return on Investment

Highsmith's many efforts to safeguard its employees from heart disease and stroke are just part of a company initiative known as TAG, which stands for

- **T**otal commitment to developing human potential.
- **A**ccess to learning opportunities.
- **G**rowth as an individual and as a company.

This initiative reflects the company's expanded view of wellness, which encompasses many different aspects of a person's life. For example, TAG encourages employees to make healthy lifestyle choices and assists them in taking a more assertive and educated role in their own care. The initiative also helps employees maintain their emotional health, enrich their work and personal lives and balance the two, and develop their jobs and careers.

Just because a company is small does not mean that it cannot offer highly effective wellness services with a limited budget.

"It is important for employees to have the tools, knowledge, and resources to do their jobs," Ms. Hanson stated. "It's also important to recognize that if they're struggling with high blood pressure or going through a divorce, it affects their productivity." TAG's goal is to help employees learn, grow, and develop. Their growth, in turn, helps them support the company goals.

"As a result of TAG, Highsmith has seen a return on its investment," Ms. Hanson reported. The company uses three benchmarks to measure return on investment:

- **Health insurance costs.** Just 13 years ago, the company saw health insurance costs soar 53%. These costs have stabilized in recent years, increasing 2.9% in 2002, and 3.1% in 2003—far less than at most other companies.
- **Turnover rate and average length of service.** The turnover rate is low, at 7%–9%. The average length of service is now 12 years. It had been 14 years, but the company recently offered early retirement, and that affected the length of service.
- **Workers' compensation costs**. These costs have declined in recent years. "We've integrated stretching sessions within our warehouses and office, and this, in addition to other safety efforts, has made a significant impact on our workers' compensation claims," Ms. Hanson explained. The stretching is done on company time, and the program is geared toward each employee's specific tasks.

"The TAG is a strategic initiative, and the desired outcome is to have the human capital necessary to meet our company goals and objectives," noted Ms. Hanson.

Fieldale Farms

Baldwin, Georgia

Barriers that block access to good health care are a major problem for people new to this country, especially those with difficulty speaking English. In northeast Georgia, a poultry company is helping immigrant employees overcome these barriers and boost their cardiovascular health.

With 3,600 hourly workers and 600 salaried employees, Fieldale Farms is the largest employer in Habersham County, Georgia. About 80% of the employees are Hispanic, and a small number are Vietnamese or Laotian.

Insurance coverage is mandatory for all employees (the company pays half of the costs), and coverage is effective their first day on the job, according to Denise Ivester, the company's Group Insurance Manager. The insurance plan covers preventive care, with a strong focus on preventing heart disease and stroke.

Cardiovascular health is also a major focus of the wellness program, which Fieldale Farms started 11 years ago. After meeting with the insurance carrier to review past claims, "we learned that cardiovascular disease was the most costly disease in our workforce, even though our workforce is so young, with most employees less than 40 years old," Ms. Ivester said.

Cardiac Profile Is Comprehensive

The wellness program is offered to all Fieldale Farms employees and spouses who are covered by the company's health plan; about 60% of employees participate. To limit downtime, the company has on-site mobile units that bring the health screenings directly to employees. The company pays 100% of the cost for a variety of tests, including cancer screenings and a comprehensive cardiac profile.

All employees are eligible to undergo the cardiac profile, which includes tests for total cholesterol, high-density lipoproteins, low-density lipoproteins, triglycerides, and glucose. The wellness coordinator reviews each employee's laboratory values, risk factors, and other circumstances to determine how great his or her risk is for having a heart attack or stroke. Employees are placed in one of three categories:

- **Category I.** These employees have normal laboratory values and fewer than three risk factors. They are offered no further wellness benefits.
- **Category II.** These employees have abnormal laboratory values and fewer than three risk factors or normal laboratory values and three or more risk factors. They are eligible to receive membership at a local fitness center plus nutrition counseling classes by the company's full-time registered nurse and a dietitian, who work as a team on site visits.
- **Category III.** These employees are at high risk for having a heart attack or stroke within the next 5 years. They have abnormal laboratory values plus three or more risk factors, are currently experiencing chest pains, or have had a heart attack or stroke in the past. These employees are eligible for a stress test/electrocardiogram, nutrition counseling, and (if the stress test is negative) cardiac rehabilitation.

"We're not going to add wellness benefits, such as nutritional counseling, fitness memberships, stress tests, or mini-physicals, until their cholesterol levels are at or above 240—these are the people with really severely high cholesterol," Ms. Ivester explained. "Say an employee is in Category III, and it looks as if he will have a cardiac event in the next 5 years. We'll send him to a physician for a mini-exam. We'll get the cardiologist to okay a stress test for that employee. We pay for all of those benefits."

Looking Beyond the Bottom Line

These wellness interventions have more than paid for themselves, according to Ms. Ivester. "We spend less than $200,000 a year on wellness," she said, "and wellness makes up about 2¼% of our total health plan costs." The investment in wellness has helped to reduce the company's health plan costs over the past decade. The annual cost per active employee has held steady, ranging from $2,462 in 1994 to $2,716 in 2003. In comparison, other employers in the South have seen their health plan costs steadily rise, from about $3,600 in 1994 to $5,281 in 2003.

"The return on investment is very good," Ms. Ivester said, "and we have

"We don't try to change their way of eating. We've found that their chances of being successful are much better if we use the foods they're accustomed to eating."

less absenteeism. Employee loyalty comes into play because people feel good about coming to work for us." But the benefits go far beyond the company's bottom line, she added. "Fieldale Farms is a place where you can come and not speak the language, learn a trade, make very good pay, and get excellent benefits," noted Ms. Ivester.

"Our employees are out there on that production line working very hard," Ms. Ivester asserted. "We try to help these folks to stay healthy. And it's not just the dollar savings. We want to have healthy employees and to make a difference. Our hearts are in it. I have a wonderful team here. It's not just a job to us. If we have someone here who's not controlling their blood pressure, it's a real concern."

Treating employees with respect and safeguarding their privacy is crucial to a wellness program's success, she emphasized. And because so many employees at Fieldale Farms do not speak English, overcoming the language barriers was essential. Whether Fieldale Farms is conducting voluntary cholesterol screenings or offering health counseling sessions to employees, "we talk to them in their language," Ms. Ivester said. "We have translators. We advertise to them in their languages what services are available. And we do nutrition counseling in their languages."

But other cultural differences, besides language, must be considered. "We've even purchased food pyramids and cookbooks that feature American, Asian, and Hispanic foods," Ms. Ivester noted. "We don't try to change their way of eating. We've found that their chances of being successful are much better if we use the foods they're accustomed to eating."

She urges other companies to consider offering wellness benefits to employees. If enough companies were onboard in the nation's battle against obesity, high cholesterol, high blood pressure, and diabetes, "how different it could be for our children," she said. The obesity and diabetes epidemics are frightening, she added. "We all have issues we can work on personally, but there's going to have to be a bigger change. Work site wellness is something that works long term. This is good for the health of individuals and the company, and it's good for the health of this country. These things are going to make a difference. They could turn the tide for this country."

L.L.Bean

Freeport, Maine

The Healthy Bean wellness program helps the employees of L.L.Bean make behavior and lifestyle changes that reduce their risk for heart disease and stroke. The program's focus on healthy lifestyles stems from company founder Leon Leonwood Bean. "He lived to be in his 90s and enjoyed hunting, fishing, and spending time in the outdoors his entire life," recalled Susan Tufts, Manager of the Wellness Program. "It would have been hard to do that without leading a healthy lifestyle."

L.L. Bean's grandson, Leon Gorman, launched the employee wellness program in 1982 because he felt it was the right thing to do. "But the program never would have lasted all these years if it had not been a good business decision as well," said Ms. Tufts. L.L.Bean employs about 4,000 regular employees and as many as 6,000 seasonal workers each year.

Heart disease is the number one health risk for employees, and it contributes significantly to L.L.Bean's health care costs. "We are a self-insured company, so our health care costs are directly related to what the employees spend," she explained. To help control these costs, L.L.Bean promotes the cardiovascular health of its employees in many ways: by offering health risk assessments, helping with smoking cessation, offering exercise incentives, helping with weight management, and providing team activities that focus on healthy lifestyles.

Health Assessments Are Comprehensive

Each health risk assessment takes 90 minutes to complete, and it is done on company time. Employees are paid $40 in cash to undergo the assessment, which includes tests to check blood pressure, cholesterol levels, and body composition. "In the past, we targeted risks by department (for instance, people in shipping might be more likely to smoke), but now we do a comprehensive health risk assessment, looking at each employee's risk factors for cardiovascular disease as well as mental health," Ms. Tufts said.

At the end of the assessment, employees get immediate feedback about their health status and are told what services are available to help them improve their health. Employees with a high risk for cardiovascular disease are referred to a counselor, and they can earn up to $200 if they make healthy changes in their lives.

"Some people tell us they had never had their cholesterol measured, so these assessments are a great awareness tool," according to Ms. Tufts. "It's important for people to not only know their blood pressure and cholesterol levels but to know what they mean. It's important that they understand the difference between a healthy and an unhealthy weight."

"Companies must look at the total person—and what is going on in their lives—if these interventions are to work," Ms. Tufts emphasized. "If a person is suffering from anxiety, depression, or stress, they're not necessarily going to be successful in addressing their cardiovascular disease risks until those problems are addressed," she explained.

The health risk assessment also carefully measures each employee's readiness to change. "Someone who is eager and ready to stop smoking could benefit far more from a smoking cessation program than a person who is only contemplating such a change," Ms. Tufts pointed out.

"We have focused on all of the risk factors for cardiovascular disease since the program began," said Ms. Tufts, "and these efforts are paying off. Our smoking rate was about 24% in 1985," she said. "Today, we

"…anything you can do to prevent cardiovascular disease will benefit the company's bottom line. Small employers are now trying this because health care costs can make or break the company."

have dropped that rate down to 12.9 —that's close to a 45% reduction. With about 500 fewer employees who smoke, we estimate that we save about $750,000 a year in health care costs."

Work with Community Partners

L.L.Bean has developed partnerships that have strengthened its Healthy Bean wellness program. For example, the local Visiting Nurses Association sends nurses to conduct cholesterol screening and diabetes education workshops at the company.

The company also considers the state of Maine a key partner. When the governor of Maine launched the Healthy Maine Partnerships Initiative, L.L.Bean launched its own Healthy Bean Initiative, which aims to change the company's environment and culture in healthy ways. "One way we've changed the environment is by subsidizing the fruit and salad bar at work, cutting the price by 25%," said Ms. Tufts. "At the same time, we slightly increased the price of less healthy foods. Since we did that, we've seen a 50% increase in the use of the fruit and salad bar and almost a 50% decline in french fry sales."

"Promoting healthy lifestyles at work makes good business sense," Ms. Tufts advised, "whether your business is large or small. When you look at preventing cardiovascular disease, everything is related to lifestyle factors," she said, "and anything you can do to prevent cardiovascular disease will benefit the company's bottom line. Small employers are now trying this because health care costs can make or break the company."

Her advice to other companies is, "Get strong leadership support for your wellness program. Make sure employees at all levels of your company are involved and have access to these services. And always, always maintain respect for the individual and recognize that behavior change is difficult."

How Can We Entice Employers to Invest in Work Site Health Promotion?

Health departments and governments can use many tactics to win corporate America's support in the battle against heart disease and stroke, according to Ron Z. Goetzel, PhD, Director of the Institute for Health and Productivity Studies at Cornell University and Vice President of Consulting and Applied Research at Medstat in Washington, D.C.

Health departments can recognize and reward area employers that are doing an exemplary job of promoting the health of employees. "Reward and publicly recognize them for their accomplishments in health promotion," he said. "Invite the press to attend the award ceremony."

"This tactic not only honors and compliments those exemplary

employers; it also spotlights a state or community's best practices in work site health promotion," he noted. "If you share what works in health promotion with the employer community, other companies in that community can learn from best practices and apply methods with a proven track record."

Work site health promotion efforts can also have benefits on a national scale. Dr. Goetzel cited a March 15, 2004, *Washington Post* article describing health improvement efforts in Poland as contrasted with almost no effort to improve population health in Russia. "Poland put a lot of effort into prevention by promoting good nutrition, exercise, and smoking cessation," he said, "and their life expectancy and quality of life has improved. However, Russia placed no emphasis on health promotion. Their life expectancy and quality of life has deteriorated, and this has also affected the productivity of workers."

Bridging the Gap Between Government and Business

Dr. Goetzel has worked with many businesses, governments, managed care organizations, and other clients to bridge the gap between academia, the business community, and the health care policy world. He has developed eight recommendations, summarized below, that governments can follow to entice more employers to offer effective health promotion programs:

1. **Provide tax incentives to companies that offer credible and effective health promotion and disease prevention programs to their employees.** These incentives can take the form of tax credits or rebates that partially reimburse companies (up to a certain limit) for the expense of developing and operating credible and effective health promotion and disease prevention programs. To receive these tax incentives, companies would need to provide documentation that their programs meet specific quality and effectiveness criteria established by an independent national credentialing organization. Governments can also educate employers about the types of incentives that encourage employees to participate in health promotion programs—for example, discounts, credits, or rebates on medical plan premiums. Incentives should be structured so that they promote participation in programs rather than changes in biometric measures, such as weight loss.
2. **Communicate with employers and educate them about the benefits of health promotion and disease prevention.** Governments can educate employers about the organizational stressors that may increase risk factors. Once educated, employers will become more motivated to seek and provide opportunities for health improvement and risk reduction. Governments also should educate the public health community about efficient processes that business leaders use to diagnose problems, review options, make

decisions, and carry out actions. It would benefit government officials (especially those in public health) and business leaders to begin a meaningful dialogue focused on health issues facing American businesses and how federal agencies can help businesses make informed decisions regarding health care. For example, business leaders might ask for help in deciding which treatments for any given condition are most cost-effective or seek advice about the safety of certain medical treatments. Or they might offer to share insights on how they have improved the quality of health promotion programs or corrected problems within their companies. Open communication between business leaders and government leaders might be one of the best ways to more directly involve companies in improving the health of employees and communities.

3. **Honor and reward America's healthiest companies.** For the past 10 years, the C. Everett Koop National Health Award has been presented to American companies that have documented improved employee health and cost savings resulting from their work site health promotion and disease prevention programs. This annual prize should be elevated in prestige and stature by having the President of the United States confer the award to winning companies at a highly publicized award ceremony.

4. **Establish a blue ribbon panel to study the impact of health promotion and disease prevention on America's competitiveness in the global economic community.** The President can also make health promotion and disease prevention a national priority by establishing such a panel. This would highlight the importance of health promotion and disease prevention programs and their relationship to self-care and personal responsibility initiatives directed at individual and family health. Elevating the discussion to the level of national debate and commentary will draw more attention to the importance that health promotion and disease prevention plays in improving the health of the nation.

5. **Invest in better research performed in corporate settings.** Most studies to evaluate health promotion programs have been private-sector initiatives funded by private sources. Consequently, even though the research is growing in both volume and rigor, it is still relatively primitive when compared with large-scale government-funded studies. Government agencies should establish special research funds that are earmarked for studying the science underlying work site health promotion and disease prevention programs as well as the effectiveness of these programs in improving health, lowering costs, and increasing worker productivity. Researchers in charge of evaluations should be encouraged to

use the most rigorous statistical methods available to study these programs so that conclusions are based on strong scientific evidence rather than conjecture, anecdote, or belief.

6. **When evaluating health promotion and disease prevention programs, use accepted analytic methods that focus on safety, effectiveness, and cost-effectiveness.** Growing evidence suggests that corporate health promotion and disease prevention programs are not only cost-effective but also cost-beneficial. But proving that a program is cost-beneficial is far more difficult than proving it is cost-effective. These programs should be judged by using the same criteria of efficacy that are applied to other health interventions—namely safety, effectiveness, and cost-effectiveness. If health promotion and disease prevention programs are placed side by side with more traditional medical treatment programs, using accepted cost-effectiveness analytic methods, their economic value and justification should become evident. Rather than trying to prove these programs always save money, companies might find it sufficient to prove that they demonstrate a better use of money.

7. **Provide talking points to corporate executives so they can advocate health promotion and disease prevention programs and convey how important these programs are to the success of American business.** Governments need to educate company leaders about the advantages of providing health promotion and disease prevention programs to employees. Federal agencies can sponsor focused seminars and business roundtable meetings, and leadership forums can be sponsored by federal agencies. Equipped with knowledge and appropriate talking points, corporate leaders can become enthusiastic and visible spokespersons for health promotion and disease prevention initiatives within their own organizations and to other businesses. They can rally support from nonprofit organizations, the media, and various industry groups, all of whom can exert enormous influence to change public perceptions of the importance of these programs.

8. **Influence the development and measurement of corporate health promotion and disease prevention programs.** Government agencies should take a more active role in helping employers who want to develop, manage, and evaluate health promotion and disease prevention programs. Government officials can fund large-scale studies that evaluate various aspects of these programs and publicize their results more broadly. For example, studies could focus on the use of tax or other financial incentives that encourage more businesses to develop health promotion and disease prevention programs.

"Most Americans spend a huge portion of their life at work, making work site health initiatives a powerful vehicle for reaching millions of people with vital public health messages."

Government agencies also can act as models for effective health promotion and disease prevention programs by improving the quality of programs offered to civilian and armed forces employees and by developing and promoting best-practice programs to be emulated by employers in the private sector. In addition, government officials should closely examine the relationship between statutory safety program requirements, such as those mandated by the Occupational Safety and Health Administration, and their possible links to health promotion and disease prevention initiatives. Government agencies should provide seed money to employers who want to examine the effectiveness of health promotion and disease prevention in preventing work-related injuries and illness. New government initiatives in health promotion and disease prevention should include experts in the health promotion industry as much as possible.

Dr. Goetzel is optimistic that in the future, more government and business leaders will work together to tackle major health threats such as heart disease, stroke, and obesity. "Most Americans spend a huge portion of their life at work," he said, "making work site health initiatives a powerful vehicle for reaching millions of people with vital public health messages."

REACH 2010 Projects Reflect Community Concerns

Think nationally—act locally. That's the foundation of CDC's Racial and Ethnic Approaches to Community Health (REACH) 2010 program.

National surveys highlight the persistent disparities in health status among America's racial and ethnic groups. Cardiovascular disease (CVD) is one of several key health indicators that are disproportionately high in certain groups. For example, CVD—the leading cause of death among African American men and women—accounts for about a third of the differences in life expectancy between African Americans and whites. Other racial and ethnic groups also have disproportionately higher rates of heart disease and stroke. For example, in 2001, the proportion of premature deaths (deaths occurring among people younger than 65) from heart disease was higher among American Indians/Alaska Natives and African Americans than among whites, according to a recent CDC survey. (See "Racial and Ethnic Gaps" for more basic statistics.)

But despite disheartening recent national trends, every community offers a different profile of CVD concerns. And the community holds the key to identifying its unique problems and to forging solutions. To encourage such local action, CDC has funded 43 groups around the country to form coalitions and develop

Racial and Ethnic Gaps in Cardiovascular Health Persist

- Heart disease is the leading cause of death for African American men and women.
- African Americans develop high blood pressure earlier in life than whites, and their blood pressures are much higher than those of whites—among the highest in the world.
- African Americans are far more likely than whites to die of stroke. In 2000, the stroke death rates per 100,000 population were 87 for black men, 78 for black women, 59 for white men, and 58 for white women.
- Cardiovascular disease (heart disease and stroke) account for the largest portion of the difference in life expectancy between African Americans and whites.
- Premature heart disease deaths (those occurring among people younger than 65) are highest among certain racial and ethnic groups: African Americans, American Indians/Alaska Natives, Asians/Pacific Islanders, and Hispanics.
- American Indians bear a greater burden of health risk factors and chronic disease than other racial and ethnic populations. They have the highest prevalence of three of the risk factors related to cardiovascular disease—obesity, current smoking, diabetes—of all racial and ethnic groups.

interventions that are appropriate for their communities. The goal is to demonstrate innovative prevention approaches to reducing health disparities among targeted groups in their area.

REACH 2010 aims to reduce disparities among the following racial and ethnic groups: African Americans, Alaska Natives, Native Americans, Asian Americans, Hispanic Americans, and Pacific Islanders. The six priority health areas are infant mortality, breast and cervical cancer screening and management, cardiovascular disease, diabetes, HIV/AIDS, and child and adult immunization. Nine REACH projects pinpoint CVD reduction as their priority community concern, and 13 projects include both CVD and diabetes in their focus.

Putting Communities in the Driver's Seat

"All public health is local," said Wayne Giles, MD, MPH, Associate Director for Science in the Division of Adult and Community Health (DACH) at CDC's National Center for Chronic Disease Prevention and Health Promotion. "People in the local communities are in the best position to identify their key health problems and shape solutions. When community coalitions are in the driver's seat, they are effective at putting CVD on the radar screen and mobilizing forces to bring positive changes."

"Getting accurate local data about CVD is essential," added Dr. Giles. Information from CDC's stroke and heart disease atlases help communities assess their specific burden of disease so they can decide where to focus prevention efforts.

The REACH 2010 project in Mecklenburg County, North Carolina, used data on CVD and diabetes to concentrate on a specific cluster of 14 Charlotte neighborhoods that include about 20,000 people. The project emphasizes a systems and community change approach.

"We try to look beyond how to bring about individual behavior change and ask what are the barriers and systems issues," said Marcus Plescia, MD, MPH, Director of Chronic Disease and Injury at North Carolina's Division of Public Health, and principal investigator for the project. "Our approach involves people in these neighborhoods—they are the ones best qualified to know what the system barriers are and to think about how best to make changes."

In fact, lay health advisors from the targeted neighborhoods are an essential component of the project. Natural leaders in the community are recruited to provide information and referral to community resources, with the goal of reducing disparities in CVD and diabetes. The lay health advisors receive intensive training in the basics of CVD prevention, as well as other areas important to bringing about change in the community: counseling techniques, community organization, and stages of change and other health behavior models.

"Our idea was to train these lay health advisors not just to provide medical information about risk factors, but to be agents of change," said Dr. Plescia. "The people we selected have the trust of their community—they are the ones to whom others turn for help. They are just average folks who have time to give and want to help improve health in their community. They really understand their neighbors' lifestyles and problems."

For example, the lay health advisors dug deeper to find out why people in the community didn't eat many fruits and vegetables, a cornerstone of heart-healthy nutrition. They found that a lack of affordable, fresh produce in neighborhood grocery stores was a big barrier. So, the REACH 2010 community coalition teamed with the health department's Fighting Back program, a grassroots program with a long history in the neighborhoods, to open a neighborhood farmers' market. Every weekend in season (April–October), farmers sell fresh produce at reasonable prices at a health department campus in the heart of the neighborhood. "The health department played a role in helping organize the neighborhood farmers' market," said Dr. Plescia, "but the community pointed the way."

Community Organizations "Pick 6" Healthy Habits

In Kansas City, various community sectors contribute in areas where they have specific strengths. The Kansas City Chronic Disease Coalition (KC-CDC) operates as part of the Missouri Primary Care Association to implement the REACH 2010 project, focusing on prevention of diabetes and CVD among African American and Hispanic residents who live in 11 neighborhoods in the city.

"We Practice Healthy Habits" is the community initiative designed to help people live longer by reducing the risk of chronic disease through promoting healthy eating and an active lifestyle.

The project's "Pick 6" campaign invites community groups to choose six out of an array of suggested "healthy habits" activities that will

promote improved cardiovascular health in their communities. Organizations in each sector are asked to concentrate on what they do best, explained John Cyprus, project manager. "This is a value-added approach," he explained. "We empower people to go further by encouraging each organization to extend or enhance what it already does to promote healthy habits." For example, faith groups have promoted exercise and sponsored cooking classes to demonstrate healthier ways to prepare traditional recipes. Some cultural organizations have recruited barbershops and beauty salons to promote healthy habits.

"Collaboration between sectors results in even more effective strategies," Mr. Cyprus said. A university extension service designed healthier versions of ethnic recipes—for example, showing ways to reduce the "bad fats" that are typical of some traditional Hispanic dishes—and the REACH project worked with a publicist to get the extension specialist to demonstrate cooking on a local television station. That proved such a success that the project decided to fund a regular "health tips" segment on the station. "That gave us far better exposure and a more credible presence than if we'd paid to advertise our project," Mr. Cyprus said.

The KC-CDC project also partnered with the Health and Human Services Region VII to bring the Red Dress Exhibit, part of a national *Heart Truth* campaign to raise awareness about women and heart disease, to Kansas City. Prominent fashion designers contributed red dresses to the national exhibit to highlight the message that "heart disease doesn't care what you wear"—that all women should know about the risk factors for CVD and ways to help prevent it. Kansas City-based Hallmark Cards and the Missouri Department of Health and Senior Services helped sponsor a series of events to tie in with the exhibit, including 30-minute, self-guided health walks and T-shirts featuring pictures of the red dresses.

To extend reach of the *Heart Truth* campaign as an ongoing component of KC-CDC's Healthy Habits campaign, a community volunteer created a quilt incorporating multiple T-shirts featuring the red dresses. The original quilt will travel to different sites throughout Kansas City's urban core as one means to highlight the issue of women and heart disease. A duplicate quilt will be displayed at the Second National CDC Prevention Conference on Heart Disease and Stroke in Atlanta in August 2004.

Over the years, many different approaches have fallen short in bringing about significant reductions in racial and ethnic disparities in cardiovascular health. The REACH 2010 program aims to change that picture. "REACH is unique because it gives communities resources and lets them determine the approaches that work best for them," said Pattie Tucker, RN, DrPH, Senior Health Scientist with DACH's community health and program services branch. "We think these projects will be successful because they establish trusting relationships in the communities they serve."

WISEWOMAN Program Aims to Reduce the Risk of Heart Disease for Underserved Women

Community projects are innovative, comprehensive—and successful.

WISEWOMAN ensures access to quality education and skill-building opportunities for all women and promotes support groups to help women maintain healthy behaviors.

Heart disease is a major health problem for women. Disadvantaged women are particularly vulnerable to obesity, high blood pressure, and high cholesterol—key risk factors for heart disease and stroke. CDC's WISEWOMAN (**W**ell-**I**ntegrated **S**creening and **E**valuation for **W**omen **A**cross the **N**ation) program has been successful in reaching this population with innovative projects operated at the community level.

The mission of the WISEWOMAN program is to provide low-income, under- or uninsured 40- to 64-year-old women with the knowledge, skills, and opportunities to improve diet, physical activity, and other lifestyle behaviors to prevent, delay, and control cardiovascular disease and other chronic diseases. It reaches the intended population, offers a comprehensive approach to behavioral change (including education, counseling, and culturally appropriate activities), and provides new knowledge on health disparities.

Evidence shows that WISEWOMAN is successful in responding to the needs of underserved women. During the past 3 years, WISEWOMAN has uncovered many conditions for the first time, including 2,700 cases of previously undiagnosed hypertension, 3,000 cases of high cholesterol, and 400 cases of diabetes. The women with these conditions would have been unaware of their risk factors if not for WISEWOMAN.

Community partnerships help strengthen WISEWOMAN projects. By pooling resources and sharing lessons learned, WISEWOMAN projects and their partners offer underserved women an array of health services they otherwise would not receive. In addition to offering screening, WISEWOMAN ensures access to quality education and skill-building opportunities for all women and promotes support groups to help women maintain healthy behaviors.

A recent issue of the *Journal of Women's Health* (Vol. 13, No. 5) featuring the program describes the ways in which it makes a difference in women's health. The journal issue includes articles on how to develop model programs, train staff members, and increase cultural competence. It also highlights program achievements such as the following:

- A Michigan WISEWOMAN project collaborates with the League of Women Voters and a local sporting goods store to provide discounted walking shoes to program participants.
- Twelve months after a Massachusetts project offered blood pressure screenings, the prevalence of high blood pressure dropped by 7%–9% among the

underserved women who were screened.

- In Arizona, WISEWOMAN screenings resulted in an average decrease of 6–11 mg/dL in total cholesterol after 12 months.

The WISEWOMAN program is administered through CDC's Division of Nutrition and Physical Activity. To prevent cardiovascular disease, the program screens low-income, underinsured and uninsured women aged 40–64 years for chronic disease risk factors and provides lifestyle intervention and referral services. CDC funds 15 WISEWOMAN projects, which operate on the local level in states and tribal organizations. Projects provide standard preventive services including blood pressure and cholesterol testing, and help women develop a healthier diet, increase physical activity, and quit using tobacco.

Cardiovascular Health Tool Kit Will Help States Collaborate with Businesses

State health departments will soon have a tool kit to use when partnering with businesses to promote cardiovascular health. CDC and the Prospect Center of the American Institutes for Research are working together to develop the tool kit, which will identify promising practices in the workplace and offer tips to help businesses select health plans for preventing and controlling high blood pressure, high cholesterol, heart disease, and stroke.

The tool kit will be pilot tested, evaluated, and distributed to state heart disease and stroke prevention programs in August 2004. States will receive training on how to effectively use the tool kit. Each kit will include components such as these:

- Data on the burden of heart disease and stroke on employers.
- A guide to help employers estimate their cost savings by investing in services to prevent heart disease and stroke (for example, work site health risk assessments and weight management counseling).
- A compilation of promising practices and effective evidence-based interventions in work site and health care settings.
- A checklist to help employers select a heart-healthy benefits package that fits their business needs as well as the health needs of employees.
- Marketing materials and a PowerPoint presentation that health departments can use when educating company officials about the economic benefits of preventing heart disease and stroke.

For more information about the tool kit, contact Dyann Matson Koffman, DrPH, Centers for Disease Control and Prevention, Mail Stop K–47, 4770 Buford Highway, NE, Atlanta, Georgia 30341-3717.

Registries Play an Important Role in Helping Understand and Prevent Cardiovascular Disease

CDC and its partners are actively developing data systems designed to improve the quality of cardiovascular care and survival. These systems, called disease registries, provide data used to improve care of patients who have strokes, high blood pressure, and heart attacks. Registries often play an important role in helping researchers understand the burden of cardiovascular disease and identify related health disparities and prevention strategies.

"The registry activities are part of our efforts to improve the public health surveillance in heart disease and stroke," said Zhi-Jie Zheng, MD, PhD, a CDC senior epidemiologist. "Our vision is to establish an integrated national surveillance system that will track and measure the population burden of cardiovascular diseases and quality of cardiovascular care."

The Paul Coverdell National Acute Stroke Registry

Stroke is the country's third leading cause of death and a major cause of serious, long-term disability. The burden of disease is substantially higher among African Americans than among whites; in 2000, the stroke death rate was 87 per 100,000 for black men and 79 per 100,000 for black women, compared with 59 per 100,000 for white men and 58 per 100,000 for white women. Approximately 50% of stroke sufferers die before they reach a hospital.

Additionally, an estimated 4.5 million Americans and their families live with the disabling effects of stroke. Researchers have found that certain drugs—called thrombolytic medications or "clot busters"—can improve stroke outcomes in eligible patients, yet only about 3% of patients with stroke are being appropriately treated with these medications. In addition, far too few stroke patients arrive at the hospital in time to receive treatment that could lead to full recovery, and far too many become needlessly disabled.

To help overcome these deficiencies, CDC established The Paul Coverdell National Acute Stroke Registry. This registry, initiated in 2001 and still in the developmental phase, has as its primary goal to help hospitals improve their delivery of the critical emergency care that can prevent permanent disabilities from stroke.

CDC first convened an expert panel to make recommendations about the specific kinds of quality improvement data that should be collected for the registry. This panel included representatives from Brain Attack Coalition, National Stroke Association, American Heart Association/American Stroke Association, National Institute for Neurologic Disorders and Stroke, and Centers for Medicare and Medicaid Services.

The first CDC funding went to four sites in Georgia, Ohio, Michigan, and Massachusetts for the design and

testing of prototypes to measure the delivery of acute stroke care to patients in their states. In 2002, an additional four sites in California, Illinois, North Carolina, and Oregon were funded for the same purposes. By late 2002, these eight sites had yielded data from 7,333 patients at 109 hospitals. On the basis of these findings, the registry, in collaboration with state health departments and hospitals, developed plans that focused on quality improvements in emergency room diagnosis, in-patient management, and secondary stroke prevention (helping patients control high blood pressure and cholesterol levels and stop smoking).

The long-term goal of this important project is to establish state registries nationwide and a clearinghouse to provide information and educational materials on stroke to health care professionals and the public. Data from the registries will be instrumental in helping states reduce death and disability from stroke and improve the quality of life for stroke survivors.

The program's namesake, Paul Coverdell, was a U.S. Senator from Georgia who died after a stroke in July 2000 at the age of 61. For additional information on the registry, visit http://www.cdc.gov/programs/chronic5.htm.

Cardiovascular Surveillance via a Hypertension Registry

The Wake Forest University School of Medicine is conducting a 3-year pilot project to establish an emergency department–based hypertension (high blood pressure) registry at

the Wake Forest University Baptist Medical Center. In collaboration with a CDC technical advisor, investigators at the medical center developed an active database that tracks information on the emergency care of hypertensive patients, referrals and recommendations for follow-up, and follow-up care.

After preliminary data have been analyzed and interpreted, findings from the registry will help in the design and targeting of programs for improving the state and local infrastructure of medical care for high blood pressure. The project's primary goals are to

- Assess the impact of high blood pressure prevalence, clinical presentation, and frequency of events in the emergency department and the population it serves.
- Identify the tools and limitations that could either facilitate or handicap the development and implementation of a comparable

"Our work with CDC has not only made it possible for us to conduct this important research, but also to disseminate critical information to the community."

system in all hospital emergency departments in the state.

Of the approximately 67,000 annual emergency room visits at this medical center, almost half (45%) are made by African Americans and members of other minority groups. All adult patients seen in the emergency department have blood pressure readings taken, and their records are screened for inclusion in the registry. Patients who have sustained blood pressure values above 140/90 mmHg, a history of hypertension, or who are currently taking antihypertensive medication are included. Already, policies and quality of care for these emergency department patients have been improved by some of the registry's preliminary findings.

CDC and its partners at the Wake Forest University School of Medicine hope to find that within 3 years from the time this demonstration project started (1) the number of emergency room visits for symptoms related to cardiovascular or cerebrovascular problems (those assigned related ICD-9 codes) will drop by 5%; (2) the number of people who come to the emergency room with no history of high blood pressure or current usage of hypertension medication, yet are shown to have elevated blood pressure, will decline by 10%; and (3) the number of people who are found to have high blood pressure, regardless of history or diagnoses, will drop 10% overall.

For more information about the Hypertension Registry, contact Carma Ayala, PhD, MPH, at CDC by e-mail at cayala@cdc.gov.

A Community-Based Cardiac Arrest Registry Project: The Study of Sudden Unexplained Death in Multnomah County, Oregon

An estimated 400,000 people die annually of sudden cardiac death (SCD), a major clinical and public health problem. For about 5% to 15% of all SCD cases, a definitive cause cannot be determined. In collaboration with CDC, the Heart Rhythm Research Laboratory at the School of Medicine, Oregon Health & Science University, is conducting a prospective study using a novel, comprehensive approach to uncover "hidden" causes of sudden and previously unexplained cardiac deaths in the community. The study's principal investigator, Sumeet Chugh, MD, said that although the phenomenon of sudden cardiac death has been studied for many years, it has only infrequently been done in a systematic manner in communities where it actually happens.

According to Dr. Chugh, this is much more than just a registry. The project's ultimate goal is to discover risk factors and novel methods for preventing such deaths, which could be very significant if you consider that, nationally, only about 5% of people experiencing sudden cardiac arrest survive long enough to get to a hospital. Many of these deaths (25% to 40%) occur without warning among people under the age of 65. Therefore, finding ways to identify persons at high risk is extremely important.

This project has three elements. First, researchers sought to understand the magnitude of the problem in the community. They identified all cardiac arrest deaths in Multnomah County (population 660,486) through emergency medical services, the medical examiner, and 16 area hospitals, then ascertained which of those cases met their criteria for sudden death. Using a retrospective review of death certificates, they also identified cases of cardiac deaths that had occurred outside of hospitals. Findings from this research have yielded an estimate of annual incidence in this community.

Second, the investigators are looking at possible "hidden" risk factors in people with outwardly normal hearts. Two recent studies have shown that sudden unexplained cardiac death (SUD, for short) tends to run in families—if one parent had SUD, a person's risk increases twofold, but if both parents had SUD, a person's risk increases ninefold. This tells researchers that genes could be an important risk factor. The genetic analysis portion of the research is expected to begin soon.

Third, the research team is exploring the possible significance of common heart defects that normally do not result in disease per se, including thickening of the heart wall (left ventricular hypertrophy) and mitral valve prolapse. Because such conditions are so common, they cannot be the only determining factor in triggering sudden death. However, researchers hypothesize that these conditions may interact with other factors, perhaps genetic, to play a role.

"Our work with CDC has not only made it possible for us to conduct this important research, but also to disseminate critical information to the community," Dr. Chugh said. In March 2004, his department hosted the first-ever statewide symposium on cardiac arrest management, where more than 150 EMS physicians, medical directors, system managers, cardiologists, emergency room nurses, and field paramedics gathered to learn about

- The advantages of incorporating newly researched drugs and therapies into the management of cardiac arrest.
- The benefits of a well-designed public access defibrillation program in their community.
- Selection of candidates who should receive the implantable defibrillator.
- New research that could help identify people at greatest risk for cardiac arrest.

For further information about the *Oregon Sudden Unexplained Death Study*, visit its Web site at http://www.oregonsuds.org.

Cardiovascular Disease and an Association with Gum Disease

Recent articles in peer-reviewed journals have documented a potential association between periodontal infection (gum disease) and coronary heart disease and stroke. This emerging body of evidence suggests that, in addition to being a major cause of tooth loss in adults, severe periodontitis (loss of the supporting gum and bone tissue) may be a contributing risk factor for these systemic diseases.[1, 2]

Periodontitis is a chronic infectious disease that affects approximately 34% of the American population over age 30 (about 36 million people). About 5%–15% of adults have a severe form of periodontitis, which often leads to tooth loss. The disease begins as an acute inflammation of the gum tissue known as gingivitis; its major symptom is bleeding, especially upon tooth brushing. In susceptible individuals, particularly in the absence of recommended professional and self-care, gingivitis can progress to periodontitis, in which the destructive inflammatory process extends into the underlying bone.

Several systemic responses to chronic periodontal infections may increase risk for atherosclerosis, which, in turn, can precipitate a heart attack or stroke. People with severe periodontal infections often have elevated levels of serum C-reactive proteins (CRP), a biomarker for systemic inflammation. Experimental and observational studies (including cross-sectional and prospective studies) from inside and outside the United States have linked periodontal infections with coronary heart disease and stroke. This link is consistent with other evidence suggesting chronic infections may play an etiologic role in cardiovascular diseases.

Periodontitis and cardiovascular diseases share several common risk factors, in particular, smoking. Some researchers suggest that the two diseases may be comorbid conditions that result from smoking. A 2000 CDC study found that current cigarette smokers were four times more likely than nonsmokers to have periodontitis.[3] Thus, smoking cessation is key both to prevention and treatment of periodontitis.

In April 2003, CDC convened health researchers, state dental directors, professional association members, and other public health professionals to discuss public health implications of chronic periodontal infections in adults. Presentations focused on the existing science regarding associations between periodontal infections and cardiovascular diseases, respiratory infections, diabetes, and poor reproductive outcomes such as preterm delivery. Proceedings of the conference will be published in the Fall 2004 issue of the *Journal of Public Health Dentistry* and will be available on the CDC Oral Health Web site at http://www.cdc.gov/OralHealth.

Although a number of studies have investigated the relationship between periodontal and cardiovascular

diseases, results have been mixed—some studies reported a relationship and others, none. That inconsistency may stem from differences in study designs, outcome measures of cardiovascular disease, and case definitions of periodontal disease.

"Methods currently used to assess periodontal disease are very labor-intensive. Typically, they involve multiple clinical measures, up to six per tooth, and require a dental professional to estimate in millimeters the cumulative loss of supporting tissue," stated Dolores M. Malvitz, DrPH, a CDC oral health researcher. "This gold standard limits our ability to determine disease prevalence in selected population groups."

To respond to this need for measures that can be used more broadly, CDC has collaborated with the American Academy of Periodontology (AAP); a work group was convened, chaired by Robert Genco, DDS, PhD, Professor and Director of the Periodontal Disease Research Center, State University of New York at Buffalo and Editor of the *Journal of Periodontology*. During its 2-year life, the work group will identify reliable and valid self-reported surveillance measures for periodontal infections, as well as possible sentinel sites, events, providers, and payers. At the group's second meeting last October, work group members presented findings

from existing research on potential self-reported measures for periodontal infections. Currently, work group members are evaluating these candidate measures.

"Better surveillance of periodontal disease will allow state oral health programs to develop and target preventive interventions, including education in self-care; such efforts should improve the oral health of adults," stated Dr. Malvitz.

[1]Lowe GD. The relationship between infection, inflammation, and cardiovascular disease: an overview. *Annals of Periodontology* 2001;6(1):1–8.

[2]Beck JD, Offenbacher S. The association between periodontal disease and cardiovascular diseases: a state-of-the-science review. *Annals of Periodontology* 2001;6(1):9–15.

[3]Tomar SL, Asma S. Smoking-attributable periodontitis in the United States: findings from NHANES III. *Journal of Periodontology* 2000;71:743–751.

Smoking Bans Can Reduce Heart Attacks

Helena, Montana, drew the attention of CDC scientists who study heart disease and the health effects of smoking when a clean air ordinance banning smoking in public was rescinded after being in effect for 6 months. That's when hospital admissions for heart attack, which had dropped by 40%, rebounded after the ordinance was suspended.*

Terry Pechacek, PhD, Associate Director for Science in CDC's Office on Smoking and Health (OSH), and Stephen Babb, MPH, Coordinator of OSH's Secondhand Smoke Work Group, say that even half an hour's exposure to secondhand smoke could significantly increase the chance of having a heart attack. They warned that nonsmokers should avoid enclosed areas where smoking is permitted, noting that the study supports other evidence that tobacco smoke, by causing blood to clot, can trigger heart attacks in some people.

"We would never design a randomized study that assigned nonsmokers to either frequent exposure to secondhand smoke or no exposure because of the obvious danger to participants," said Dr. Pechacek, "but the Helena natural experiment does dramatically demonstrate the cardiovascular risks of exposure to secondhand smoke." He emphasized the need to replicate the results measuring the reduction in exposure levels resulting from such ordinances and to confirm expected size of the prevention effects on heart attack rates.

*Sargent RP, Shephard RM, Glantz SA. Reduced incidence of admissions for myocardial infarction associated with public smoking ban: before and after study. *BMJ* 2004;328:977–980.

Correction: In CDNR volume 16, no. 2/3 (Winter/Spring/Summer 2004), page 24, we incorrectly identified Wake County, North Carolina as Rick County. There is no Rick County in North Carolina. We apologize for the error.

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Conferences

Second National CDC Prevention Conference on Heart Disease and Stroke

The Second National CDC Prevention Conference on Heart Disease and Stroke, with the theme "Charting the Course," will take place August 17–19, 2004, at the Crowne Plaza Ravinia in Atlanta, Georgia. The conference will provide opportunities for information sharing, networking, and skill-building for state health department staff members, cardiovascular health partner organizations, students of public health, public health practitioners, and representatives from voluntary health organizations. Attendees will expand their knowledge of the current and emerging developments in heart disease and stroke prevention and learn about policy and environmental strategies for promoting cardiovascular health. For the latest information on the conference, visit http://www.cdc.gov/cvh.

CityMatCH Urban Maternal and Child Health Conference

The theme of this year's Annual CityMatCH Urban Maternal and Child Health (MCH) Leadership Conference is "Expedition 2004: Exploring the Boundaries of Urban MCH." The conference will take place September 11–14, 2004, in Portland, Oregon. Conference goals are to survey what information is needed to strengthen communities and better meet the needs of urban women and children, discover how to translate this knowledge into action, and prepare to influence others to advocate for the health of women, children, and families. For more information, visit http://www.citymatch.org/Expedition2004.htm or contact Ms. Jennifer Skala at 402/561-7500 or jskala@unmc.edu.

National Public Health Initiative on Diabetes and Women's Health

The National Public Health Initiative on Diabetes and Women's Health is sponsoring a Partners' Update Conference September 20–21, 2004, at the Westin Savannah Harbor Resort Hotel in Savannah, Georgia. Partners of the initiative will update attendees on the progress of their diabetes programs and research and demonstrate how these projects are aligned with the implementation strategies of the National Agenda for Public Health Action, which is designed to guide the nation in addressing diabetes and women's health issues. For more information about the initiative, visit http://www.cdc.gov/diabetes/projects/women.htm. For more information about the conference, please contact Ms. Michelle Owens at 770/488-5014 or mowens1@cdc.gov.

Conferences - *continued*

Second International Conference on Women, Heart Disease and Stroke

CDC is a cosponsor for the Second International Conference on Women, Heart Disease and Stroke, which will take place February 16–19, 2005, at the Loews Royal Pacific Resort in Orlando, Florida. The goal of the conference is to extend knowledge and foster action globally in preventing, identifying, and treating heart disease in women. For more information, visit http://www.americanheart.org/presenter.jhtml?identifier=3022283.

National Conference on Chronic Disease Prevention and Control

The 19th National Conference on Chronic Disease Prevention and Control, sponsored by CDC, the Chronic Disease Directors, and the Prevention Research Centers Program, will take place March 1–3, 2005, at the Marriott Marquis in Atlanta, Georgia. The theme is "Health Disparities: Progress, Challenges, and Opportunities." This conference is an ideal opportunity to network with other public health professionals at the national, state, and local levels and learn the latest strategies in preventing chronic disease and promoting health. More information is available at http://www.cdc.gov/nccdphp/conference/index.htm.

Communications

A Public Health Action Plan to Prevent Heart Disease and Stroke

Health and Human Services Secretary Tommy Thompson introduced *A Public Health Action Plan to Prevent Heart Disease and Stroke* at the "Steps to a HealthierUS: Putting Prevention First" conference held in Baltimore in April 2003. The *Action Plan* provides health practitioners and policy makers with a blueprint for addressing both treatment and prevention of heart disease and stroke, the nation's first and third leading causes of death and disability. The *Action Plan* describes the need for urgent action to prevent heart disease and stroke and also provides a framework for developing a health care system that supports both prevention and treatment. Representatives from several organizations, including American Heart Association/American Stroke Association, Association of State and Territorial Health Officials, and private-sector partners, will work with CDC to provide national leadership to implement the plan and reverse the epidemic of heart disease and stroke. For more information or free copies of the *Action Plan*, call 888/232-2306 (toll-free inside the United States), e-mail ccdinfo@cdc.gov, or visit the Web site: http://www.cdc.gov/cvh.

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State Programs in Action

CDC's 2004 publication, *State Programs in Action: Exemplary Work to Prevent Chronic Disease and Promote Health*, includes examples of state-based programs that encourage healthy behaviors and reduce chronic disease risk factors. This publication highlights more than 60 programs throughout the United States that are reaching people in various states and communities with interventions to prevent and control cancer, diabetes, and heart disease and stroke. Some examples address health promotion topics such as improving nutrition and increasing physical activity, while others describe programs that target reducing risk factors such as tobacco use. *State Programs in Action* is a guide for improving public health with project descriptions that range from reducing health disparities to promoting oral health and safe motherhood. To view online or download, visit http://www.cdc.gov/ncccdphp/exemplary/download.htm.

To order, please contact CDC, National Center for Chronic Disease Prevention and Health Promotion, Mail Stop K–40, 4770 Buford Highway, NE, Atlanta, GA 30341-3717, call 770/488-5706, or e-mail ccdinfo@cdc.gov.

The Burden of Chronic Diseases and Their Risk Factors

CDC recently posted the new "burden book" entitled *The Burden of Chronic Diseases and Their Risk Factors: National and State Perspectives 2004*. This online publication includes updated information on the burden of chronic diseases and their risk factors in the 50 states and the District of Columbia. The burden book provides a national perspective on chronic diseases as major causes of death; state-specific data on rates of death due to heart disease, cancer, stroke, and diabetes; information on the prevalence of risk factors for chronic diseases; information on CDC funding to states for chronic disease programs; and much more. This resource is an excellent tool for policy makers, public health professionals, and others interested in addressing the burden of chronic disease in the United States. To view or download this document, visit http://www.cdc.gov/nccdphp/burdenbook2004.

Communications - *continued*

Take Charge of Your Diabetes

Take Charge of Your Diabetes (Take Charge), 3rd edition, 2003, is now available through CDC's National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation. *Take Charge* is an easy-to-read book with basic information and positive steps to help people with diabetes control their blood glucose and prevent diabetes complications. Readers are encouraged to work with their health care team to achieve and maintain glucose control and to get the necessary tests to monitor their diabetes and detect problems early. Readers are prompted to seek support from their family, friends, and community; to make healthy choices on a daily basis; and to give support to others in their community. This book is in the public domain. Anyone may reproduce any or all of the contents. It is available on the Internet at http://www.cdc.gov/diabetes/pubs/tcyd/index.htm, or you can call toll-free 877/CDC-DIAB (232-3422) for more information or a copy of this book and others. *Take Charge* is also available in Spanish. Both versions (Spanish and English) are available to eligible persons in Braille and a recorded format at the National Library Service for the Blind and Physically Handicapped (NLS) at http://www.loc.gov/nls.

The National Public Health Initiative on Diabetes and Women's Health

On March 25, 2003, Secretary Tommy Thompson introduced a national plan to address the growing epidemic of diabetes in women. *The National Agenda for Public Health Action: The National Public Health Initiative on Diabetes and Women's Health* is designed to mobilize the nation to address diabetes among women as a growing health concern. At this press conference, Secretary Thompson made the announcement among representatives from national organizations who are working to implement the initiative, including the cosponsoring organizations: CDC, American Diabetes Association, and Association of State and Territorial Health Officials. For more information, visit http://www.cdc.gov/diabetes/projects/women.htm.

Preventing Chronic Disease

Preventing Chronic Disease (PCD) is a peer-reviewed electronic journal established to provide a forum for public health researchers and practitioners to share study results and practical experience. The mission of the journal is to address the interface between applied prevention research and public health practice in chronic disease. PCD focuses on preventing chronic diseases such as cancer, heart disease, diabetes, and stroke—the leading causes of death and disability in the United States. For more information, visit http://www.cdc.gov/pcd.

Asthma Resources for School or Community Health Programs

The American Lung Association, in cooperation with CDC's Division of Adolescent and School Health, launched the Asthma-Friendly Schools Initiative (AFSI) in October 2003. The goal of AFSI is to help local communities, asthma coalitions, and lung associations assist schools in developing comprehensive asthma management plans and programs. The American Lung Association, in collaboration with national partners, also developed an Asthma-Friendly Schools Toolkit and Asthma Incident Reporter (AIR) database. The Asthma-Friendly Schools Toolkit is a guide to designing a customized comprehensive asthma management program. The AIR database is a case management database designed for school nurses to track students with asthma and can produce both individual reports and summary reports. All AFSI materials are free and may be modified for local implementation. All materials are available and can be downloaded from the American Lung Association Web site at http://www.lungusa.org. For more information, you may call the American Lung Association at 800/Lung-USA.

The STARBRIGHT Foundation, in cooperation with CDC's Division of Adolescent and School Health, developed the "Implementation Guide for School Use" as a companion document for STARBRIGHT's "Quest for the Code," an educational CD-ROM game for children and teenagers with asthma. This powerful tool instructs children to identify asthma triggers such as environmental tobacco smoke, addresses asthma management skills, and includes a three-dimensional tour of the lungs. The CD-ROM comes with a parent guide containing asthma-related information and links to online resources. The parent guide and CD-ROM are in both English and Spanish. In addition, CDC funds are used to distribute the CD-ROM and Implementation Guide as a package. The Starbright Foundation develops products (including CD-ROMs on cystic fibrosis, sickle cell disease, and diabetes) that empower seriously ill children to deal with health and emotional challenges and medical procedures. The "Quest for the Code" CD-ROM is free to parents and others (such as community or school health workers or administrators) who work with children with asthma. For more information, visit http://www.starbright.org or call 800/315-2580.

Communications - *continued*

Recommended Infection Control Practices for Dentistry

CDC has published the new *Guidelines for Infection Control in Dental Health-Care Settings, 2003*. This report, a major update of the 1993 CDC guidelines, consolidates recommendations for preventing and controlling infectious diseases and managing occupational health and safety issues related to infection control in dental settings. The guidelines are designed to assist dental health care personnel in preventing occupational exposures to bloodborne pathogens, controlling infections associated with contaminated medical devices or surgical instruments, and preventing occupationally acquired infections. The publication includes a review of the scientific evidence regarding dental infection control issues and consensus evidence-based recommendations. It is available at http://www.cdc.gov/OralHealth/infectioncontrol/index.htm.

Information Sources

2003 Youth Risk Behavior Survey (YRBS) Data

CDC is pleased to announce the release of the *2003 Youth Risk Behavior Survey Surveillance Summary* and the 2003 national YRBS data. The Youth Risk Behavior Surveillance System (YRBSS) monitors six categories of priority health risk behaviors: behaviors that contribute to unintentional injuries and violence, tobacco use, alcohol and other drug use, sexual behaviors, unhealthy dietary behaviors, and physical inactivity. The *Surveillance Summary* includes results from the 2003 national YRBS and from 32 state and 18 local YRBS. The *Surveillance Summary*, the national YRBS data files, data documentation, and Youth 2003 Online (a Web-based data query system) are located at http://www.cdc.gov/yrbss.

Behavioral Risk Factor Surveillance System Data

CDC's National Center for Chronic Disease Prevention and Health Promotion is pleased to announce the release of the 2002 Behavioral Risk Factor Surveillance System data.

The Behavioral Risk Factor Surveillance System (BRFSS) is a unique, state-based surveillance system active in all 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. Information on health risk behaviors, clinical preventive health practices, and health care access is obtained from a representative sample of noninstitutionalized adults aged 18 or older in each state. The BRFSS provides flexible, timely, and ongoing data collection

that allows for state-to-state and state-to-nation comparisons. State-specific data, including racial- and ethnic-specific data from the BRFSS, provide a sound basis for developing and evaluating public health programs, including programs targeted to reduce racial and ethnic disparities in health risks. The BRFSS is the largest telephone-based surveillance system in the world: 247,977 interviews were conducted in 2002.

The 2002 BRFSS data are located at http://www.cdc.gov/brfss. If you have questions, please contact Dr. Lina Balluz, Behavioral Surveillance Branch, at 770/488-2466.

BRFSS Selected Metropolitan/Micropolitan Area Risk Trends (SMART)

CDC's National Center for Chronic Disease Prevention and Health Promotion is pleased to announce the release of the 2002 Behavioral Risk Factor Surveillance System (BRFSS) Selected Metropolitan/Micropolitan Area Risk Trends (SMART) data. As the use of BRFSS data has increased, there has been a greater demand for local-level data. Although the BRFSS was designed to produce state-level estimates, growth in the sample size has allowed researchers to produce smaller-area prevalence estimates. This new analysis of 2002 BRFSS data has yielded estimates for 98 metropolitan and micropolitan statistical areas. Estimates were also calculated for those counties within these 98 metropolitan and micropolitan areas in which there was a large enough sample size. For the first time, health officials will have access to local-level data that are comparable across the nation. This new use of BRFSS data fills a critical public health need for local area surveillance data to support targeted program implementation and evaluation, and can help local health officials plan and direct their prevention efforts. The 2002 BRFSS SMART data will be available in late November. Please visit http://www.cdc.gov/brfss for more information.

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