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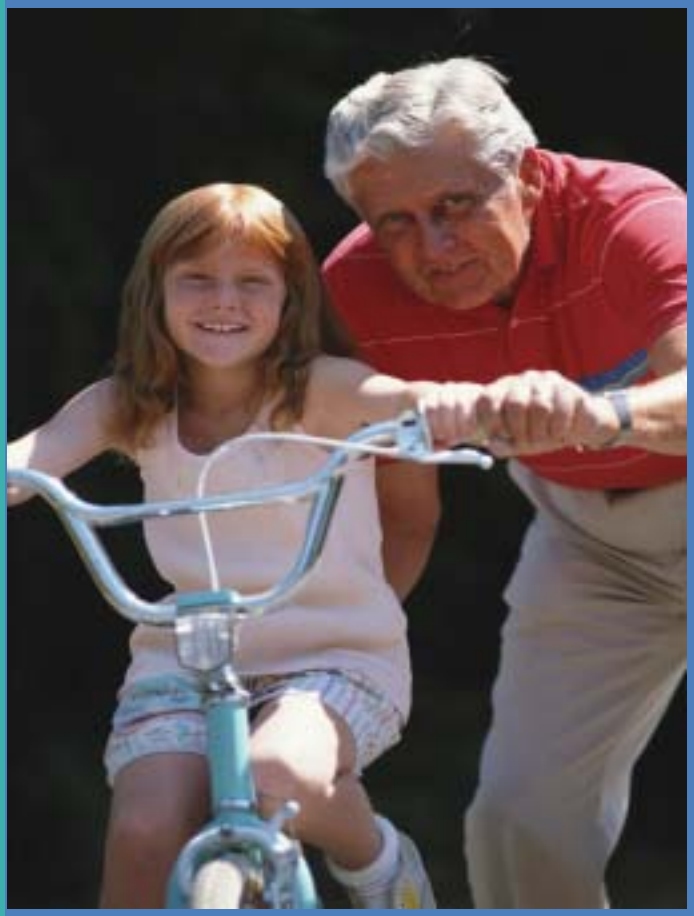
Chronic Disease Prevention

Promising Practices in Chronic Disease Prevention and Control



A Public Health Framework for Action

2003

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Promising Practices in Chronic Disease Prevention and Control: A Public Health Framework for Action

2003

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Message from James S. Marks, MD, MPH
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Public health agencies today face numerous challenges in their efforts to prevent and control chronic diseases and promote better health within the populations they serve. These challenges include the enormity of the disease burden, the limited resources for reducing that burden, and the wide range of opportunities for interventions. Each of these challenges becomes even more compelling in light of the sizable disparities in avoidable disease burdens between rich and poor and minority and majority.

What works? What elements comprise an effective program? What can public health bring to the table? The purpose of this book is to help answer these questions, help public health practitioners adopt proven, effective interventions, and help state and local health departments establish comprehensive chronic disease prevention and control programs that target limited resources where they are most needed and will be most effective.

Chronic diseases, the nation's leading causes of death, illness, and disability, cause over 70% of the deaths and account for roughly an equivalent proportion of total health care costs in the United States—and if current trends continue, the proportion of deaths and health care costs attributable to chronic diseases will grow even higher as the population ages. It is imperative that public health systems work on health problems of such scope. Reasonably, public health activities might be only minimal if there were little that could be done besides intensive clinical care. Fortunately, that is not the case: vigorous, aggressive public health efforts are able to have great impact in preventing or greatly delaying chronic disease and associated disabilities.

The actions of public health practitioners should be in accordance with four key principles: *primacy for prevention, dependence on science, quest for equity and social justice, and interdependence*. Simply put, *primacy for prevention* means that people would rather not develop serious chronic illnesses or would like to delay their development as long as possible. This is not to down play the value of treatment or palliation, but merely to say that most people, given a choice, would prefer never to get the disease even if it were 100% curable. Much of the primary prevention opportunity lies outside of the doctor's office and is influenced heavily by individual behaviors that are themselves fostered or hindered by public policies, regulations, and institutional decisions. Public health's role is to call attention to these prevention opportunities, to promote their development, to educate the public and policy makers about the benefits of these policies and programs, and to advocate for their widespread application.

The second principle, *dependence on science*, means that all public health programs, policies, and educational efforts should be based on the best available scientific evidence. Without science, public health merely has an opinion like anyone else. At times, decisions must be made when the science is immature or incomplete. In these cases, we have to be honest with ourselves and accept that future science may require a change in those decisions. The dependence on science also means that it is part of

our responsibility to support science, do the science as appropriate, synthesize the scientific information, and use it to guide our decisions and programs. It also requires that we aggressively implement what we already know–moving science-based interventions from the bench to the trench. Finally, a dependence on science requires a strong ethic of, and commitment to, evaluation. Often this last component translates into the surveillance and tracking of disease burdens and risk factors in the population, as well as the periodic review of program effectiveness and efficiency.

The third principle of public health practice, *quest for equity and social justice,* is based on the recognition that although public health organizations have a responsibility for everyone, rich and poor, insured and uninsured, urban and rural, they have a special responsibility for the underserved and for those in greatest need. That means, even as we promote important preventive opportunities, we must pay attention to whether the poor and underserved have access to those opportunities. We must consider the need for more intensive programs or interventions for those who bear a disproportionately large burden of disease or who are in danger of being left behind as new interventions are applied.

The fourth principle of public health practice is that of *interdependence.* No important public health problem of our time can be solved by public health alone, or clinical care alone, or research alone. Chronic diseases and their risk factors are highly interrelated, with many forces affecting risk. Thus, reducing the burden of chronic diseases such as cancer, heart disease, stroke, diabetes and arthritis will require the involvement of our major societal institutions (e.g., schools, work sites, and houses of worship) and of community groups that work closely with key populations. This principle of interdependence demands that we develop community approaches for dealing with interrelated health problems and broaden our network of partners to include those for whom health may be a secondary consideration, but whose actions, or inaction, can profoundly affect the health of large segments of the population.

In summary, our priorities should be those where the science is mature enough to offer us reasonable hope of success when applied broadly; where the burden of disease is great; and, especially, where disparities across populations are cause for great concern. These criteria lead us easily and inevitably to the principal causes of death and disability: heart disease, cancer, stroke, obesity, diabetes, chronic lung disease, and arthritis, and to their principal risk factors: tobacco use, poor diet, physical inactivity, and alcohol misuse. Because many risk behaviors are established during childhood and adolescence, we are driven also toward interventions aimed at promoting healthy behavioral choices among young people so that they may carry them into adulthood. Among older populations who may be seeing the signs of early chronic disease, our strategies are aimed at 1) promoting healthier choices to slow the progress of disease, to reverse it where possible, and to prevent the development of complications, and 2) encouraging the use of screening and early diagnosis that can lead to a cure or to the delay of complications.

The chapters that follow provide concrete examples of how state and local health departments can apply these four principles, leverage their limited resources, and coordinate the efforts of all groups with a stake in chronic disease prevention and control. All of us at CDC's National Center for Chronic Disease Prevention and Health Promotion hope that you find this book useful, and that you avail yourselves of the many resources within our Center as you work to prevent and control chronic health problems throughout the nation.

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PROMISING PRACTICES IN CHRONIC DISEASE PREVENTION AND CONTROL: A PUBLIC HEALTH FRAMEWORK FOR ACTION

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State Programs: Leadership, Partnership, And Evidence-Based Interventions

Fran C. Wheeler, PhD

The Centers for Disease Control and Prevention (CDC) has developed this book to share its vision of how states and their partners can reduce the prevalence of chronic diseases and their risk factors by instituting comprehensive statewide programs. The recommendations for achieving this vision are based on prevention effectiveness research; program evaluations; and the expert opinions of national, state, and local leaders and public health practitioners, including CDC staff. In addition to describing some of the most promising practices available to state programs, the book provides numerous sources, including Web sites, that describe state and local examples of what can be achieved; state-of-the-art strategies, methods, and tools; and training opportunities. We hope that this book will provide a framework that will help state and local health departments build new chronic disease prevention and control programs and enhance existing programs.

This chapter provides a brief general overview of the role of state health departments in establishing comprehensive statewide chronic disease prevention programs. This role includes providing the following components critical to the success of such programs:

- Leadership.
- Epidemiology and surveillance.
- Partnerships.
- State plans.
- Targeted interventions in various settings.
- Evaluation.
- Program management and administration.

The ensuing chapters in this document discuss how to establish or improve state programs that target specific chronic diseases and risk factors. However, the following discussion is relevant for all such programs, including those at the local level.

LEADERSHIP: The state health department must be the unifying voice for the prevention and control of chronic diseases.

The leadership of state health departments is critical to ensuring that funding for comprehensive chronic disease prevention programs is stable, that these programs use funds efficiently, and that program efforts are targeted where they can make the most difference. State health departments must develop the capacity to manage these programs and secure the necessary resources to do so, including the technical expertise needed to plan, implement, and evaluate interventions in a variety of settings.

Because state health departments may not always have or be able to obtain such expertise in-house, their leadership role in obtaining assistance from potential partners is especially important. By bringing together all parties interested in chronic disease prevention and control, state health departments can help them coordinate their efforts, thereby reducing wasteful redundancies, creating cost-saving synergies, and targeting limited resources where they are most needed. State health departments should be a catalyst for change at all levels and in all sectors of the community as they engage multiple parties in a comprehensive, statewide approach to preventing and controlling chronic diseases.

Another important aspect of state health department leadership is communication. State health

departments must be able to articulate the health needs of state residents, convincingly argue how a comprehensive approach to chronic health problems will help meet those needs, and publicize the accomplishments of various program elements to ensure their continued funding and support. In short, state health departments must be both educator and advocate, as well as a leader in promoting cooperative working relationships among all entities interested in addressing chronic disease prevention and control.

EPIDEMIOLOGY AND SURVEILLANCE: State health departments must establish the burden associated with chronic diseases and frame the problem to be addressed.

Epidemiology and surveillance provide the foundation for chronic disease prevention and control services. Epidemiology is the study of the health of human populations; it includes defining health problems, identifying their causes, determining populations at greatest risk, and evaluating effectiveness of health programs and services. Public health surveillance, a core tool of epidemiology, is the ongoing, systematic collection, analysis, and interpretation of health data. Public health surveillance data should be the basis for the development and implementation of any public health program and should be disseminated freely to any group that will use them. An epidemiologic surveillance system is essential for establishing the burden of chronic disease, framing the problem to be addressed, and describing populations in greatest need of interventions.

To garner support for proposed programs, state health departments must describe the burden of chronic disease in terms that speak to a variety of audiences, including community residents, state leaders, and other decision-makers. This description should include the geographic and demographic distribution of diseases and risk factors and the identification of population segments (by age, race, sex, socioeconomic status, location, etc.) that are disproportionately affected. It should also identify disease trends, including trends in rates of disease-attributable deaths and disability, the age of people at disease onset, and the age of affected people at death.

State health departments can use these descriptions of disease burden to raise public awareness of the threat posed by chronic diseases and to mobilize partners to address these diseases in a comprehensive manner. These descriptions should also serve as the basis for developing comprehensive state plans, identifying priority populations and strategies, estimating program costs, and allocating resources.

Findings from chronic disease surveillance systems should be routinely communicated in easily understandable terms. State health departments can use surveillance data in stand-alone reports as well as in periodic updates of state plans. The ultimate goal of chronic disease surveillance efforts is to define the burden of disease and other program-related factors in a manner helpful to those involved in decisions affecting the development and implementation of prevention and control programs. To achieve this goal, however, state health departments must allocate sufficient resources and staff time to surveillance, data management, and reporting.

State health department surveillance systems should incorporate indicators for specific diseases and associated risk factors that were developed through a partnership among the Council for State and Territorial Epidemiologists (CSTE), the Association of State and Territorial Chronic Disease Program Directors (ASTCDPD), and the Centers for Disease Control and Prevention (CDC). (See “Indicators for Chronic Disease Surveillance: Consensus of CSTE, ASTCDPD, and CDC” [1999], www.cste.org.) These indicators provide a common set of measures for chronic disease surveillance and can be useful in establishing priorities and guiding the consistent implementation of chronic disease surveillance activities across the nation.

PARTNERSHIPS: State health departments must establish strong working relationships with other government agencies and with nongovernmental lay and professional groups.

State health departments must form alliances with other organizations willing to work together to achieve common goals. Such partnerships help provide diverse perspectives on specified health problems, give state officials access to key intervention channels within a community, provide at-risk populations an opportunity to participate in program planning, mobilize needed resources and expertise, and help ensure that identified health problems are treated as priorities. Some potential partners are obvious, such as voluntary health organizations that address the major chronic diseases—heart disease, cancer, diabetes, and arthritis. However, health departments must also reach out to the broader community and involve organizations that are not traditional partners in health programs. By forming such broad, multi-disciplinary partnerships, health departments and their various partners can more effectively identify populations most affected by a particular health problem, determine where resources are most needed, address barriers and gaps in service, generate support for reducing the burden of chronic disease, and identify and share "best practices."

State health departments should also work with academic institutions and other partners to ensure that research results are translated into sound public health practice and that program interventions are based on science. Because most activities are conducted at the local level, health departments should be especially diligent in soliciting the participation of local-level partners. This participation will help to ensure that the plan's design accounts for local contexts, including culture and resources, and that the plan is implemented as intended and supported by local leaders.

Coordination among partner organizations may be one of the most difficult challenges faced by state chronic disease programs. Potential partners can be expected to participate in a comprehensive approach to chronic disease prevention and control only if they are able to focus on their own issues even as they work synergistically with others. State health departments should identify a broad group of partners and strive for maximum buy-in, commitment, and investment from those partners. They should encourage partners to coordinate their activities and thus avoid unproductive duplication of effort. By strengthening existing alliances and building new relationships, state health departments can substantially leverage their own limited resources and gain access to the capacity and skills required to implement an effective comprehensive chronic disease prevention and control program.

STATE PLANS: State health departments must use data and work with partners to develop comprehensive state plans to guide program efforts.

State health departments, in cooperation with local health departments and partners, are responsible for developing state plans that describe what health problems will be addressed, how they will be addressed, and how program activities will be funded and evaluated. A state plan may be a single, comprehensive chronic disease control plan, a series of plans for separate categorical programs, or a combination of both. It should present strategic objectives and specify the roles of various partners in achieving them. To foster the widest possible support for any chronic disease program, officials should involve as many stakeholders as possible in developing, reviewing, and evaluating the program plan. Once developed, this plan should be reviewed and updated as progress is made or circumstances change.

State health departments may wish to use relevant *Healthy People 2010* objectives (www.healthypeople.gov) as a template in devising their chronic disease prevention and control plans. However, state plans should also reflect the unique assets and needs in each state. To accurately identify these needs and assets, state health departments and their partners

may need to conduct a thorough review of state health data, as well as an assessment of available expertise and resources.

Plans for comprehensive state chronic disease programs should identify priority health issues and at-risk populations and specify outcome objectives for each (e.g., decrease the rate of disease in a specified population from a current baseline level to a specified target level within a specified time period). They also should describe how proposed activities will be funded, as well as detail the proposed activities of each participating organization.

Plans for comprehensive state chronic disease programs should address the following issues:

- *Disease burden:* Describe the burden and impact of disease using the best available data. Use state-specific data if possible.
- *Rationale for proposed activities*: Provide evidence to support the strategies outlined in the plan, including a cost-effectiveness analysis of the proposed program (i.e., a comparison of current disease-associated costs to society with an estimate of such costs if the program were implemented).
- *Core capacities and functions*: Describe the basic capacities and functions needed to conduct a comprehensive, statewide chronic disease prevention and control program.
- *Existing capacity:* Describe the current resources within the health department and among partner organizations, as well as the additional resources needed to implement the proposed program.
- *Objectives, activities, and resources:* Describe program goals and measurable objectives and outline activities to achieve the objectives. For each objective and activity, describe the target population, the intervention channel(s) to be used, the evaluation plan, the resources needed, the partners involved, and the staff required.
- *Time line*. Provide a realistic time line for implementing activities, given available resources.

INTERVENTION: State health departments must identify specific targets for change (either population segments, organizations, or environments), choose the best channels through which to effect such changes, and select appropriate strategies for doing so.

The selection of interventions should be guided largely by health promotion theory, research results, evaluation findings, and program experience. (See the *Guide to Clinical Preventive Services* at odphp.osophs.dhhs.gov/pubs/guidecps and *The Guide to Community Preventive Services* at www.thecommunityguide.org.)

Targets for change: All interventions should be part of a comprehensive strategy that includes changing organizational practices and social policies as a means of promoting individual behavior changes. Most chronic disease programs will need to broaden their current behavioral change strategies so as to include these approaches as well as interventions that target individuals.

Individuals: Programs should identify the audience to be targeted (e.g., by age, sex, socioeconomic status, geographic location, media habits, or a combination of related factors). The target audience will usually be a population group with a relatively high prevalence of disease or secondary risk factors, limited access to information or services, or a higher risk of developing disease.

Organizations (or "Systems"): Organizations in the community can support individual behavior change in a variety of ways, from providing programs and services to creating policies and environments that enable people to make healthy choices. As a rule, programs should target those organizations (or "systems") most capable of affecting the health of the targeted population segment. For example, to change the health-related behavior and/or health status of children, chronic disease control programs might target schools, day-care centers, faith-based groups,

Boy and Girl Scouts, or youth sports groups. Health-promoting changes to a school "system" could include introducing a new curriculum, modifying school menus or food-preparation methods, or introducing new policies that require health training for all teachers. Such "system" changes can have a long-lasting impact on the people associated with these organizations and can often be made at little or no cost.

Environments: Because the environments in which people live, work, and play can substantially affect their health and health-related behavior, comprehensive chronic disease prevention programs should include health-promoting environmental interventions such as advocating for the passage of clean air ordinances or the establishment of safe and inviting venues for physical activity.

Channels: Channels for chronic disease prevention and control are the organizational avenues through which specific interventions reach targeted individuals and populations. In public health practice, there are four broad categories of channels for intervention: health care settings, workplaces, schools, and community organizations.

Health Care Settings: Health care settings are an important channel for public health interventions because up to 70% of the general population visits some type of health care facility each year. Such interventions are most effective if they include long-term counseling of patients, use culturally appropriate materials and methods developed specifically for health care settings, and are integrated with other educational resources in the community. When possible, family members and other caretakers should be recruited to support patients' attempted behavior changes. Health care organizations and health care professionals also can contribute substantially to system-level changes by adopting policies and practices that promote and protect health.

Workplaces: Workplaces are an important channel for chronic disease prevention and control efforts simply because people spend so much of their time there and are thus a potential captive audience for interventions, including health education campaigns, screening programs, and efforts to reduce occupational hazards. Health promotion and disease prevention are also "good business" for employers: effective programs should enhance productivity and decrease absenteeism, turn-over, and training costs.

Because most employees spend at least a third of their waking hours at work, workplaces can be an effective channel for influencing social norms in numerous health-related areas, including the level of acceptance of exposure to secondhand smoke and the extent to which people incorporate regular physical activity into their daily routine. Employers can also offer economic incentives to promote healthy behavior by employees as well as provide structured health education programs, self-help materials, and role modeling.

Work site interventions can also reach beyond employees to address family members and the broader community. Many large employers establish supportive relationships with local schools to promote programs that benefit students, and both large and small businesses can participate in community interventions and support changes in community policy.

Schools: Schools can be an effective channel for implementing chronic disease prevention and control interventions for children and adolescents. They provide a structured opportunity to reach young people with interventions or health policies designed to foster more healthful behavior and to provide both students and faculty members with the knowledge and skills necessary to adopt healthy behaviors. Schools also provide an opportunity to reach adults who may not be reached through other channels and to reinforce parents' messages to their children.

To be successful, comprehensive school health education programs must be supported by students'

families as well as the larger community and thus should be based on community needs, resources, and standards. Such programs can help students understand the biological and social aspects of health and the benefits of healthy behaviors, appreciate their responsibility for their own future health, strengthen their self-esteem and decision-making skills, improve their ability to resist negative peer influences, and even serve as positive role models for their fellow students.

Community Organizations: Community organizations provide an important channel for chronic disease prevention and control because they offer an opportunity to reach individuals who may not be reached through other channels. They can be particularly useful in reaching underserved groups such as undereducated, economically disadvantaged, rural, or minority populations. Community organizations include religious groups, unions, clubs, professional associations, community action groups, sports groups, voluntary health agencies, and social service groups.

By using such community organizations as channels for interventions, programs may garner support from community leaders who are members, as well as gain access to the resources of the organizations, both of which will help ensure the programs' long-term viability. Community organizations are often a "back-door" way to reach business leaders and elected officials.

Community organizations can provide leadership in changing community health conditions and norms, in promoting beneficial health policies, and in creating economic incentives for healthy behavior. Because of their credibility with community members, these local organizations are often able to educate the public about health-related issues, establish these issues as legitimate community concerns, and stimulate productive public discussion about them. Members of these organizations can also influence the attitudes of other community members and leaders by speaking at group meetings, in public forums, or to the media.

Strategies: Intervention strategies should be comprehensive, multifaceted, mutually reinforcing, culturally relevant, and based on the best current scientific evidence.

Skill Building: Although health education programs do not necessarily result in immediate behavior change, they are nonetheless valuable because they give participants the knowledge, skills, and confidence necessary to adopt healthier behaviors. A comprehensive approach to helping people make such changes should address multiple factors, including their knowledge and beliefs about a health issue, their motivation to change their behaviors, the skills they need to do so, the specific actions they need to take, and the reinforcement needed to adopt and maintain a healthier lifestyle. The effectiveness of education programs can also be improved by the use of incentives, self-help tools, and social support mechanisms. Education can be provided directly to target populations through the channels discussed in the previous section. Education also may be delivered to health care providers, school personnel, or others through indirect approaches such as distance learning, peer education, role modeling, and train-the-trainer programs.

Preventive Health Services: Screening and other preventive services are designed to detect and treat risk factors for disease at the earliest possible stage. These services, however, are most effective if offered in conjunction with educational efforts to motivate people to participate. Appropriate provider training and quality assurance monitoring are also critical to the success of such services. Screening programs should have clearly defined follow-up procedures for tracking participants with abnormal findings and strategies to ensure their compliance with treatment recommendations. Health care professionals usually provide preventive health services in clinical settings, but these services can also be provided in a variety of other settings, including work sites, schools, and community organization sites, and with the assistance of volunteers who are not health care professionals.

Media: Media channels include television and radio stations, newspapers, magazines, billboards, newsletters, and local computer networks. The information conveyed through such channels can be categorized as news, features, entertainment, editorials, or advertisements, any one of which may be the most effective media avenue for delivering a particular health message or for addressing a particular population segment. Social networks or influential individuals are sometimes referred to as informal or "small" media channels; word-of-mouth communications through such channels can play an important role in changing social norms affecting public health. All types of media channels, however, share one characteristic: they can cut across organizational lines that limit the previously described channels.

Using media channels to influence the health-related behaviors of individuals can be an expensive intervention. Media campaigns may be more cost-effective if used to complement or promote other interventions rather than as stand-alone interventions. Media also can be used to promote system-level change by framing a health issue as a public policy concern or by encouraging individuals and organizations to participate in creating more healthful public or private policies.

Policy: Changing the health-related policies of private organizations or governmental entities is another strategy for modifying the health behavior of individuals. The advocacy of private, or voluntary, policies can be as important as promoting the passage of public, or mandated, policies. In fact, persuading employers or schools to voluntarily adopt healthful policies (such as restrictions on smoking) can be a good way to lay the groundwork for the broader public adoption of such policies if the private adoption of them is shown to be effective. Although public policy initiatives will usually have a more far-reaching impact, instituting them can be time consuming and difficult, both because of outright opposition to them and because of disagreements among policy proponents about the details of the policy. Thus public health advocates should not become discouraged if it takes several years to formulate, pass, and enforce an effective governmental health policy initiative.

EVALUATION: State health departments must establish systematic approaches for determining whether their comprehensive chronic disease control program is being implemented successfully, whether this program is as efficient as it can be, and whether its objectives are being achieved.

Program officials should periodically review their progress toward accomplishing the goals and objectives in their program's plan and determine whether they need to redirect activities or resources. They should evaluate program components regularly, using both qualitative and quantitative measures.

Using methods that are congruent with the state plan, program officials should conduct process evaluations to objectively describe their progress in implementing various program elements. Process evaluation results should be used to guide adjustments to program plans and implementation strategies. Program officials must also evaluate the extent to which proven interventions are delivered, program workers are adequately trained, and the target audience did what was expected of them (e.g., attending intervention meetings or completing planned activities and assignments). Process evaluation components for a community-based program could include the number and demographic characteristics of people reached through the program and details of the program, including funding sources and program expenses.

Those who have a direct interest in the program's initiatives should have the opportunity to participate in evaluation activities, including devising the evaluation questions and specifying the type of evidence that will be viewed as credible in answering the questions. Such stakeholders may include those who participated in developing the state plan, health care providers, community representatives, and policy makers. In general, stakeholders who

participate in evaluating program initiatives will be more likely to find the evaluation results accurate and relevant and thus more likely to support program changes that may be dictated by those results. Partners not involved in evaluation efforts should be kept abreast of the progress and results of all evaluations and the potential relevance of these results to their activities and concerns. Evaluation results and lessons learned should be disseminated through written reports and presentations at local, state, and national meetings and conferences. Partner organizations can also be called upon to disseminate program evaluation results to their members and constituents.

State and local health department officials should identify the resources they have for conducting evaluations and any specific help they may need in structuring evaluations of chronic disease prevention and control programs. Some health departments have sufficient in-house capacity, while others obtain help from partners or through contracts with local colleges or universities. (For assistance in developing process evaluations, see The Community Toolbox [www.ctb.lsi.ukans.edu] and the CDC Framework for Program Evaluation in Public Health [www.cdc.gov/eval/framework.htm.])

PROGRAM MANAGEMENT AND ADMINISTRATION: State health departments must provide the consistent administrative, financial, and staff support necessary to initiate and maintain successful programs.

Building infrastructure is critical to the success of comprehensive state chronic disease prevention and control programs. Adequate resources, including trained staff, funding, and in-kind support from partners, are necessary to sustain program efforts and support the implementation of planned activities, as is the support of state health department leaders. Because program planning, development, implementation, and evaluation require the time and attention of a dedicated staff, such a staff should be in place before states attempt to institute a comprehensive chronic disease prevention program.

Such programs also must have a strong management structure and effective, efficient administrative systems that are both agile and auditable. Program components should be coordinated, and the program management structure should provide adequate fiscal and program oversight and facilitate effective communication among program participants and partners. Other keys to effective program operation include appropriate resource allocation, accountability for program results, clearly defined lines of authority, and an organizational structure that allows related program units to interface and interact easily.

Finally, because so much chronic disease funding is categorical (i.e., for programs targeting relatively narrow "categories" of diseases, risk factors, or people), managers of comprehensive chronic disease programs must focus on integrating categorical programs and thus reducing wasteful redundancies among them. Although CDC is one of the largest sources of funding for comprehensive state chronic disease prevention and control programs, these programs also receive support from other federal agencies, their own state government, and various private organizations. Program managers must coordinate all funding streams in a way that avoids duplication of efforts and ensures consistency in their comprehensive approach to improving the health of their constituents.

We anticipate regularly updating this publication to keep pace with the rapidly changing state of the art in applied science and practice in the field. However, we are confident that broader adoption of the promising practices presented throughout this book will result in stronger, more effective state chronic disease programs characterized by the following:

- Integration of categorical state programs to achieve better coordinated, more cost-effective, and comprehensive chronic disease prevention and control.

- Public health programs actively engaged with managed care and other health care providers to improve the quality of care and the quality of life for people living with chronic diseases.
- Improved access to care for uninsured and underinsured people, especially those who have or are at risk of developing chronic diseases.
- The incorporation of new discoveries of the genomics revolution into chronic disease prevention and control programs.
- Stronger and more diverse partnerships, including nontraditional partners such as transportation, media, and urban planning organizations.
- Improved use of media, including mass media, to transform how the public thinks about health and healthy lifestyles.
- Improved state and local policies and systems that support healthy living, including changes in school, workplace, community, and health care settings.
- Progress toward eliminating disparities in health and access to health care services.
- A solid infrastructure for chronic disease prevention and control at the state and local levels, with adequate and appropriately trained staff.
- Broad acceptance that funding for public health chronic disease programs is an essential expenditure that improves and safeguards the health and quality of life of state residents and yields a positive return on investment.

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Diabetes Prevention and Control: A Public Health Imperative

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Diabetes Prevention and Control: A Public Health Imperative

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The Burden of Diabetes Among Americans Continues to Grow

Type 2 diabetes, which affects 17 million Americans and their families,[1] often causes severe complications that can ultimately damage every organ in the body and lead to premature death. These complications include heart disease, blindness, lower extremity arterial disease, kidney failure, dental disease, and increased susceptibility to infections. In many states, half of all people with diabetes do not receive recommended preventive care services that are known to reduce the risk of diabetes complications.[2] The direct economic cost of diabetes in the United States is estimated to be about $100 billion per year.[3] This figure does not take into account the indirect economic costs attributable to potential work time lost to diabetes-related illness or premature death.

The prevalence of diagnosed type 2 diabetes increased sixfold in the latter half of the last century.[4] Diabetes risk factors such as obesity and physical inactivity have played a major role in the dramatic increase in rates of type 2 diabetes in recent years. Age, race, and ethnicity are also important risk factors. The prevalence of diabetes increases with age in all racial and ethnic groups. Whereas 8.6% of Americans over age 20 have diabetes, 20.1% of Americans over age 65 have diabetes. Far fewer Americans younger than age 20 have diabetes, but the prevalence of diabetes in this age group appears to be rising considerably. The rising prevalence of diabetes in this age group, as in other age groups, is attributed to increases in physical inactivity and obesity.

American Indians, black Americans, Latino Americans, and some Asian Americans and Pacific Islanders are disproportionately affected by diabetes.[1] For example, black and Hispanic Americans are almost twice as likely to have diabetes as non-Hispanic white Americans of similar age, and American Indians are almost three times as likely to have diabetes as non-Hispanic whites of similar age. As the prevalence of obesity and sedentary lifestyles increases and the U.S. population becomes older and more ethnically diverse, the prevalence of diabetes is expected to continue to rise.[5]

Socioeconomic and environmental factors may also play a role in a person's risk of developing diabetes and in the course of diabetes once it has developed.[5] People with type 2 diabetes are more likely to have less education and lower incomes than people without diabetes.[6] Elderly minority women, who are more likely to live alone and to have lower socioeconomic status, are also more likely to have diabetes and to lack resources to adequately manage their disease.[7]

Progress to Date

The last two decades have provided great advances in clinical care for people with diabetes. For example, in 1981, photocoagulation treatment was proven effective in preventing diabetes-related blindness.[8] Twelve years later, the results of the landmark Diabetes Control and Complications Trial (DCCT) established that intensive control of blood sugar greatly reduced microvascular complications among people with diabetes.[9] In 2002, findings from the Diabetes Prevention Program (DPP) demonstrated

that lifestyle changes and medications can help prevent diabetes in people with impaired glucose tolerance.[10]

Although diabetes cannot be "cured," these findings prove that the devastation of diabetes can be dramatically reduced. However, for many reasons, large segments of the population have not benefited from these findings. Without broader public health interventions and additional resources, the prevalence of diabetes is expected to continue to increase. This chapter discusses a model for public health action to improve the lives of people, communities, and populations affected by diabetes. This model is based on existing and emerging science and public health experience.

Population-Based Objectives for Diabetes Control and Prevention

Two national sources for population-based objectives for diabetes control and prevention are discussed in this section: *Healthy People 2010,* which lays out the nation's health promotion and disease prevention agenda for the decade, and the National Diabetes Prevention and Control Program, a cooperative effort between CDC and 50 state health departments and 9 jurisdictional health departments. Both sets of objectives are intended to guide state and national planning and coordination efforts.

Healthy People 2010 Objectives

Healthy People 2010 is the third version of the *Healthy People* series published by the Department of Health and Human Services in which it lays out 10-year health objectives for the nation. This document serves as a blueprint for identifying reasonable, science-based goals that can be modified as desired by state and federal agencies, local entities, and communities. *Healthy People 2010* includes 467 objectives in 28 focus areas.

In recognition of the significance of the burden of diabetes and its impact on multiple systems within the body, the nation's *Healthy People 2010* objectives include several related to diabetes.[11] Most of these involve secondary prevention (preventing complications of diabetes) or tertiary prevention (preventing the progression of complications). A few involve primary prevention (preventing diabetes itself).

Chapter 5, which focuses on diabetes, contains 17 objectives directly related to diabetes prevention and control. Many other chapters contain diabetes-related objectives. Table 1 lists the objectives from chapter 5. This list of objectives is matched to five goals that are essential to increasing the length and improving the quality of life for people with diabetes and to preventing diabetes among people at risk.

National Objectives of the National Diabetes Prevention and Control Program

In 1999, the National Diabetes Prevention and Control Program (NDPCP) established multi-year objectives that supported achieving specific *Healthy People 2000* objectives and subsequently *Healthy People 2010* objectives. Developed in collaboration with state partners and accounting for current science, existing state health department capacity, and resource constraints, NDPCP objectives are intended to guide federally funded program and evaluation efforts (see Table 2). Population-level improvements in preventive health care practices that delay or prevent diabetes complications are the major focus of state efforts supported by the national program. Objectives addressing the prevention of diabetes itself are expected in 2003–2004.

Prevention Opportunities

There is a strong scientific basis for the primary, secondary, and tertiary prevention of diabetes. However, translating the science into effective interventions to lessen the burden of diabetes requires considerable resources and effort.

Levels of Prevention

State diabetes programs should address three levels of diabetes prevention: primary, secondary, and tertiary.

Primary prevention interventions seek to delay or halt the development of diabetes. The most

compelling evidence for the effectiveness of primary prevention is for interventions targeting people with impaired glucose tolerance,[10] who are at highest risk of developing diabetes. Both drugs and lifestyle changes have proven effective in helping these people delay or prevent the development of diabetes, although lifestyle changes related to losing weight and increasing physical activity have been most effective.[10] Primary prevention efforts in state diabetes programs cover a wide spectrum. At a minimum, state diabetes programs should partner with other programs that assume responsibility for reducing risk factors in the population at large, such as those that provide broad nutrition and physical activity interventions. (See Chapter 6.) In such partnerships, diabetes programs play a supportive

Table 1. *Healthy People 2010* Objectives Directly Related to Diabetes Prevention and Control

	***Healthy People* 2010 Objectives Related to Goals for Diabetes Prevention and Control**	**Prevent risk factors for type 2**	**Detect & treat glucose intoler-ance**	**Detect diabetes**	**Control glucose in people with diabetes**	**Prevent compli-cations**	**Detect & treat diabetes compli-cations**
5-1	People with diabetes receive diabetes education	x			x	x	x
5-2	Prevent new cases diabetes	x					
5-3	Reduce rate diagnosed diabetes	x	x				
5-4	Increase rate diagnosed diabetes among people with diabetes			x			
5-5	Reduce diabetes death rate	x	x	x	x		x
5-6	Reduce diabetes-related deaths in people with diabetes				x	x	x
5-7	Reduce deaths from cardiovascular disease in people with diabetes				x	x	x
5-8	Reduce proportion pregnant women with gestational diabetes	x					
5-9	Reduce frequency foot ulcers in people with diabetes			x	x	x	x
5-10	Reduce proportion lower extremity amputations in people with diabetes			x	x	x	x
5-11	Increase proportion people with diabetes getting annual microalbumin					x	x
5-12	Increase proportion adults with diabetes getting at least annual A1c				x	x	x
5-13	Increase proportion adults with diabetes getting annual eye exam					x	x
5-14	Increase proportion adults with diabetes getting annual foot exam					x	x
5-15	Increase proportion adults with diabetes getting annual dental exam					x	x
5-16	Increase proportion people with diabetes taking aspirin at least 15x/month					x	
5-17	Increase proportion people with diabetes self-monitoring glucose				x	x	

rather than a leadership role. For example, diabetes programs could participate in coalitions that seek broad environmental changes to support walking. These coalitions would typically be developed, sponsored, and led by state nutrition and physical activity programs. On the other hand, diabetes programs should play a leadership role in primary prevention interventions focused on ensuring that people at highest risk for diabetes have access to interventions that will delay or avert the development of the disease. The leadership role may entail aggressively soliciting partnerships with cardiovascular health, nutrition, and physical activity programs to develop lifestyle change interventions.

Secondary and tertiary prevention interventions focus on people with diabetes and seek to prevent (secondary) or control (tertiary) the devastating complications of this disease. More proven intervention models are available for both secondary and tertiary prevention than for primary prevention. For example, maintaining near normal glucose, blood pressure, and cholesterol levels has been shown repeatedly to reduce diabetes complications.[10, 12] Additionally, routine preventive care practices such as foot exams, eye exams, and frequent A1C testing are well-established components of quality diabetes care.[13] To ensure that these benefits reach the people who need them, ideal programs develop, implement, and coordinate multilevel interventions targeting people with diabetes, their families, their health care systems, and their communities.

All three types of prevention interventions rely on active stakeholder involvement and support. Stakeholders include people with diabetes, voluntary organizations that have an interest in diabetes or serve populations disproportionately affected by diabetes, health care providers (e.g., primary care providers, endocrinologists, diabetes educators, eye care specialists), and academic institutions. However, program planners are encouraged to explore partnerships with organizations (e.g. urban planning groups, restaurant associations) that may not traditionally work with the diabetes community but can assist in implementing interventions.

Achieving population-level impact in the primary, secondary, and tertiary prevention of diabetes is a complex task that requires resources, competent leadership, and a diverse staffing mix at the national, state, and provider levels. State diabetes programs should collaborate with a wide variety of partners to ensure an appropriate balance between efforts to prevent diabetes complications and efforts to prevent the onset of diabetes. The ability to capitalize on

Table 2. National Diabetes Control Program Objectives

1. By 2008, demonstrate success in achieving an increase in the percentage of people with diabetes in your jurisdiction who receive the recommended foot exams.
2. By 2008, demonstrate success in achieving an increase in the percentage of people with diabetes in your jurisdiction who receive the recommended eye exams.
3. By 2008, demonstrate success in achieving an increase in the percentage of people with diabetes in your jurisdiction who receive the recommended vaccinations.
4. By 2008, demonstrate success in achieving an increase in the percentage of people with diabetes in your jurisdiction who receive the recommended A1C tests.
5. By 2008, demonstrate success in reducing health disparities for high-risk populations with respect to diabetes prevention and control.
6. By 2008, demonstrate success in linking to programs for promotion of wellness and physical activity, weight and blood pressure control, and smoking cessation for people with diabetes.

Source: CDC, Division of Diabetes Translation, 2002

prevention opportunities requires a strong infrastructure to plan and support interventions, nurture partnerships, and monitor and evaluate progress.

Types of Strategies

State diabetes programs should pursue three major types of strategies: health systems change, community intervention, and health communications. These three strategies should be implemented at multiple levels and in tandem with each other.

Health Systems Change

The U.S. Task Force for Community Preventive Services strongly recommends disease and case management to improve diabetes clinical outcomes.[14] State programs should not only seek to improve preventive health care practices by providers and people with diabetes, but also seek to redesign health care processes related to diabetes care.

Strategies to improve health care systems and access to quality care can address either the primary, secondary, or tertiary prevention of diabetes. Such strategies addressing primary prevention might aim to identify more people with impaired glucose tolerance by increasing screening among populations at high risk, including obese people, people over age 45, and members of certain racial or ethnic groups. Health system change strategies addressing secondary and tertiary prevention might demonstrate the benefit of policy interventions that support self-management of diabetes (e.g., adding lay health workers to the staff of some medical practices, using information technology to communicate with people with diabetes outside of the provider's office,[15] expanding support for patients with diabetes as the source of control of diabetes care[16]).

Community Intervention

Community intervention strategies can combine aspects of primary, secondary, and tertiary prevention. Community intervention strategies aimed at the primary prevention of diabetes might include community-based exercise and healthy nutrition programs targeting people at high risk for diabetes. Community intervention strategies aimed at secondary and tertiary prevention might seek to increase the availability of influenza vaccinations or to provide diabetes education for people with diabetes in gathering places for adults.[14] Initiatives can also mobilize community members to improve access to care for people with diabetes, such as by establishing community diabetes support groups or by holding routine diabetes question-and-answer sessions at local pharmacies.[14] Other community intervention strategies might address broader issues that affect individuals with diabetes and their families and communities, such as the need for social support and stress reduction. For example, efforts could include advocacy for increasing the availability of diabetes education programs outside of normal working hours so that entire families are able to participate together.

Health Communications

Diabetes health communications interventions are based on consumer research and often involve raising awareness of diabetes and its complications by disseminating health information to targeted audiences. Health communications should be viewed as a complementary strategy tied to health systems change or community interventions. Health communications strategies are rarely effective as stand-alone activities.

Diabetes health communications strategies are appropriate for primary, secondary, and tertiary interventions. Possible primary prevention interventions include awareness campaigns targeting people with impaired glucose tolerance, as well as their health care providers and their employers. Secondary interventions include developing and disseminating targeted messages to address misconceptions about flu and pneumococcal immunizations. Tertiary interventions include developing and disseminating targeted messages to increase rates of foot examinations for special populations.

CDCynergy, a CDC-developed CD-ROM to help organizations plan health communications activities,[17] suggests that the development of health communications initiatives should include the following steps:

- Defining and describing the problem.
- Analyzing the problem.
- Identifying and profiling audiences.
- Developing a communication strategy and tactics.
- Developing an evaluation plan.
- Launching the initiative and gathering feedback from participants.

Program planners are encouraged to review the experience of programs in other states or communities. However, these programs should be viewed as guides and not templates, since interventions usually need to be tailored to a particular population.

Basic State Infrastructure for Diabetes Control

Several components are necessary to ensure a complete state-based public health program in diabetes. The impact of state programs is maximized when all of these components have been put into action.

Surveillance and Evaluation

A complete state public health program must have information available to 1) define the nature and extent of the diabetes burden (surveillance), 2) focus intervention efforts, and 3) determine if interventions are having an impact (evaluation).

Surveillance

In June 2000, the Council for State and Territorial Epidemiologists published a list of indicators for diabetes surveillance (Table 3). These indicators cover a wide range of issues important for monitoring diabetes trends and for planning and evaluating diabetes program efforts. Other important indicators to follow include levels of physical activity and obesity, diabetes education, and self-monitoring of blood glucose. State programs should also monitor environmental changes that affect the course of diabetes, including state and federal health policy changes. In general, surveillance data are critical for monitoring state and national progress, including progress toward meeting *Healthy People 2010* objectives.

The following are the best-developed and most widely used sources of diabetes-specific state surveillance data:

Table 3. Diabetes Surveillance Indicators

1. Mortality from or with diabetes mellitus.
2. Mortality from or with diabetic ketoacidosis.
3. Diabetes mellitus prevalence.
4. Influenza vaccinations among adults with diabetes mellitus.
5. Pneumococcal vaccinations among adults with diabetes mellitus.
6. Foot exams among people with diabetes mellitus.
7. Dilated eye exam among people with diabetes mellitus.
8. Hospitalizations among people with diabetes mellitus.
9. Amputations of lower extremities attributable to diabetes mellitus.

Source: *Indicators for Chronic Disease Surveillance: Data Volume,* Council for State and Territorial Epidemiologists, 2000.

Behavioral Risk Factor Surveillance System (BRFSS), including the diabetes module. BRFSS is a state-based, random-digit-dialed telephone survey designed to yield representative population samples for each state. Each state should administer the BRFSS annually (including the special diabetes module) to monitor the extent of and trends in the diabetes burden, behavioral risk factors, and preventive care practices.

Hospital discharge data. These data are available in most states, sometimes for a fee, and are important for monitoring diabetes-related illness. However, hospital discharge data should be viewed as complementary to BRFSS and other data rather than as a sole source of information.

State vital records data. Data from death certificates and birth certificates are used for monitoring diabetes-related death rates and pregnancy outcomes. However, only about 40% of people who die with diabetes have diabetes listed on their death certificate. As a result, death certificate data cannot be used to monitor death rates, causes of death, and relative risk for death among people with diabetes unless the death certificate has been modified to collect data on decedents' diabetes status. The new standard birth certificate scheduled to be implemented in 2003 will collect data on whether the mother had either preexisting or gestational diabetes (diabetes diagnosed during pregnancy). This new information will help to determine the effects of diabetes on pregnancy and trends in diabetes-related birth defects.

Partnering health organizations such as provider groups, managed care organizations, and community health centers can be important sources of diabetes surveillance data. States are encouraged to supplement existing data with specialized surveillance efforts, such as special surveys of minority and other populations not adequately represented in available data sources.

Evaluation

Diabetes programs need to conduct evaluations to determine how effective their activities are in producing desired short-term and long-term effects. Logic modeling is a recommended tool for this purpose, and NDPCP has developed an evaluation framework based on the CDC model (Figure 1).[18] Because diabetes and its complications can take many years to develop and diabetes mortality data tend to be inaccurate, programs need to use intermediate measures of success as part of their evaluations.[19] Good process evaluation is also essential to understanding why a program is or is not achieving results and to know how to adjust the program accordingly.[20] Ultimately, however, the success of a program is determined by its long-term success in reducing diabetes incidence, illness, complications, and deaths. Evaluation of progress toward more intermediate objectives should always be conducted with those long-term objectives in mind.

State Plans

The development of a strategic plan is critical to the success of state and local diabetes programs. Stakeholders should be actively involved in developing, reviewing, and evaluating the plan. Once developed, plans should be reviewed and updated as progress is made or circumstances change. Ideally, the plan's goals and objectives should be tailored to national, state, and local needs, and strategies for achieving these goals and objectives should be based on proven and evaluated experiences whenever possible.

The diabetes objectives in *Healthy People 2010* (Chapter 5)[21] provide a template for national, state, and local efforts to prevent and control diabetes. The National Diabetes Prevention and Control Program objectives (Table 2) also provide a reference point for prevention and control efforts. Although state plans can include objectives and activities that are not covered by either of these national blueprints, such efforts sacrifice opportunities for creating synergy

between national, state, and local programs and for efficiently using resources.

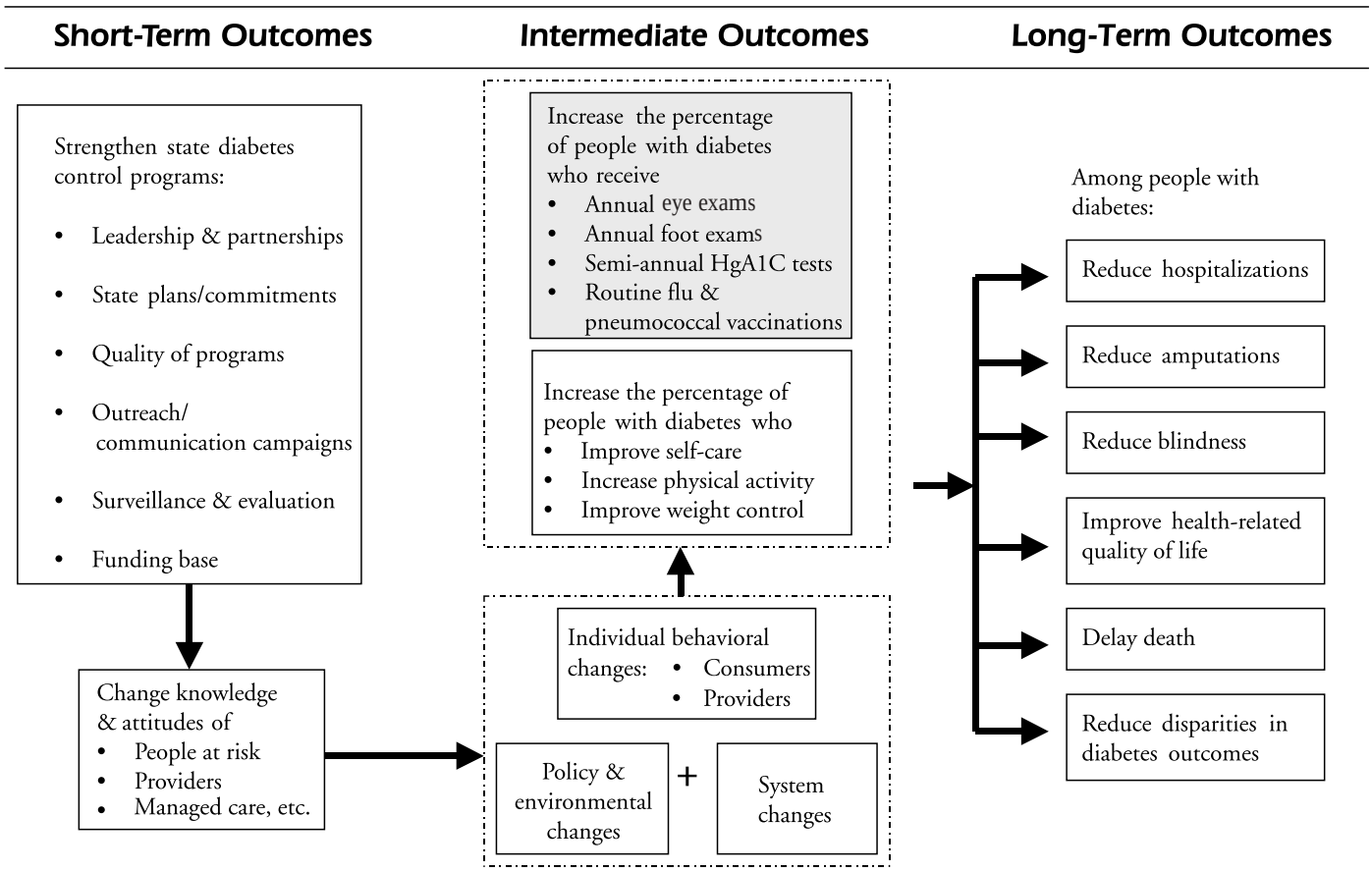
Plans should address the primary, secondary, and tertiary prevention of diabetes and should describe the roles and responsibilities of the various partners. At a minimum, these roles should be described as supportive or leadership. For state programs, this distinction is especially useful in primary prevention activities, because leadership for some interventions to reduce obesity in the general population is more suitable for other public programs.

Partnerships

State diabetes programs should collaborate with partners to facilitate and coordinate various efforts to prevent and control diabetes. Programs can bring together partners through special initiatives, topical meetings, and issue-specific planning. Partners can include professional organizations, voluntary diabetes organizations, community health centers, employers and other health care purchasers, community organizations, businesses, schools, and faith-based organizations.

If possible, state diabetes programs should also establish an advisory board consisting of representatives of partnership groups and other key members of the diabetes community. The activities and membership of these boards should be strategically planned to strengthen and help guide program efforts. Population-level changes invariably require action by particular groups. Therefore, engaging these groups in strategy and planning is key to selecting appropriate and effective interventions and securing commitments of resources. In addition,

Figure 1. Diabetes Prevention and Control Program



advisory boards can help coordinate state diabetes control efforts with similar efforts of other private- and public-sector partners across the state.

Policy

Another important role of state diabetes programs is to help private organizations and federal, state, and local agencies design policies that optimize the health of people with and at risk for diabetes. Most commonly, these programs provide guidance about a population's need for diabetes care services and resources. They also should provide information, on request, to state legislators and governors as they develop regulations concerning insurance benefits for people with diabetes (e.g., for diabetes supplies and self-management education) or expanded coverage for people at risk for diabetes (e.g., for nutrition counseling for people with impaired glucose tolerance). By tracking changes in laws and regulations over the years, monitoring their health impact, and offering technical assistance to public- and private-sector policy makers, state diabetes programs can substantially influence the development of new policies. To be effective in this role, however, state programs must be able to provide accurate assessments of science and public health initiatives related to diabetes.

The role of diabetes programs in policy change efforts varies from case to case. When the policy in question relates exclusivly to diabetes, diabetes programs should take the lead. However, when the policy in question involves broader public health concerns, including diabetes, it may be more appropriate for the program to play a supporting role in larger partnership efforts.

Examples of policy initiatives include those that

- Promote work environments conducive to healthy eating and exercise for people with or at risk for diabetes.
- Provide more support and flexibility for people with diabetes to administer insulin injections or monitor blood glucose levels at school or at work.
- Increase the accessibility of safe places to exercise (e.g., expanded availability of community school resources for physical activity).

Staffing

The most critical staffing area for state diabetes programs is program leadership, which typically consists of the program director and program coordinator. The director is responsible for guiding, planning, and monitoring public health programs. The person filling this senior-level position should have access to senior policy makers and have a working knowledge of state health department programs. The coordinator reports to the director and is responsible for day-to-day program operations.

Other key staff members include an epidemiologist and program evaluator. The epidemiologist is responsible for developing and maintaining a comprehensive surveillance system to monitor diabetes incidence and related trends in risk factors and program effects. The program evaluator ensures that program interventions are regularly evaluated and provides continuous feedback on the impact of interventions to program staff. In small programs, the same staff member may have more than one of these responsibilities. In larger programs, several staff members may be assigned to each of these areas. Additionally, one or more staff members should be responsible for developing and maintaining partnerships.

Staff should have specialized skills in each of the major strategy areas (i.e., health systems change, community interventions, and health communications). Staff responsible for health systems change should have direct experience in managing or working with health systems such as community health centers, state Medicaid programs, and insurance or health benefits programs. These staff members should be familiar with how health care is organized, financed, and delivered in the state. Staff responsible for community interventions should have experience and training in community

outreach and health education. Staff responsible for health communications should have training and experience in using social marketing concepts to develop and deliver health messages.

Programs can access medical expertise through a consultation arrangement. Programs should avoid excessive staffing with diabetes health care providers because these programs do not provide direct care.

Leadership

State Leadership

State programs provide leadership at the state level through advocacy, planning, partnering, and program support. State leadership activities often mirror and complement the federal leadership activities listed below but are limited to the state or locality. However, at other times state roles and activities are distinct and help to inform federal efforts. For example, state-funded pilot demonstrations sometimes influence the selection of future national program objectives. State diabetes programs also can provide leadership to other states through consultation, regional coalition building, and resource sharing.

Federal Leadership

CDC's diabetes division was established in 1977. In 1989, the name of the division was changed to Division of Diabetes Translation (DDT) to reflect the division's mission of translating information from clinical trials into clinical and public health practice. The vision of DDT is to reduce the preventable burden of diabetes in the United States. The division's strategy has these major components:

Define the diabetes burden through public health surveillance: The division continually strives to strengthen public health surveillance systems for diabetes. Working with the states, DDT is primarily using the diabetes-specific module of the Behavioral Risk Factor Surveillance System (BRFSS) to develop a nationwide, state-based surveillance system. The division is also establishing diabetes surveillance systems within managed care organizations. An additional DDT priority is improving the quality, accuracy, and timeliness of surveillance data for racial/ethnic populations and children, the two groups among whom the burden of diabetes is increasing most rapidly.

Conduct applied translational research: The division conducts applied research that focuses on translating research findings into clinical and public health practice. This research identifies the public health implications of results from clinical trials and scientific studies and applies these findings in the health care system. Areas of research include the following:

- Access to quality care for diabetes, especially within managed care organizations.
- Early detection of undiagnosed diabetes.
- Cost-effectiveness of diabetes prevention and control activities.
- Effectiveness of health practices to address risk factors for diabetes.
- Effectiveness of strategies to prevent type 2 diabetes.

Develop state-based diabetes prevention and control programs (DPCPs): CDC provides funding for DPCPs in all 50 states, the District of Columbia, and 8 U.S.-affiliated jurisdictions. The primary goal of these DPCPs is to improve access to affordable, high-quality diabetes care and services, especially for high-risk and disproportionately affected populations. The states funded for capacity-building focus on developing state health department expertise in planning, designing, and coordinating diabetes control activities. Sixteen states receive expanded funding to establish basic implementation programs that enable them to implement statewide, multilevel public health approaches to reduce the burden of diabetes.

CDC has advocated for partnerships between DPCPs and state-level efforts funded by other federal agencies. One well-documented effort has been a collaboration between the Health Resources and Services Administration (HRSA) and their network

of community health centers and state DPCPs. (See Diabetes Program Examples, page 2–13) These linkages have resulted in changes in both CDC's program and HRSA's program. A similar effort between CDC and the Centers for Medicare & Medicaid Services (CMS) to link state-based quality improvement organizations with DPCPs has resulted in several important demonstration projects.

Implement the National Diabetes Education Program (NDEP): The NDEP is a joint initiative sponsored by CDC and the National Institutes of Health. Through a network of more than 200 public and private organizations, the NDEP works to improve diabetes treatment, promote early diagnosis, and prevent the onset of diabetes. Program activities are directed to the general public, people with diabetes and their families, health care providers, payers and purchasers of health care services, and policy makers.

Coordinate media strategies and provide public information: CDC has expanded its capacity to meet a rapidly growing demand for information about diabetes and CDC's diabetes programs. Specific activities include the following:

- National satellite media and marketing training for partners and a national satellite broadcast.
- A national diabetes and flu awareness campaign.
- A public inquiries and publications request system that includes a toll-free telephone line (1-877-CDC-DIAB) that is answered in English and Spanish.
- An Internet site that receives about 1,000 visits a day.

Technical Assistance

Program consultants from CDC are assigned to specific states to provide ongoing guidance in implementing the National Diabetes Program model. These consultants assist each state with training, identifying resources, and solving problems. CDC also provides states with surveillance and epidemiology support on a case-by-case basis. CDC links with national organizations to foster new partnerships, support, and collaboration at the state level through affiliates. Extensive diabetes technical resources, references, and additional information are available on the Web sites listed on page 2–18. These Web sites also include links to other diabetes-related Web pages.

Professional Development and Training

Professional development for staff involved in diabetes prevention and control is essential to program success. Because of the rapid pace of scientific change in the field of diabetes, state programs are encouraged to establish minimal requirements for staff training and development. Staff should receive ongoing training in the latest developments in health systems change strategies, community interventions, health communications, the pathophysiology of diabetes, team building, and diabetes surveillance and evaluation. The following is a list of just some of the organizations that offer multidisciplinary diabetes professional training:

The *American Diabetes Association* sponsors numerous courses for health professionals throughout the year.

Web site: www.diabetes.org/

CDC's *Division of Diabetes Translation* sponsors an annual conference and provides numerous professional development resources.

Web site: www.cdc.gov./diabetes

Wichita State University's Division of Continuing Education, Wichita, KS, offers Diabetes Education Update, a didactic workshop addressing clinical, educational, and psychosocial issues.

Web site: webs.wichita.edu/continuinged/deu_form.htm for course curriculum and registration information.

The *International Diabetes Center, Minneapolis, MN,* offers concise diabetes update courses for health professionals.

Web site: www.parknicollet.com/diabetes/professionals/index.html

The *National Diabetes Education Program (NDEP)* offers electronic professional educational materials through a portion of its Web site.

Web site: www.ndep.nih.gov/

NIH's *National Institute of Diabetes, Digestive, and Kidney Diseases,* offers professional education materials through the NIH Information Clearinghouse.

Web site: www.niddk.nih.gov/

The *American Association of Diabetes Educators* offers certification for diabetes educators and sponsors courses for diabetes educators and health professionals.

Web site: www.aadenet.org/index2.html

Funding

CDC's National Diabetes Control Program provides funding for diabetes control programs in all states, the District of Columbia, and eight U.S. jurisdictions. Program funding ranges from $60,000 to $900,000, within two levels of funding. The average award for the 16 states funded at the basic implementation level in 2002 was $798,313. However, states would, on average, need an estimated 10 times the current level of funding to achieve secondary and tertiary diabetes prevention and control goals.[22] Estimates of the cost of primary prevention activities are not available.

Funding poses a major challenge as state programs strive to achieve the diabetes prevention and control goals of *Healthy People 2010*. CDC requires a state match (1:4 or 1:5) of federal resources. However, because fewer than eight states have been able to meet this match with actual dollars, complementary funds from nongovernmental sources are badly needed. The ability to secure additional funding requires strong advocates, well-evaluated and competently led programs, and a clearly articulated response to the diabetes problem in the state.

Diabetes Program Examples

These examples of state program strategies, collaborations, and methods have been collected from state diabetes programs across the country. These examples represent specific aspects of a single program and are not a description of the state program's total effort. In each example, the type of strategy and contact information are provided.

Diabetes Today

Diabetes Today (DT) is a CDC-sponsored course that is offered around the country and in the Pacific Basin to train public health professionals and members of the community in approaches to mobilizing communities to address diabetes. Using community participation and leadership to identify and address community-level diabetes issues is a goal of this "train the trainer" course, which is offered in English, Spanish, and other languages. The DT course offers tools, processes, and methods for developing community-focused programs that are geographically appropriate and culturally relevant. Additionally, DT training promotes collaboration among community residents, health professionals, and health systems. As a result of DT training, participants from many communities whose residents are at high risk for diabetes have identified the need for more community support groups and diabetes education classes. In Laredo, Texas, for example, the Lado A Lado (Laredoans Against Diabetes and Overweight) community program now offers support groups for adults with diabetes. Several counties in Virginia are working to establish diabetes education programs in accessible settings, such as local schools, hospitals, community health clinics, and churches. A DT program in Guadalupe, Arizona, trains lay health workers ("promotoras") to conduct health promotion programs for people with diabetes and those at high risk of developing diabetes.

Type of Strategy: Community intervention

Contact Information:
Division of Diabetes Translation
National Center for Chronic Disease Prevention and Health Promotion

Centers for Disease Control and Prevention
4770 Buford Highway NE, Mail Stop K-10
Atlanta, GA 30341-3717
Phone: 770-488-5000
Fax: 770-488-5966
Web site: www.diabetestodayntc.org

Project DIRECT

Project DIRECT, a comprehensive, community-based intervention carried out in a predominantly black and low-income community in North Carolina, is sponsored by the state health department and CDC. This project began in 1992 with the formation of a partnership among local community stakeholders, who became key decision makers in all that followed. The project established a multilevel, community-based model that includes diabetes care (providing clinical services), outreach (improving community capacity to identify and treat patients with diabetes), and health promotion (reducing risk factors associated with diabetes through information sharing and environmental and policy changes). This project promotes the primary, secondary, and tertiary prevention of diabetes. Because Project DIRECT is a pioneer program of its type, its leaders now share the challenges they encountered and the lessons they learned with local, state, and national leaders interested in pursuing this community empowerment approach to diabetes prevention and control elsewhere.[23]

Type of Strategy: Community intervention

Contact Information:
Diabetes Control Program Director
NC Department of Health and Human Services
Diabetes Prevention and Control Unit
1915 Mail Service Center
Raleigh, North Carolina 27699-1915
Phone: 919-715-3131
Fax: 919-733-0488

New York Centers of Excellence

The New York Diabetes Program collaborates with 14 regional community coalitions and 3 university-based Centers of Excellence (State University of New York/Upstate Medical University in Syracuse, Mount Sinai Medical Center/East Harlem in New York City, and Columbia–Presbyterian Hospital/Naomi Berrie in New York City) to improve diabetes care. The Centers of Excellence work with peer review organizations, health centers, hospitals, and community organizations to develop educational initiatives and promote collaboration among health care providers to improve diabetes services and access to care. The centers also develop methods to overcome socioeconomic, cultural, and language barriers to services. In 2 years, the community- and provider-focused interventions sponsored by the Centers of Excellence have reduced hospitalization rates by 35% and decreased lower-extremity amputation rates by 39%.

Type of Strategy: Health systems change/partnerships

Contact Information:
Diabetes Control Program Coordinator
Bureau of Chronic Disease Services
New York State Department of Health
Empire State Plaza Tower, Room 780
Albany, New York 12237-0678
Phone: 518-474-1222
Fax: 518-473-0642

Improving Diabetes Care through Empowerment, Active Collaboration, and Leadership (Project IDEAL)

Project IDEAL is an initiative developed by the Minnesota Diabetes Control Program and Health Partners, a large managed care organization. IDEAL is a systematic, population-based intervention that facilitates diabetes care improvements by identifying the need for changes within primary care clinics and then making these changes happen. During the pilot stage of IDEAL, the frequency of eye exams, foot exams, and microalbumin testing increased

substantially, and these results were replicated in the intervention phase. In 2 years, participants' average A1C values decreased from 9.2% at baseline to 7.7%. Other effects of this intervention include a higher priority for diabetes in managed care and the application of the IDEAL methodology to address asthma, heart disease, hypertension, and other chronic conditions.

Type of Strategy: Health systems change/ partnerships

Contact Information:
Minnesota Diabetes Control Coordinator
Minnesota Department of Health
P.O. Box 64882
St. Paul, Minnesota 55164-0882
Phone: 651-281-9842
Fax: 651-215-8959

The Diabetes Collaborative

The Diabetes Collaborative is an interagency, public-private partnership aimed at improving the quality of health care for secondary and tertiary diabetes prevention in federally funded community health centers. This partnership involves federal, state, and local entities. National partners include HRSA's Bureau of Primary Health Care, CDC's Division of Diabetes Translation, and the Institute for Health Care Improvement. State and local partners include community health centers and state diabetes programs. To date, 40 state programs are participating formally in the collaborative, along with approximately 300 community health centers. Improvement methods include applying the MacColl Institute for Healthcare Innovation's Chronic Care Model[24] and the Institute of Health Improvement's Quality Improvement Model.[25] Common objectives include measuring patients' A1C levels twice per year, at least 90 days apart, and establishing patient self-management goals. Results of the collaborative's efforts to date include a threefold increase (from 20% to 60%) in the percentage of patients who receive A1C testing at the recommended interval.

Type of Strategy: Health systems change/ partnerships

Contact Information:
Division of Diabetes Translation
National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention
4770 Buford Highway NE MS K-10
Atlanta, GA 30341-3717
Phone: 770-488-5000
Fax: 770-488-5966
Email address: diabetes@cdc.gov
Web site: www.cdc.gov/diabetes

Wisconsin Collaborative Diabetes Quality Improvement Project

The Wisconsin Diabetes Control Program developed the Collaborative Diabetes Quality Improvement Project in partnership with the University of Wisconsin Department of Preventive Medicine. The objectives of this project are to facilitate standardized baseline data collection and to identify and address gaps between current practice and the Wisconsin Essential Care Guidelines. Twenty organizations and 18 HMOs from across the state reported on six indicators of diabetes care for approximately 25,000 people with diabetes in Wisconsin. The indicators were number of A1C tests performed, percentage of people with poorly controlled A1C levels, number of lipid profile tests performed, percentage of people with lipids controlled, number of dilated eye exams performed, and number of people screened for kidney disease. In 2000, all participating HMOs had improved in the six selected indicators since 1999: the proportion of people receiving lipid profiles increased by 10%, the proportion receiving dilated eye exams increased by 8%, and the proportion receiving one or more A1C tests increased by 2%. In addition, control of A1C improved by 4%, control of lipid levels improved by 16%, and screening for kidney disease increased 13%. Two factors critical to the success of this project were that all of the participants, including participating HMOs, were involved in developing the guidelines, and that

information was shared with all participants, many of whom were market competitors. These factors facilitated better coordination of diabetes care, which helped to improve the clinical indicators listed above.

Type of Strategy: Health systems change/ partnerships

Contact Information:
Diabetes Control Program Coordinator
Wisconsin Department of Health
1 West Wilson Street
Room 218
Madison, Wisconsin 53701-2659
Phone: 608-261-6871
Fax: 608-266-8925

The Michigan Diabetes Outreach Network (DON)

The Michigan DON consists of a series of regional networks designed to facilitate comprehensive diabetes assessment, education, referral, and follow-up care through innovative partnerships. Through the coordinated efforts of health departments, private home-care agencies, hospitals, clinics, physicians, and Native American health agencies, people who have diabetes are identified and provided individualized care. As a result of these efforts, most people enrolled in this system have been referred to and have seen all of the recommended health care providers. Furthermore, many of the participants have improved their self-care practices and are now able to self-manage their diabetes. The effectiveness of the DON model was established in 1991, when a published analysis showed that, in just 5 years, the DON serving the Upper Peninsula had reduced the diabetes-related death rate by 27%, the diabetes-related hospitalization rate by 45%, and the diabetes-related lower-extremity amputation rate by 31%. The DON model is the cornerstone of the Michigan Diabetes Control Program and an integral part of quality diabetes care efforts throughout the state.

Type of Strategy: Health systems change/ partnerships

Contact Information:
Diabetes Control Program Coordinator
Diabetes, Dementia, Kidney Section
Michigan Department of Community Health
P.O. Box 30195
Lansing, Michigan 48909
Phone: 517-335-8445
Fax: 517-335-9461
MDON Web site: www.diabetes-midon.org

Utah Statewide Communication Campaign

The goals of this campaign are to improve awareness of diabetes risk factors and screening methods, especially among groups at high risk, and to improve awareness of the most effective ways to control diabetes. The process for developing the campaign included the following:

- Updating the social marketing plan.
- Gathering and analyzing market research on media habits and appropriate messages for target population groups, including Hispanics, Polynesians, and seniors.
- Developing messages and choosing media channels and vehicles appropriate for the target population with diabetes. Decisions were based on market research and a review of materials previously developed by the Utah Diabetes Control Program (UDCP) and the National Diabetes Education Program (NDEP).
- Testing all messages and materials and distributing them.
- Airing NDEP/UDCP television and radio public service announcements, distributing news releases, and developing news stories.
- Developing other promotional items that list the UDCP Web page address and health resource line toll-free number and sending these materials to community partners to distribute to the public.
- Collaborating with local health departments and other community partners to implement public awareness and education activities in their districts.
- Providing materials and training to help health resource line telephone operators respond proficiently to diabetes-related calls and make appropriate referrals.

- Updating and distributing the *Diabetes Resource Manual* (for professionals) and the *Diabetes Directory* (for consumers).
- Maintaining the program's Web page and adding frequently asked questions and questions for patients to ask their doctor.

Evaluation efforts to date have been limited to process evaluation. Utah will conduct an overall diabetes awareness campaign evaluation as well as the Utahns with Diabetes Follow-Up Survey. This communications campaign is only one component of Utah's Diabetes Control Program. Together, the health communications, health systems, and community interventions should help reduce the burden of diabetes in the state.

Type of Strategy: Health communications

Contact Information:
Diabetes Control Program Coordinator
Utah Department of Health
Chronic Disease Control
Division of Community and Family Health Services
288 North 1460 West
P.O. Box 142107
Salt Lake City, Utah 84114-2107
Phone: 801-538-6141
Fax: 801-538-9495
Web site: www.health.utah.gov/diabetes

West Virginia Statewide Diabetes Media Campaign

The West Virginia Diabetes Program implemented a media campaign from September 1999 through July 2002 to improve the preventive health care practices of Medicare beneficiaries with diabetes. The campaign featured rotating messages about A1C testing, eye examinations, influenza immunizations, and other diabetes prevention and diabetes care topics. Evaluation of this effort focused on determining whether Medicare beneficiaries with diabetes saw or heard mass media messages about diabetes and whether hearing messages was associated with a self-reported response. The telephone survey was of a random sample of 1,500 beneficiaries in the West Virginia Diabetes Database from two groups of counties: those with high and those with low exposure to the media campaign as determined from broadcast logs and station coverage maps. The survey asked whether the beneficiary had heard and responded to messages on specified topics.

Beneficiaries who had had high exposure to the messages were about 1.2 times more likely to recall hearing messages on A1C, foot examinations, and influenza immunizations than were beneficiaries with low exposure, and this difference was statistically significant ($p<0.05$). Furthermore, for all four message topics, having heard the messages was significantly associated with the likelihood of self-reported action (e.g., talking to a doctor about A1C testing).

Type of Strategy: Health communications

Contact Information:
Peggy Adams, RNC, MSN, CDE
Diabetes Control Program
Department of Health and Human Resources
350 Capitol St., Room 319
Charleston, West Virginia 25301
Phone: 304-558-0644
Fax: 304-558-1553

Challenges Ahead

Diabetes is an enormous public health problem. However, by continuing to learn more about diabetes and by doing all that is possible to prevent and control this disease, Americans may ultimately succeed in reducing the great burden it creates. Although a greater proportion of public health resources will likely be devoted to primary prevention in the years to come, secondary and tertiary prevention will remain important public health opportunities for reducing the incidence and severity of diabetes complications among people who already have the disease. Moreover, while exercise and physical activity can reduce people's risk for type 2 diabetes, particularly among those with elevated fasting glucose levels and impaired glucose tolerance, translating this knowledge into effective public health actions will not be easy. To provide tangible

evidence of the impact of specific interventions, public health diabetes programs must have a strong evaluation component, and to establish priorities in accordance with scientific evidence, they must be able to respond rapidly to lessons learned.

Technical Resources

The following Web sites provide valuable technical resources for state and local diabetes control programs.

Federal

Centers for Disease Control and Prevention.
www.cdc.gov/diabetes. Provides diabetes statistics, programs, and publications information.

CDC link to Web sites of state diabetes control programs.
www.cdc.gov/diabetes/states/index.htm.

National Diabetes Education Program (NDEP).
www.ndep.nih.gov. Provides information on diabetes resources and tools and on NDEP campaigns.

National Institutes of Health.
www.niddk.nih.gov. Provides information on diabetes research and clinical trial.

U.S. Department of Health and Human Services (HHS) Office of Minority Health.
www.omhrc.gov. Provides information on HHS efforts to address racial and ethnic health disparities.

Healthy People 2010.
www.health.gov/healthypeople/about. Provides information about *Healthy People 2010*. See chapter 5 for information on diabetes.

Health Resources and Services Administration.
www.hrsa.gov. Provides information on programs, resources, and funding.

Nongovernmental Organizations

American Association of Diabetes Educators. www.aadenet.org.

American Diabetes Association. www.diabetes.org.

Juvenile Diabetes Research Foundation. International. www.jdrf.org.

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Achieving a Heart-Healthy and Stroke-Free Nation

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Achieving a Heart-Healthy and Stroke-Free Nation

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A National Approach for State Heart Disease and Stroke Prevention Programs

Before 1998, public health organizations, especially state health departments, had few resources to comprehensively address heart disease and stroke, even though they are the nation's first and third leading causes of death. In 1998, the U.S. Congress provided funding for the Centers for Disease Control and Prevention (CDC) to initiate a national, state-based heart disease and stroke prevention program. As funding allows, the CDC strategic plan calls for establishing a comprehensive national heart disease and stroke prevention program that supports state-based programs in all states and territories. In 2002, the CDC's Heart Disease and Stroke Prevention Program funded 29 states and the District of Columbia to address heart disease and stroke.

The goals of the national Heart Disease and Stroke Prevention Program are to

- Develop and enhance national and state partnerships and public health capacity to improve cardiovascular health (CVH) and prevent and control cardiovascular disease (CVD).
- Delay the age of onset of heart disease and stroke and associated morbidity and disability.
- Translate prevention science into strategies and practices.
- Define and conduct public health research and evaluation.
- Monitor changes in heart disease and stroke risk factors, program outcomes, and policy and environmental indicators.
- Maximize resources through collaboration with partners.

CDC plays a national leadership role in promoting heart health and reducing the burden of heart disease and stroke. This leadership involves collaborating with many sectors—local, state, and federal governments; community and volunteer organizations; academic institutions; faith-based organizations; schools; work sites; health care settings; and the media—to achieve the vision of a heart-healthy and stroke-free nation.

The Burden of Heart Disease and Stroke in the United States

Magnitude

Heart disease and stroke are the principal components of cardiovascular disease, the leading cause of death and disability among adults in the United States.[1] As the burden of heart disease and stroke continues to grow, CVD is projected to be the number one cause of death worldwide by the year 2020. In 1999, the overall worldwide death rate for CVD was 354.1 per 100,000 people: 303.2 per 100,000 women and 418.2 per 100,000 men.[2] In the United States, CVD affects 61.8 million Americans and claims nearly one million lives annually. More than one in five people has some form of CVD,[1] which affects people of all racial/ethnic groups and ages. Although CVD death rates decreased in the 1980s and 1990s, the actual numbers of CVD-related deaths increased because of increases in the number of older Americans. In addition, the rate of decline in deaths from heart disease and stroke has slowed significantly in recent years. Meanwhile, hospitalizations for heart failure have increased steadily since 1975.[3, 4]

In the United States, 1.1 million heart attacks occur each year, and coronary heart disease causes more than 515,000 deaths, or about one death every minute. Almost half (250,000) of those who die of coronary heart disease do not live to reach the hospital. Of those who have a heart attack, 25% of men and 38% of women will die within a year despite medical and surgical interventions. Those who survive longer are at high risk for a recurrent heart attack and death and may have significant discomfort and disability. Almost 150,000 of those who die of CVD each year are younger than age 65, and sudden or unexpected cardiac deaths among young adults have increased in recent years.[1] Heart failure is diagnosed for the first time in approximately 550,000 Americans each year, and more than 51,000 deaths annually are due to this condition.

In addition, the 700,000 strokes that occur each year cause more than 167,000 deaths, or approximately 1 death every 3 minutes. Among survivors, 15%–30% are permanently disabled.[1]

These CVD events and conditions are manifestations of atherosclerosis, a disease process that often begins in childhood and adolescence. The major risk factors for atherosclerosis and its complications are high total cholesterol and high blood pressure. Diabetes also increases a person's risk for CVD. These risks arise from dietary imbalance (such as excessive intake of animal fats and calories), physical inactivity, and use of tobacco products. These underlying behavioral risks and their health consequences are rooted in social and environmental conditions that foster unhealthy lifestyle choices. Therefore, population-based approaches addressing policy and environmental change must be a major focus of a successful national public health approach.

Disparities

In 2000, CVD was the leading cause of death among both women and men in the United States. CVD causes more deaths among women than among men, in part because of the greater number of older women in the population. African Americans are at substantially higher risk for death from CVD than are whites. This difference is attributable in part to a greater risk for strokes and a higher prevalence of high blood pressure among African Americans. For every 100,000 people, the rate of death from CVD was 509.6 for African American men, 397.6 for white men, 397.1 for African American women, and 285.8 for white women. The rate of death due to high blood pressure per 100,000 people was 46.3 for African American men, 13.2 for white men, 40.8 for African American women, and 13.1 for white women.[1]

Data indicate substantial disparities in risk factors for CVD among racial and ethnic groups in the United States (Table 1).[1] Risk behaviors and risk factors such as obesity and diabetes are more prevalent among African Americans and Mexican Americans than among non-Hispanic whites. For example, physical inactivity is higher among Mexican American women (57%) and non-Hispanic African American women (57%) than among non-Hispanic white women (39%). These disparities undoubtedly contribute to the substantially greater burden of CVD among these two population groups.

Costs

The estimated cost of CVD to the nation is expected to exceed $351 billion in 2003.[1] The direct costs for health care are projected to be $209.3 billion, while lost productivity accounts for an additional $142.5 billion. One-quarter of the lost productivity amount is due to disability that results in unemployment, and three-quarters is due to premature death (death before age 65).

These sobering figures can only be expected to increase unless effective programs and policies are implemented nationwide to reduce the burden of CVD. Future cost increases will be created in part by the aging of the population and by the growth of ethnic minority populations at high risk for CVD.[3] Advances in medical technology also can be expected to increase the cost of services for each CVD event. In addition to these financial costs, CVD creates social costs to families and communities that cannot be calculated.

Table 1. Prevalence of Risk Factors for CVD in the United States, by Race/Ethnicity and Gender, American Heart Association, 2003

Risk Factors and Conditions	Race/Ethnicity and Gender					
	Non-Hispanic Whites		African Americans		Mexican-Americans	
	Males	Females	Males	Females	Males	Females
High blood pressure[a]	25.2	20.5	36.7	36.6	24.2	22.4
High LDL-cholesterol[b]	49.6	43.7	46.3	41.6	43.6	41.6
Smoking[c]	25.8	21.6	26.1	20.8	24.1	12.3
Physical Inactivity[d]	32.5	36.2	44.1	55.2	48.9	57.4
Obesity[e]	27.3	30.1	28.1	49.7	28.9	39.7
Diabetes[f]	5.4	4.7	7.6	9.5	8.1	11.4

[a] Systolic blood pressure ≥140 mm Hg, diastolic blood pressure ≥90 mm Hg, or on anti-hypertensive medication: age adjusted for people aged 20 and older.
[b] LDL-cholesterol ≥130 mg/dL: age adjusted for people aged 20 and older.
[c] Among people aged 18 years and older.
[d] No leisure time activity among people aged 18 years and older.
[e] Body mass index ≥30 kg/m^2 among people aged 20 and older.
[f] Physician-diagnosed diabetes: age adjusted for people aged 20 and older.
Source: *Heart and Stroke Statistics—2003 Update*.[1]

If all major forms of CVD were eliminated, life expectancy would be extended by almost 7 years.[1] In addition, Americans' quality of life would be greatly improved, and health care costs and dependency would be substantially reduced.

Healthy People 2010: Heart Disease and Stroke

National health goals and objectives for the current decade are published in *Healthy People 2010* and include those for heart disease and stroke in Chapter 12.[5] CDC and the National Institutes of Health are co-leads for goals for heart disease and stroke. The universal goals of *Healthy People 2010* are to improve the quality and increase the duration of people's lives and to eliminate disparities. The one goal specific to preventing heart disease and stroke has three components:

- Prevention, detection, and treatment of risk factors.
- Early identification and treatment of heart attacks and strokes.
- Prevention of recurrent cardiovascular events.

The following 16 objectives from chapter 12 of *Healthy People 2010* address heart disease, congestive heart failure, stroke, high blood pressure, and high total blood cholesterol levels. Fortunately, because most cardiovascular disease is preventable, much can be done to lessen the burden of heart disease and stroke and meet *Healthy People 2010* objectives.

12.1 Reduce coronary heart disease deaths.
Baseline: 208 deaths per 100,000 in 1998 (age-standardized to 2000).
Target: 166 deaths per 100,000; 20% improvement.

12.2 (Developmental) Increase the proportion of adults aged 20 years and older who are aware of the early warning symptoms and signs of a heart attack and the importance of accessing rapid emergency care by calling 911.

12.3 (Developmental) Increase the proportion of eligible patients with heart attacks who receive artery-opening therapy within an hour of symptom onset.

12.4 (Developmental) Increase the proportion of adults aged 20 years and older who call 911 and administer cardiopulmonary resuscitation (CPR) when they witness an out-of-hospital cardiac arrest.

12.5 (Developmental) Increase the proportion of persons with witnessed out-of-hospital cardiac arrest who are eligible and receive their first therapeutic electrical shock within 6 minutes after collapse recognition.

12.6 Reduce hospitalizations of older adults with heart failure as the principal diagnosis.
For people aged 65–74 years: 1997 baseline, 13.4/1,000; target, 6.5/1,000.
For people aged 75–84 years: 1997 baseline, 26.9/1,000; target, 13.5/1,000.
For people aged 85 years and older: 1997 baseline, 53.1/1,000; target, 26.5/1,000.

12.7 Reduce stroke deaths.
Baseline: 60 deaths per 100,000 in 1998 (age-standardized to 2000).
Target: 48 deaths per 100,000; 20% improvement.

12.8 (Developmental) Increase the proportion of adults who are aware of the early warning symptoms and signs of a stroke.

12.9 Reduce the proportion of adults with high blood pressure.
Baseline: 28% of adults aged 20 years and older in 1988–1994 (age-standardized to 2000).
Target: 16%.

12.10 Increase the proportion of adults with high blood pressure whose blood pressure is under control.
Baseline: 18% of adults aged 18 and older with high blood pressure had it under control in 1988–1994 (age-standardized to 2000).
Target: 50%.

12.11 Increase the proportion of adults with high blood pressure who are taking action (for example, losing weight, increasing physical activity, and reducing sodium intake) to help control their blood pressure.
Baseline: 72% of adults aged 18 and older with high blood pressure were taking action to control it in 1998 (age-standardized to 2000).
Target: 95%.

12.12 Increase the proportion of adults who have had their blood pressure measured within the preceding 2 years and can state whether their blood pressure was high or normal.
Baseline: 90% of adults aged 18 and older (age-standardized to 2000).
Target: 95%.

12.13 Reduce the mean total blood cholesterol levels among adults.
Baseline: mean 206 mg/dL among adults aged 20 years and older in 1988–1994 (age-standardized to 2000).
Target: 199 mg/dL.

12.14 Reduce the proportion of adults with high total blood cholesterol levels.
Baseline: 21% of adults aged 20 years and older with total blood cholesterol levels ≥240 mg/dL in 1988–1994 (age-standardized to 2000).
Target: 17%.

12.15 Increase the proportion of adults who have had their blood cholesterol checked within the preceding 5 years.

Baseline: 68% of adults aged 18 and older (age-standardized to 2000).
Target: 80%.

12.16 (Developmental) Increase the proportion of persons with coronary heart disease who have their LDL-cholesterol level treated.

Other objectives relevant to heart disease and stroke can be found in *Healthy People 2010* chapters addressing chronic kidney disease, tobacco use, access to quality health services, nutrition and overweight, physical activity and fitness, and public health infrastructure. This broad spectrum of goals and objectives represents a wide range of opportunities for prevention programs.

Public Health Opportunities

Health Promotion and Primary and Secondary Prevention

Preventive strategies, the traditional focus of public health programs, should include overall *health promotion* as well as *primary* and *secondary prevention*.

Health promotion targets the general population. This strategy enables people to gain control over the behaviors and conditions that affect their health status. Educational campaigns to increase public awareness of the signs and symptoms of heart attack and stroke, policy changes to ensure universal 9-1-1 coverage, and policy and environmental changes that support heart-healthy behaviors in the general population are examples of health promotion strategies.

Primary prevention targets people who are at increased risk for a first CVD event because they have one or more CVD risk factors. Guidelines from the American Heart Association (AHA) and other national organizations advocate for primary prevention of CVD by addressing the risk factors of high blood pressure, high cholesterol, tobacco use, poor nutrition, physical inactivity, overweight and obesity, and diabetes.

Secondary prevention targets populations with established CVD to prevent recurrent events. These strategies include ensuring compliance with guidelines on the use of aspirin, beta-blockers, ACE inhibitors, anticoagulants, and other antiplatelet agents. In addition, reducing risk factors through lifestyle changes such as losing weight and quitting smoking is an important strategy for secondary as well as primary prevention.

Although other classification systems may include tertiary prevention, our program groups this prevention level with secondary prevention.

Essential Strategies: The Socioecological Approach

Because of the complexity of the CVD burden, comprehensive programs are needed to reduce CVD rates, eliminate disparities, and achieve the long-term goals of *Healthy People 2010*. Key components of a state heart disease and stroke prevention program include the following:

- Promotion of CVH to prevent the development of risk factors (e.g., high blood pressure, high cholesterol, tobacco use, physical inactivity, and poor nutrition) and conditions (e.g., diabetes and obesity).
- Primary prevention of heart disease and stroke.
- Secondary prevention of heart disease and stroke.
- Elimination of health disparities for heart disease and stroke.
- Heart-healthy policies and supportive environmental changes.
- Programs in multiple settings: health care, work sites, schools, and communities.

Research and experience indicate that health is connected to both the physical and social environment. Individual behaviors are supported and reinforced in numerous ways by legislation, regulations, organizational policies, social norms, and environments. For this reason, a comprehensive and integrated approach to promoting CVH and addressing CVD requires not only education and increased awareness, but also a major emphasis on environmental and policy change at multiple levels of society. Changes in policy and the social and physical environment are necessary to foster and maintain individual-level behavior change; for example, restricting young people's access to tobacco products will reduce the likelihood that they will use tobacco.[6] Approaches

should address policy and environmental change in multiple settings (e.g., health care, work sites, schools, communities) to reach people throughout their lives with a variety of messages and interventions. The primary roles of state heart disease and stroke prevention programs are to provide public and professional education and training and to facilitate policy and environmental changes. In addition, state heart disease and stroke prevention programs should work with partners to ensure that they provide appropriate interventions for behavior change among individuals.

Policy and environmental approaches are part of three core functions of public health: assessment, policy development, and assurance. According to a 2001 Institute of Medicine report, "An understanding of the social factors influencing behavior is growing and should be considered in programs and policies for public health. Many social, economic, political, and cultural factors are associated with health and disease for which changes in individual health behaviors alone are not likely to result in improved health and quality of life...The law can change the informational, physical, social, or economic environment to facilitate healthier behavior."[7] The report states that "program planners and policy makers need to consider modifying social and societal conditions to enable healthy behavior. Use of population-based policy and environmental strategies shifts public health from a direct service role to one that focuses on guidance, agenda setting, and coordination of CVH improvement efforts."[7]

The socioecological approach is the basis for CDC's logic model for state heart disease and stroke prevention programs (Figure 1). The model depicts relationships between actions (e.g., links between environmental and policy changes and individual-level behavioral change) that are necessary to reduce rates of CVD. Because logic models are often cyclical, an outcome from one activity can provide information that then feeds back into a previous activity. State activities involve building capacity, conducting surveillance, and developing/establishing interventions. These activities influence changes that lead to short-term outcomes such as the development of a CVH state plan, new strategies for system-level changes, and more effective implementation of interventions. These activities and outcomes result in changes in policy and environmental supports, changes in people's behavior, and eventually improvements in their health.

The state program logic model describes the program and is a tool to guide program evaluation. By identifying the steps necessary to reach intended outcomes, the logic model indicates where emphasis should be placed in evaluating the process and outcomes of the program. More guidance is provided in the *Evaluation Framework for the State Heart Disease and Stroke Prevention Programs* and the *State Heart Disease and Stroke Prevention Programs: Evaluation Concepts* (available from the CDC Heart Disease and Stroke Prevention Program).

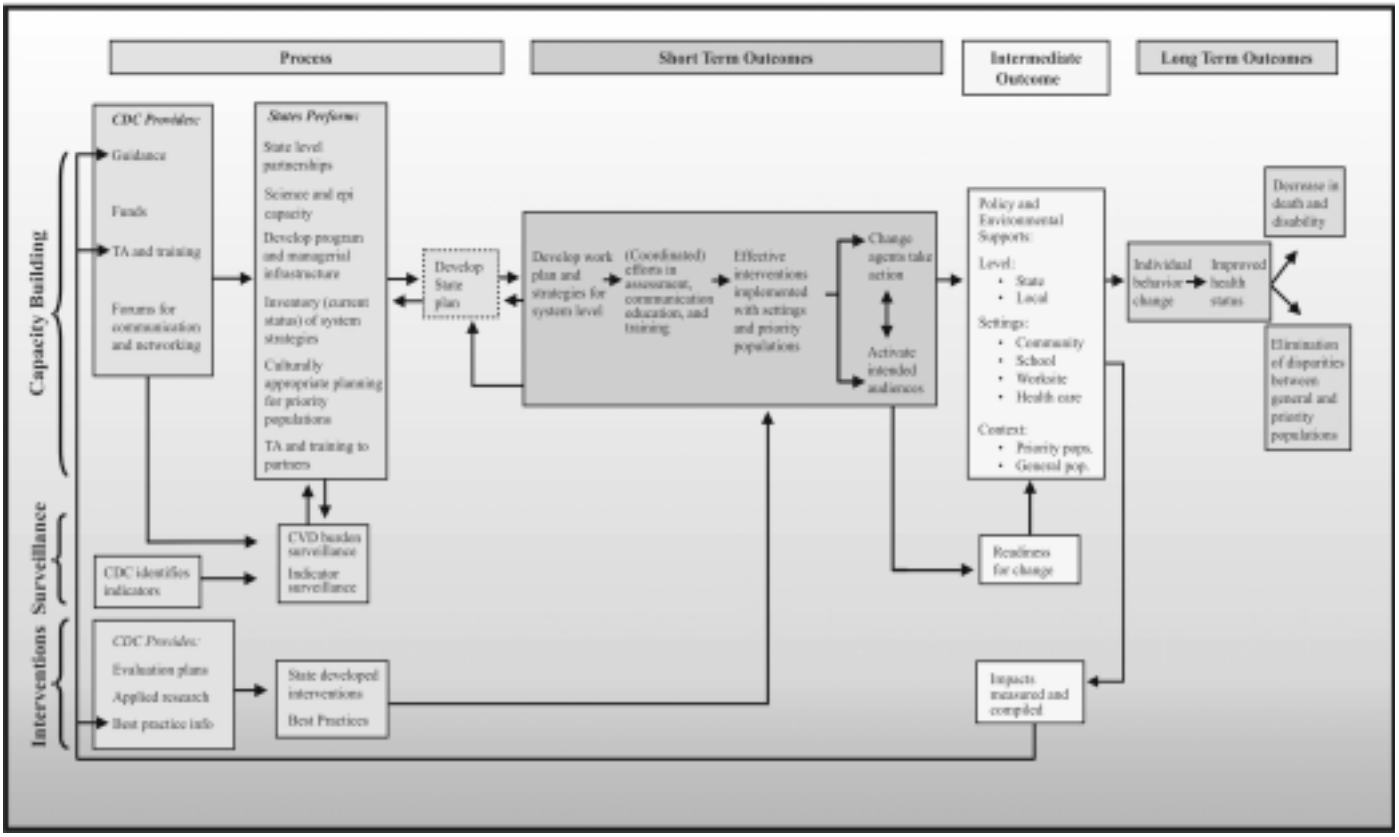
Interventions

State heart disease and stroke prevention program interventions should address the population as a whole while giving special attention to priority populations (e.g., populations that the state determines to be priority for CVH interventions on the basis of such factors as rates of cardiovascular disease and related risk factors, lack of access to services, and socioeconomic levels). Interventions should

- Be culturally appropriate.
- Use population-based strategies such as environmental and policy changes.
- Increase education on and awareness of heart disease and stroke issues among the public, decision makers, and health care professionals.
- Monitor primary and secondary prevention services to ensure the provision of quality care.

Programs should emphasize interventions at the state level and in various settings (e.g., health care, work sites, schools, community) in which policy or environmental changes can produce substantial

Figure 1. Logic Model for State Heart Disease and Stroke Prevention Programs



health benefits. However, they should focus their efforts at the highest level possible; for example, activities should focus on business coalitions and unions rather than individual work sites and on managed care organizations and state medical associations rather than on individual health care settings or physicians.

Population-based approaches can be disseminated through various settings and groups. Policy and environmental changes and education should be used to make each setting more supportive of heart-healthy choices and ensure that it provides appropriate CVH promotion and CVD prevention and control services. Settings in which policy and environmental changes might be instituted include the following:

- State-level and government settings (e.g., creating smoke-free environments in state buildings, requiring health care coverage that reimburses for primary and secondary prevention services related to CVD, providing high blood pressure medication to people on limited incomes, establishing statewide 9-1-1 coverage, requiring training [e.g., protocols for working with stroke patients for emergency medical staff], and accrediting food services).
- Health care settings (e.g., implementing primary and secondary prevention guidelines for heart disease and stroke to ensure quality of care).
- Work sites (e.g., providing blood pressure screening and monitoring, having staff trained on use of CPR and AEDs, providing time for and access to physical activities, establishing clean indoor air policies, and offering heart-healthy food options in cafeterias and vending machines).
- Schools (e.g., educating students about healthy lifestyle choices, heart disease and stroke, and CPR; providing heart-healthy school food choices; and requiring schools to be tobacco-free).

- Communities (e.g., providing blood pressure screening at all fire stations, ensuring 9-1-1 coverage, building parks).

In addition, the media can be used to increase public awareness of the importance of CVH, the risk factors for CVD, and the need for policy and environmental changes. The media can also be instrumental in educating the public about the signs and symptoms of heart attack and stroke and when to call 9-1-1.

Key partners for implementing these activities should include the American Heart Association (AHA), state quality improvement organizations (QIOs), and private health care providers and hospitals. The state heart disease and stroke prevention program should partner with its QIO to monitor secondary prevention practices (e.g., aspirin and drug therapy, physical activity regimens, and hypertension and lipid management) and to help improve compliance with secondary prevention guidelines. In collaboration with partners, it should also promote professional education and policy changes that support efforts to implement the guidelines on primary and secondary prevention. Providing blood pressure and cholesterol screenings is not appropriate for the state heart disease and stroke prevention program itself. However, the state program should encourage partners to provide these services and ensure that health care staff are trained in accurately measuring blood pressure and in applying quality assurance standards.

Interventions should be coordinated with internal and external partners to ensure that health messages, policies, and environmental measures are consistent, effective, synergistic, and not redundant. Further research is needed on how to best implement intervention strategies in different settings and with different populations.

For further discussion of effective interventions to address heart disease and stroke, please refer to related chapters in this document, including those on tobacco, school health, nutrition, physical activity, and diabetes.

State Examples:

- The *Tri-State Stroke Network*, which includes representatives of the Georgia, South Carolina, and North Carolina CVH programs, works to increase public awareness of stroke symptoms and the need to treat stroke as a medical emergency. One of the main objectives of the network is to promote the development and implementation of stroke prevention and control programs in the Tri-State area.
  Program contact: Tynetta Brown, Cardiovascular Health Program, North Carolina Division of Public Health/DHHS.
- The *Missouri CVH Program* has partnered with the state Diabetes Prevention and Control Program (DPCP) to establish a diabetes/CVD collaborative to improve the care that federally qualified health centers provide to people with these conditions. The collaborative focuses on system changes (e.g., in delivery system design, decision support, clinical information systems, and self-management support) in these health centers. In addition, the CVH Program and the DPCP have supported the statewide establishment of the American Diabetes Association's "ABC Campaign," which focuses on managing clinical factors related to diabetes and CVD, including blood pressure and cholesterol levels.
  Program contact: Diana Hawkins, Cardiovascular Health Program, Missouri Department of Health.
- The *New York Healthy Heart Program* assesses supports for CVH in work sites with a high need and high readiness for change and with a preponderance of low-income employees. Heart-healthy policies and environments are assessed using a tool (Heart Check) developed by the program. Following an initial 3-year intervention, a reassessment with Heart Check indicated that participating work sites had increased policy and environmental supports for heart health by 65%. Many of these work sites now are making blood pressure screening available, offering low-fat food choices in vending machines, instituting smoke-

free policies, and providing physical activity breaks during the workday.[8]
Program contact: Margaret Casey, Healthy Heart Program, New York Department of Health.

- The *North Carolina CVH Program* collaborates on the BASIC Preventive Benefits Initiative with North Carolina Prevention Partners, which includes a variety of health plans and employers, the state QIO, and various HHS programs. 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. The initiative aims to increase the quality of care received by consumers and to improve the health status of individuals and populations. From 1998 through 2002, the initiative has led to a 75% increase in the number of health plans offering tobacco, nutrition, and physical activity insurance products to employer groups.
Program contact: Libby Puckett, Cardiovascular Health Program, North Carolina Division of Public Health/DHHS.
- The *Wisconsin CVH Program* is collaborating with its state QIO and DPCP to collect Health Plan Employer Data and Information Set (HEDIS) indicators for diabetes, cholesterol, and high blood pressure. These indicators will enable the program to work with participating health care providers to implement system enhancements to improve these CVD-related measures.
Program contact: Mary Jo Brink, Cardiovascular Health Program, Wisconsin Division of Public Health.

Infrastructure to Support State Heart Disease and Stroke Prevention Programs

Program Management and Administration

A strong system of management, staff, and support are necessary to effectively address CVH at the state level. A state heart disease and stroke prevention program in a state health department should have staff who are able to

- Provide leadership for overall program development, program coordination, and implementation.
- Use a variety of data to assess the burden of CVD, CVD-related disability, and risk factors, and interpret data for program planning.
- Frame public health issues for policy makers and apply policy and environmental strategies to improve CVH.
- Develop and maintain partnerships.
- Carry out health communications, health education, training, advocacy, and media activities.
- Provide appropriate support to community-based intervention programs in a variety of settings and work with diverse populations.
- Develop and analyze health policy.
- Provide policy and administrative support for CVH program activities.
- Ensure that programs are implemented with integrity and evaluated for effectiveness.

Qualified personnel at the state, regional, and local levels are critical to implementing and managing a comprehensive heart disease and stroke prevention program. The program manager should have the skills to collaborate with internal and external programs and organizations and to facilitate program planning and development. The CVH staff should include a chronic disease epidemiologist, who can access and analyze a variety of data sets to define and document the burden of CVD. CDC recommends that the core staff also include from 6 to 15 additional people in such positions as policy analyst, health educator, program evaluator, secondary prevention specialist, statistician, and health communication specialist to address strategic planning, policy and environmental approaches, communication, priority populations, and population-based interventions. States may want some of these positions at a district or regional level. CVH staff also need skills for working in multiple settings and with a variety of partners, including the state department of education, public safety, and emergency medical services; academic institutions; managed care organizations; federally qualified health centers; and voluntary health agencies such as the AHA.

State health department structure and management should encourage collaboration between the state heart disease and stroke prevention program and related programs such as coordinated school health, diabetes, tobacco control, physical activity, and nutrition.

Surveillance and Evaluation

The burden of CVD in the state should be well defined. To assess that burden, the state health department needs capacity in the areas of chronic disease epidemiology, statistics, surveillance, data analysis, and the application of data in program planning and priority setting. State staff should be able to use data to support allocating resources to CVH prevention.

Staff should have access to data systems such as vital statistics, the Behavioral Risk Factor Surveillance System (BRFSS), the Youth Risk Behavior Survey, hospital discharge data, HEDIS, Medicaid and Medicare data, and other data sources that are useful for defining the burden of CVD in the state. In addition, state heart disease and stroke prevention program staff should be able to use data from geographic information systems to document the distribution of CVD, delineate disparities, and specify the needs of priority populations. (Geographical data by state and county are available on CDC's Heart Disease and Stroke Prevention Program Web site: www.cdc.gov/cvh.)

The BRFSS modules on hypertension awareness, cholesterol awareness, cardiovascular disease, and heart attack and stroke signs and symptoms should be part of the state BRFSS survey; optional modules and state-added questions should be used to help the state program track trends in CVD and related risk factors. The state BRFSS sample size should be large enough to gather statistically adequate responses for priority populations, including racial and ethnic groups. States should consider surveillance questions as a means for gathering community- and regional-level data for targeted interventions.

Communication strategies should be based on state and local data so that partners and the public understand CVD's relevance to, and impact on, both their personal health and the health of the people in their communities. A published document defining the burden of CVD in the state should communicate data in ways that are appropriate for different audiences, including community groups, state leaders, and decision makers. It should describe the burden of CVD (primarily heart disease and stroke) and related risk factors and conditions (e.g., high blood pressure, high cholesterol, tobacco use, physical inactivity, poor nutrition, diabetes). The document should describe the geographic and demographic distribution of CVD, highlighting disparities in CVD burden based on geography, gender, socioeconomic status, and race and ethnicity. It should also identify trends in CVD, including changes in numbers of deaths, average age at onset of disease, and average age at death.

This burden document should be used as a tool to increase public awareness of CVD as a public health priority, to mobilize partners to address CVD in a comprehensive manner, and to support the commitment of resources to promoting CVH. Data can be presented to staff, partners, community groups, policy makers, and decision makers to enhance their understanding of how to use data for program planning. The data should provide a basis for developing the CVH state plan and for identifying priority populations and strategies.

Program evaluation is essential for planning programs and building the scientific capacity of state health departments. State heart disease and stroke prevention program staff should have a good understanding of methodologies to evaluate process and outcome and should develop and implement an evaluation plan. State health departments should be able to validate and demonstrate the existence of "core capacities," which include committed partnerships; surveillance, assessment, and evaluation functions; the ability to document the burden of

CVD; the ability to develop a comprehensive CVH state plan; training and technical assistance capabilities; and the ability to identify or devise population-based intervention strategies that are culturally competent and address priority populations. Without this basic infrastructure in place, CVH activities may be scattered and lack focus and thus have a limited impact on the cardiovascular health of state residents.

State heart disease and stroke prevention programs should also evaluate short-term, intermediate, and, when possible, long-term outcomes. When designing their evaluation, the state program should use evaluation tools provided by CDC, including the *Evaluation Framework for the State Heart Disease and Stroke Prevention Programs* which describes the overall evaluation component of state programs; the State Program Logic Model, a graphic description of the state heart disease and stroke program (see Figure 1), and the *State Heart Disease and Stroke Prevention Programs: Evaluation Concepts*, which assists states in developing evaluation plans for their individual CVH programs.

State Examples:

- The *Mississippi CVH Program* collaborated with its AHA state affiliate to produce the *2000 Mississippi State of the Heart Report* and the *2000 Mississippi Stroke Report*. These documents contain data on CVD-related illness, death, and risk factors. Data include county-specific mortality rates depicted in county maps, which have a visual impact for local legislators. Strategies to reduce risk behaviors also are listed in the reports. The reports have been shared with members of the Mississippi Chronic Illness Coalition to increase their awareness of the burden of these diseases, provided to legislative study committees to enhance their understanding of the need for policy and environmental supports to reduce CVD, and used by public health staff to guide program planning.
  Program contact: Wanda Magers, Cardiovascular Health Program, Mississippi State Department of Health.
- The *West Virginia CVH Program* produced a burden report in 2001 that includes data on mortality rates, behavioral risk factors, cost, and access to medical care. The report also describes CVH program goals and activities to eliminate health disparities. In March 2002, this report was placed on the West Virginia Department of Health and Human Resources, Bureau of Public Health Web site, where West Virginia risk factor data could be compared with national risk factor data. The report was used to establish the CVH Program's priorities, track changes in data trends, and help the state coalitions implement strategies to achieve CVH goals.
  Program contact: Amy Carte, Cardiovascular Health Program, West Virginia Bureau for Public Health.
- The *Oregon CVH Program* compared the prevalence of major CVD risk factors, including hypertension and high cholesterol levels, among Medicaid-eligible residents with their prevalence among the general population and evaluated associations between these risk factors and Medicaid claims for CVD hospitalization. It found that CVD risk factors are more common among Oregon's Medicaid populations than among the general population and are associated with CVD hospitalizations among the former group. The CVH Program is using this information to identify priority populations and to help set program priorities.
  Program contact: Laura Chenet Leonard, Cardiovascular Health Program, Oregon Department of Human Services.
- The *New York Healthy Heart Program* has developed a reporting system to monitor policy and environmental changes occurring in work sites so that it can evaluate the outcomes of its work site interventions. It is evaluating the Heart Check tool to determine whether the number of questions for the work site assessment can be reduced, thereby increasing ease of use. Pre- and post-Heart Check scores have increased an average of 75%, with improvements in nutrition, physical activity, and administrative support.

Program contact: Margaret O. Casey, Healthy Heart Program, New York State Department of Health.

Partnerships

The multifaceted nature of opportunities for promoting CVH and preventing CVD requires the cooperation and collaboration of many partners in public and private sectors. A key task for partners is to develop a comprehensive CVH state plan and ensure that it is implemented. The involvement of partners should promote the coordination of activities to avoid duplication of effort and to share responsibility for improving CVH. The state health department should secure the involvement of diverse partners and provide leadership.

The state heart disease and stroke prevention program should partner internally with state health department programs that address the following:

- CVD-related risk factors, such as high blood pressure, high cholesterol, tobacco use, physical inactivity, and poor nutrition.
- Related areas, such as diabetes and school health.
- Priority populations.
- Data (e.g., vital statistics, the state's BRFSS).

The state heart disease and stroke prevention program should also form external partnerships with the following types of organizations:

- State agencies that address CVD risk factors, such as the departments of education, public safety, and emergency medical services.
- Organizations whose missions are associated with promoting heart health and reducing heart disease and stroke, such as the AHA.
- Other professional and voluntary organizations interested in improving health and quality of life and eliminating disparities in CVD burden, such as quality improvement organizations, minority health organizations, health care organizations, media, community-based organizations, academic institutions, and businesses.

In addition, the state health department should collaborate with academic institutions and Prevention Research Centers (see www.cdc.gov/prc) to conduct research to improve programs and policies for CVH promotion and CVD prevention; to translate knowledge from social, behavioral, and medical sciences into sound public health practice; and to ensure that program interventions and evaluations are well grounded in science.

State Examples:

- The *Virginia CVH Program* coordinates strategic partnerships through the Healthy Pathways Coalition. The coalition is charged with comprehensively addressing primary and secondary prevention of CVD and promoting CVH. Partners represent private and governmental state-level organizations, including those representing priority populations. The CVH Program has developed a logic model that clarifies relationships among partners, sectors, and program activities. The logic model is being used to guide the coalition's strategic planning and will be in the resulting Call to Action document.
  Program contact: Jody Stones, Cardiovascular Health Program, Virginia Department of Health.
- The *Utah CVH Program's* key state partners form the Alliance for Cardiovascular Health in Utah. The alliance comprises more than 140 organizations representing government, private businesses, health care organizations, and nonprofit agencies. The alliance has developed a 3-year CVH plan (Uniting Partners for a Legacy of Health), which is designed to coordinate efforts among organizations and identify key strategies, with an emphasis on policy and environmental supports.
  Program contact: Joan Ware, Cardiovascular Health Program, Utah Department of Health.

State Plans

State heart disease and stroke prevention programs need a comprehensive plan that identifies their priorities and focuses the efforts of their many partners. The state health department and its diverse

partners should develop and regularly update this plan, which should present strategic objectives that require leadership, ownership, coordination, and commitment of resources by both public- and private-sector partners. It should be a state heart disease and stroke prevention program plan and not a state health department plan. The strategic objectives should include population-specific strategies that address the needs of priority populations and should emphasize policy and environmental approaches, systems changes, and educational interventions that increase support for heart-healthy choices and provide a context for more effective CVD prevention.

The CVH state plan should be based on data, including the burden of CVD in the state and the results of an assessment of policies and legislation that influence heart health. It should also be based on an assessment of regulations, policies, and environmental barriers in work sites, health care settings, schools, and communities. The results of such an assessment will help program planners identify systems change interventions that may be needed to achieve the objectives of the CVH state plan.

The CVH state plan may be a stand-alone plan or an identifiable section within another state plan, such as a larger chronic disease plan. In either case, it should provide guidance for a comprehensive state heart disease and stroke program. The CVH state plan may be packaged in a variety of formats (e.g., executive summary, monograph, visual presentation) for different audiences (e.g., decision makers, public health planners, the health care community, minority health organizations, the general public).

Although developing and updating a comprehensive CVH state plan requires a major commitment of time and staff, such a plan can play a critical role in attaining the state's heart disease and stroke objectives.

State Examples:

- The *North Carolina Plan to Prevent Heart Disease and Stroke 1999–2003* provides a comprehensive vision that builds upon existing services and promotes new strategies for preventing CVD. The plan is based on the socioecological prevention model, which has been proven effective for creating environmental and policy change in multiple levels of society. The plan guides state and local interventions by providing strategies for preventing CVD risk factors, managing CVD, raising public awareness, and developing supportive policies. The plan's strategies are designed to be implemented in collaboration with partners from private and governmental sectors. It will be updated in 2003.
  Program contact: Libby Puckett, Cardiovascular Health Program, North Carolina Division of Public Health/DHHS.
- The *Alabama Cardiovascular State Health Plan* contains recommendations for changing policies, health systems, community settings, and environmental factors that influence CVH. The plan is designed to help policy makers, public health personnel, health care providers, schools, communities, and voluntary organizations develop coordinated approaches to CVD prevention. The plan is organized around three major goals: increasing awareness of CVD and how various sectors (e.g., health care providers and payers, schools, communities) can promote CVH; minimizing CVD risk factors through supportive environments; and promoting the use of recommended treatment guidelines by health care providers and facilitating state residents' access to and use of early detection and treatment options for CVD.
  Program contact: Janice Cook, Cardiovascular Health Program, Alabama Department of Public Health.

Policies

To identify priority policy areas for intervention, the state heart disease and stroke prevention program should assess existing policy and environmental supports. The assessment should also identify elements of the physical and social environments that can be modified to improve CVH-related behaviors.

The assessment should address the needs of priority populations and should focus on health promotion and primary and secondary prevention of CVD and related risk factors, including high cholesterol, high blood pressure, tobacco use, physical inactivity, and poor nutrition. The assessment should identify policies at the state level that could affect communities, such as state legislation that may affect CVH-related policies in schools or agency policies that may affect the implementation of nationally accredited guidelines for primary and secondary prevention of CVD in health care settings.

Although the assessment should initially identify state-level policies and environmental supports, additional assessments should eventually be conducted to identify policies in health care sites, work sites, schools, and communities. As a planning tool, the assessment does not need to be performed statewide for each setting, but the geographical area selected should be justified and should help the state meet the objectives of its CVH state plan.

State Examples:

- The *Oklahoma Cardiovascular Health Program* assessed policies guiding stroke response and care and is working with local heath departments and hospitals to develop stroke protocols. The protocols will guide emergency medical personnel and other hospital personnel in providing comprehensive, appropriate care for stroke patients from the initial call for emergency services through rehabilitation. The CVH Program is collaborating with the AHA Oklahoma affiliate; Oklahoma Foundation for Medical Quality; Oklahoma Hospital Association; and local hospital physicians, stroke coordinators, and emergency medical service units. Although modified to meet Oklahoma's needs, the protocols are based on those developed by the AHA and the National Stroke Association.
  Program contact: Adeline Yerkes, Chief, Chronic Disease Service, Oklahoma State Department of Health.
- *The Healthy Maine Partnership* is a collaborative effort of the Maine Cardiovascular Health Program, the Community Health Program, Partnership for a Tobacco-Free Maine, and the Coordinated School Health Program. The Healthy Maine Partnership is working with 31 local communities and 54 school administrative units to assess local and school policies supporting cardiovascular health, such as tobacco-use policies in public places and nutrition guidelines in schools. The Maine Cardiovascular Health Program will use the assessment results to identify supportive policies and key partners for future policy development.
  Program contact: Debra Wigand, Maine Cardiovascular Health Program, Department of Human Services.

Health Communications

State heart disease and stroke prevention programs and their partners should have the capacity to effectively plan, implement, and evaluate communications and education strategies that support policy and environmental changes for CVH. Recognizing the need for a tool that incorporates the most effective communication models and strategies for change, CDC's Heart Disease and Stroke Prevention Program has developed a tailored edition of CDCynergy for CVH. CDCynergy is a communication planning tool in CD-ROM format that was first created by CDC's Office of Communication in 1998 and then updated as CDCynergy 2001 Basic. The CVH edition has the same features and format as CDCynergy 2001 Basic but includes CVH case examples and resources. It effectively moves the best communication practices promoted by CDC into the mainstream of CVH policy and environmental change efforts. In addition to providing training on specific communication topics such as media and policy advocacy and product development, the tool will help users strategically convey information in ways that advance the overall program goal of making states heart healthy and stroke free.

Communication plans created by state heart disease and stroke prevention programs using CDCynergy 2001 should be based on data from state surveys and burden documents, CVH state plans, and policy inventories. The communication plan should involve partners and their communication resources and should consider multiple and innovative channels to convey key messages, including conferences, workshops, and seminars for select audiences; media outreach; and personal contact with policy and decision makers in health care, workplace, school, and community settings.

State Examples:

- The *West Virginia CVH Program's* partnership with St Mary's Hospital, Genesis Hospital System, led to the development of a social marketing campaign to educate residents of Lincoln County about the symptoms of heart attacks. CDCynergy was used to plan the campaign, and data from BRFSS, household surveys, Prizm national consumer surveys, and hospitals were used to select the target county and develop media messages. Four radio spots and print ads were developed, and a pretest telephone survey was conducted in February 2001. The media campaign was launched in May 2001. It promoted awareness of the symptoms of a heart attack, the importance of immediate medical care, and healthy choices for daily living. The posttest telephone survey was conducted in December 2001 and showed an increased public interest (from 68% in the pretest to 84% in the posttest) in learning more about heart attack and stroke symptoms. Approximately 40% of those surveyed noticed the public service announcements (PSAs) regarding heart attack and stroke. Perceptions regarding stroke and heart attack symptoms closely mirror the results of the pretest survey. Further review of the evaluation results is planned. **Program contact:** Amy Carte, Cardiovascular Health Program, West Virginia Bureau for Public Health.
- The *Georgia CVH Program* has four main components in its communication plan: media advocacy, public relations, advertising, and social marketing. Its major social marketing campaign, "Take Charge of Your Health," is coordinated through the Georgia Coalition for Physical Activity and Nutrition (GPAN). The campaign goal is to communicate three simple messages: Take Action (walk, dance, play), Take 5-A-Day (fruits and vegetables), and Take Down Fat (choices, portions, and preparation). Media for conveying these three messages statewide include billboards, radio PSAs, and educational programs in schools for youth and in community settings for all age groups. Campaign evaluation and communication training for GPAN members and district chronic disease coordinators are under way. **Program contact:** Pamela Wilson, Cardiovascular Health Program, Division of Public Health, Georgia Department of Human Resources.

Professional Development, Training, and Technical Assistance

State heart disease and stroke prevention programs should identify ways to meet the training needs of their staff, partners, and others. Training and technical assistance should be provided to help state and local health department staff and partners acquire the skills needed to support the development and implementation of the CVH state plan. This training may include areas such as population-based interventions, policy and environmental strategies, cardiovascular diseases and related risk factors, primary and secondary prevention strategies, health communication, cultural competency, epidemiology and use of data in program planning, media relations, strategic planning, program management, and evaluation. The state might also provide technical assistance on implementing programs in health care sites, work sites, schools, and communities.

State health departments should assess CVH-related training needs and ensure that ongoing training and skill building are available for state and local health department staff, their CVH partners, health care and human service providers, and priority populations. States also might assist or collaborate

with partners (e.g., AHA, managed care organizations, academic institutions) to provide professional and public education. States need to look for imaginative ways to provide training and skill building, including the use of technology and Web-casting. States should encourage staff to participate in national and regional training programs and conferences and then disseminate what they learn statewide.

State Examples:

- The *Montana CVH Program*, in collaboration with the University of Washington School of Medicine, the Montana Diabetes Project, the Montana Obesity Prevention Program, the Department of Health and Human Services' Office on Women's Health (Region VIII), AHA, and the University of Montana School of Pharmacy and Allied Health Sciences, sponsored a CVH summit in April 2002. The summit provided training on primary and secondary prevention of CVD, with an emphasis on environmental, policy, and system interventions. Strategies to address the needs of priority populations also were highlighted.
  Program contact: Crystelle Fogle, Cardiovascular Health Program, Montana Department of Public Health and Human Services.
- The *Nebraska CVH Program* has developed and conducted a training program for local and state partners (e.g., representatives of local and district health departments, AHA, minority organizations, work site wellness groups, education groups) on environmental and policy strategies to promote CVH. Entitled S.T.E.P.S. (Strategies Toward Environment and Policy Success) for a Healthy Heart, the program addresses policies and environments specific to work sites, schools, faith communities, and the community in general. Participants have used the training materials as a planning tool and as an aid in implementing pilot community projects. Materials are available from the training program.
  Program contact: Jamie Hahn, Cardiovascular Health Program, Nebraska Health and Human Services System.

Funding

Because federal funding for state heart disease and stroke prevention programs only began in 1998, it is difficult to estimate the funding states need to carry out all of the components of a comprehensive program. One state, which we call "state x" here, has developed an estimate that may or may not be typical of other states.

State X, with about 9 million people and heart disease and stroke rates above the national average, needs CVH funding to address the following issues: heart disease and stroke, health promotion, racial disparities in CVD burden, epidemiology, public awareness, high blood pressure, high cholesterol levels, tobacco use, physical inactivity, poor nutrition, diabetes, and obesity. Of its 2001 CVH budget, approximately 30% was from state sources, 55% was from federal sources (the Preventive Health and Health Services Block Grant; CDC's CVH, WISEWOMAN, diabetes, and tobacco programs; and the Department of Agriculture's Nutrition Challenge matching funds), and 15% was from private foundations. State X estimates that it would need $15.6 million to comprehensively address heart disease, stroke, high blood pressure, and cholesterol and the disparate burden of these diseases and conditions among some population groups, as well as an additional $2.7 million to address other risk factors and the associated conditions of diabetes, poor nutrition, obesity, and physical inactivity.

Supporting Evidence and Consensus Documents

In the 1980s, large community demonstration projects that tested multiple intervention approaches for improving CVH were conducted in Finland and the United States. Many of the core capacities that CDC recommends for state heart disease and stroke prevention programs are based on lessons learned from these projects.[9]

Results from these community projects suggested that state health departments can play critical roles in activities such as strategic planning, working with

other stakeholders, ensuring that projects are data-driven, supporting community participation, and providing guidance for quality assurance and intervention approaches. Project evaluators found that "interventions that simultaneously target the community environment as well as organizations, groups, and individuals tend to influence the public's health far more than interventions at any one of these levels alone."[9]

Results from these projects also indicated that policy and environmental interventions were often more effective than direct behavior-change strategies. Social marketing techniques were used to create awareness of CVH issues and to create demand for services, access to primary and secondary prevention, and support for public policy and environmental change.

In addition to the lessons learned from these studies, state health departments also should use the following resources when developing their own comprehensive state heart disease and stroke prevention programs:

- *Preventing Death and Disability from Cardiovascular Diseases: A State-Based Plan for Action.* CVD Plan Steering Committee, Association of State and Territorial Health Officials, 1994.
- Publications of the Advisory Board of the International Heart Health Conferences, including *The Victoria Declaration on Heart Health* (1992), *The Catalonia Declaration—Investing in Heart Health* (1996), *Worldwide Efforts to Improve Heart Health: A Follow-Up to the Catalonia Declaration—Selected Program Descriptions* (1997), and *The Singapore Declaration: Forging the Will for Heart Health in the Next Millennium* (1998).
- *Evaluating Community Efforts to Prevent Cardiovascular Diseases: Community Changes.* Department of Health and Human Services, CDC, 1995.
- *North Carolina Plan to Prevent Heart Disease and Stroke* 1999–2003. North Carolina Heart Disease and Stroke Prevention Task Force, 1999.
- *Women and Heart Disease: An Atlas of Racial and Ethnic Disparities in Mortality. Second Edition* and *Men and Heart Disease: An Atlas of Racial and Ethnic Disparities in Mortality. First Edition.* Available at www.cdc.gov/nccdphp/cvh.
- Policy as intervention: environmental and policy approaches to the prevention of cardiovascular disease. *Am J Public Health* 1995;85:1207-11.
- Community heart health programs: components, rationale, and strategies for effective interventions. *J Public Health Policy* 1993;14(4):463-79.
- Three articles in *Health Education Quarterly* in 1995 (volume 22, number 4): "Environmental and policy approaches to cardiovascular disease prevention through nutrition: opportunities for state and local action;" "Environmental and policy approaches to cardiovascular disease prevention through physical activity: issues and opportunities;" and "Environmental and policy interventions to control tobacco use and prevent cardiovascular disease."

National Leadership

CDC is committed to enhancing the infrastructure, leadership, and population-based programs that state health departments need to facilitate a comprehensive approach for CVH promotion and CVD prevention. CDC will support and collaborate with states on the following activities:

- Developing and implementing programs and policies.
- Building infrastructure by providing resources for professional training and continuous technical assistance and by strengthening capacity in other respects.
- Extending the database for CVH promotion and CVD prevention through new approaches to monitoring and surveillance of CVD-related factors in communities and states.
- Fostering the prevention research that will most directly advance policies and programs for CVH by resolving critical questions.

Forging National Partnerships

CDC has a formal partnership with AHA; the Centers for Medicare & Medicaid Services; the National Heart, Lung, and Blood Institute of the National Institutes of Health (NIH); NIH's National Institute of Neurological Disorders and Stroke; and the Office of Public Health and Science, HHS; through a memorandum of understanding that created the Healthy People 2010 Heart and Stroke Partnership. The goal of the partnership is to maximize the participating organizations' investments in CVH and to capitalize on their individual strengths to achieve the *Healthy People 2010* goal for preventing heart disease and stroke. The partnership divided this goal into the following four separate areas based on the different intervention approaches that would be needed to achieve them:

- Prevention of risk factors.
- Detection and treatment of risk factors.
- Early identification and treatment of heart attacks and strokes.
- Prevention of recurrent cardiovascular events.

The Healthy People 2010 Heart and Stroke Partnership has improved communication, coordination, and collaboration at the national, state, and local levels. Activities proposed by the partnership to meet the *Healthy People 2010* goal and targets include

- Conducting population- and community-based health education and health promotion.
- Coordinating public awareness messages and media activities.
- Effecting environmental, policy, and system changes.
- Jointly promoting professional education and training, including joint presentations, co-hosting of national conferences, dissemination of best practices, and joint consultation on cardiovascular issues for conferences and workshops.
- Facilitating relationship development, support, data collection, and resource sharing.
- Sharing scientific and information resources.

Examples of accomplishments to date include

- Developing a Healthy People 2010 Heart and Stroke Partnership database of activities, which will eventually be made available to the public.
- Developing and implementing the *Act in Time to Heart Attack Signs* campaign, including a joint press conference.
- Developing a year one evaluation report of the strategic partnership.
- Cosponsoring *Cardiovascular Health for All: Meeting the Challenge of Healthy People 2010—A National Conference*, which was held on April 11-13, 2002, in Washington, D.C.

Developing the Cardiovascular Health Collaborative

In 1998, the Health Resources and Services Administration, CDC's Division of Diabetes Translation, and the Institute for Health Improvement formed the National Diabetes Collaborative to aggressively address chronic disease by reducing disparities and increasing access to quality care in federally qualified community health centers. In April 2001, the first Cardiovascular Health Collaborative was initiated and integrated with the Diabetes Collaborative. In July 2002, the collaborative provided training and support to help community health centers and state heart disease and stroke prevention programs improve quality of care by implementing a chronic care model and an improvement process model for CVD management. Future training is planned.

Developing the Action Plan

During 2001–2002, CDC convened more than 100 experts from state, local, national, and international organizations, tribal organizations, and others beyond the health sector to develop a public health strategy to prevent and control heart disease and stroke. This plan addresses the *Healthy People 2010* goal for preventing heart disease and stroke, as well as the two overarching goals of improving the quality and increasing the duration of Americans' lives and eliminating health disparities. The recommendations outlined in this plan will require the involvement and collaboration of a broad array of organizations.

The process included work by five expert panels, which were each asked to address one of the following five components considered essential to the action plan:

- Taking action: putting present knowledge to work.
- Strengthening capacity: improving the organization and structure of public health agencies and partnerships.
- Evaluating impact: monitoring the burden, measuring progress, and communicating urgency.
- Advancing policy: defining the issues and finding the needed solutions.
- Engaging in regional and global partnerships: multiplying resources and capitalizing on sharing experience.

The plan will help chart a course for CDC, state and local health departments, and other partners to achieve national goals for preventing heart disease and stroke over the next 2 decades and beyond. To develop a comprehensive public health strategy for the plan, an action framework was developed that outlines the present reality, a vision of the future, and six broad intervention approaches that can help achieve this vision. The action plan is expected to be available in spring 2003.

Communicating Key Messages

In addition to developing a CVH edition of CDCynergy and providing states with training in its use, CDC is also supporting two projects that include training materials, communication guides, and other materials that state heart disease and stroke prevention programs can use for communicating with decision makers about the role of policies in promoting environmental change for heart health and for communicating with the public about the signs and symptoms of stroke.

Stimulating Priority Research and Translation

CDC provides data, data analysis, applied research, and publications to help ensure that state heart disease and stroke prevention programs have the latest information to assist with state planning and priority setting. CDC's Heart Disease and Stroke Prevention Program translates and disseminates to states and others data and research results that have implications for state heart disease and stroke prevention programs and information on state interventions, lessons learned, and promising practices.

Five of the CDC program's top research priorities include

- Eliminating racial, ethnic, social class, and geographic disparities in CVD.
- Developing and strengthening primary and secondary prevention methods.
- Developing and strengthening policy and environmental interventions.
- Assessing emerging risk factors.
- Increasing understanding of the economic impact of CVD.

State-of-the-art information is available to states on the CDC Web site (www.cdc.gov/cvh), including interactive maps of county-level heart disease and stroke mortality rates. The CDC Heart Disease and Stroke Prevention Program disseminates evidence of substantial geographic, racial, and ethnic disparities in the burden of heart disease and stroke mortality by publishing atlases and these interactive maps. Results of applied research are conveyed to states through conference calls, the State Program listserv, and CDC-sponsored trainings.

Future research directions of the CDC Heart Disease and Stroke Prevention Program are being documented in a strategic research plan to be shared with states and others in 2003. The plan will prioritize research initiatives to advance knowledge about population-based approaches that promote cardiovascular health. Results from these initiatives will be translated and disseminated to public health and health care workers to help them tailor policies and programs to address health promotion and the primary and secondary prevention of heart disease and stroke.

Promoting Program Evaluation

Evaluation goals for state heart disease and stroke prevention programs are to document the following:

- Changes in state capacity to address CVH.
- CVD burden as determined by surveillance data.
- Changes in CVH policies and environmental supports.
- Process in implementing interventions and the impact of these interventions at the state level, within practice settings, and among priority populations.

Evaluation products that CDC has developed for states to use include the following:

- The *Evaluation Framework for State Heart Disease and Stroke Prevention Programs*, which describes the overall evaluation components of state heart disease and stroke prevention programs.
- The Heart Disease and Stroke Prevention State Program Logic Model, a graphic description of the state program that includes expected short-term, intermediate, and long-term outcomes (see Figure 1). By identifying the steps necessary to reach intended outcomes, the logic model indicates where emphasis should be placed in evaluating the process and outcomes of the program.
- *The State Heart Disease and Stroke Prevention Programs: Evaluation Concepts*, which assists states in developing evaluation plans for their own heart disease and stroke prevention programs.

These products are available from the CDC Heart Disease and Stroke Prevention Program. CDC also provides annual evaluation training for state heart disease and stroke prevention program staff and is developing an electronic management information system that will give state programs the ability to produce evaluation reports. The system also will enhance the technical assistance that CDC provides to state programs and will include state resources.

Promoting Professional Development

CDC provides state heart disease and stroke prevention programs with training and skill-building experiences through national conferences, informational conference calls, and workshops addressing areas such as CVH evaluation, the CVH edition of CDCynergy, the CVD Collaborative, and partnering with managed care. From 1999 to 2002, the Cardiovascular Health Practitioner's Institute provided intensive training and skill-building to state heart disease and stroke prevention program managers and AHA state health department liaisons from 12–15 states each year. The training was co-sponsored by CDC, the Association of State Chronic Disease Directors, AHA, and the University of Rochester Department of Community and Preventive Medicine. The goal of the training is to enhance participants' abilities to develop and maintain public health programs for preventing and controlling CVD, reducing related risk factors, eliminating disparities, and promoting CVH. The third institute was held September 24–29, 2002. In future years, an annual skill-building workshop will be provided to state heart disease and stroke prevention program staff from all states. CDC also provides other training programs, including the evidence-based chronic disease prevention training sponsored by Saint Louis University.

Progress to Date and Challenges Ahead

In 1998, the first eight states received CDC funding to establish heart disease and stroke prevention programs. As of June 2002, 29 states and the District of Columbia had CDC-funded state heart disease and stroke prevention programs. States are collaborating with new and different partners to coordinate efforts and avoid duplication. CDC is also increasing its efforts to coordinate activities among the different CDC programs that deal with CVH. Central to these efforts has been the establishment of CDC's Cardiovascular Health Coordinating Committee, which includes the directors of the Division of Adult and Community Health, the Division of Adolescent and School Health, the Division of Diabetes Translation, the Division of Nutrition and Physical Activity, and the Office on Smoking and Health. Collaboration among these divisions and offices facilitates

interaction with state programs in their respective areas and can help to streamline relationships at national and state levels.

In 2001, CVD became a major focus of collaboration among key national agencies when CDC entered into the Healthy People 2010 Heart and Stroke Partnership. (See the Forging National Partnerships section for a list of other partners.) Additional partnership agreements are in place with groups such as the Health Resources and Services Administration; the National Stroke Association; the American College of Cardiologists; Health Canada; and the Association of State and Territorial Health Officials, including its affiliates, the Association of State and Territorial Chronic Disease Program Managers, the Cardiovascular Council, and the Association of State and Territorial Directors of Health Promotion and Public Health Education. Agreements with both traditional and nontraditional partners are expected to increase at national and state levels; such partnerships stand to benefit all who are concerned with promoting CVH and preventing CVD.

The many challenges ahead for CDC, the states, and their partners as they work together to reduce the massive burden of CVD include the following:

- Mobilizing and coordinating national and state efforts.
- Garnering resources to fund programs in all 50 states and U.S. territories.
- Increasing efforts to reduce racial, ethnic, gender, and geographical disparities.
- Increasing CDC's capacity to help states address CVD.
- Identifying priorities and promising interventions.
- Enhancing the capacity of state health departments to implement policy and environmental strategies.
- Expanding surveillance and monitoring of heart disease and stroke.
- Increasing the science base for interventions.
- Increasing applied research and program evaluation.

Resources

Web Resources

Communications and Health Promotion

University of Kansas's Community Toolbox. ctb.lsi.ukans.edu. Provides information on how to develop, manage, and evaluate community projects; includes tools and helpful hints.

HealthComm KEY. www.cdc.gov/od/oc/hcomm/additsource.pdf. Provides communications resources.

CDCynergy. www.cdc.gov/communication/CDCynergy.htm. Provides an interactive CD-ROM designed as a decision-making tool and step-by-step guide for planning health communications programs. Contact the CDC Heart Disease and Stroke Prevention Program for the CVH version.

Social Marketing

www.social-marketing.com/. Provides information on social marketing publications and the latest news in the field.

Evaluation

www.cdc.gov/eval/resources.htm. Provides CDC evaluation resources, including logic models, evaluation standards, organizations, and evaluation concept documents.

University of Kansas's Community Toolbox, Evaluation Model. ctb.lsi.ukans.edu/tools/EN/section_1007.htm. Provides a model for evaluating comprehensive community initiatives.

Success Measures Guidebook. www.developmentleadership.net/smp/manual/toc.htm. Provides a step-by-step guide for developing and implementing an evaluation plan and specific outcome indicators to help define success and effective allocation of resources.

Funding

University of Kansas's Community Toolbox, Grant Writing Tools. ctb.lsi.ukans.edu/tools/en/chapter_1042.htm. Provides information on how to apply and receive grants and other financial resources.

The Foundation Center. fdncenter.org. Provides the foundation's annual reports, directories, books, and periodicals on fund-raising, program planning, and current data on the nation's largest funders.

Interventions and Program Development

Centers for Disease Control and Prevention (CDC). www.cdc.gov/cvh. Provides information on heart disease, stroke, and state activities, including state program contacts.

Health Policy Coach. www.policymatters.org. Provides tools, strategies, and information for creating policy change in communities.

Health Disparity Collaboratives. www.bphc.hrsa.dhhs.gov/programs/hdcprograminfo.htm. Provides information on interventions in federally qualified health centers to improve health outcomes, including management of CVD, in underserved populations.

Fit, Healthy, and Ready to Learn: School Health Policy Guide. www.nasbe.org/healthyschools/fithealthy.mgi. Provides direction on establishing an overall policy framework for school health programs and specific policies on physical activity, healthy eating, and tobacco-use prevention.

Get With the Guidelines. www.americanheart.org/presenter.jhtml?identifier=1165. Provides a hospital-based CVD quality improvement program.

G8 Promoting Heart Health Telematics Project. www.med.mun.ca/g8hearthealth. Provides a qualitative database of best practices for CVH programs; includes heart health issues such as tobacco control, diet, physical activity, psychosocial factors, hypertension, diabetes, and lipid management.

American Dietetic Association. www.eatright.org/gov/tools.html. Provides grassroots tools for food and nutrition policy.

Public Education Network: Communities at Work. www.publiceducation.org/interventions. Provides a guidebook of strategic interventions for engaging the community in school improvement to create systemic change through community dialogue, constituency building, engagement of practitioners, collaboration with districts, policy analysis, and legal strategies.

Turning Point Publications and Resource. www.wkkf.org/Programming/Resources.aspx?CID=8. Provides a variety of publications and resources produced by Turning Point (national initiative of the W.K. Kellogg and Robert Wood Johnson foundations) that provide actionable, evidence-based lessons for policy, practice, and research.

Center for Livable Communities. www.lgc.org/center/. Provides resources on building livable communities, including selected publications, manuals, conferences/trainings, and a land-use resource library.

National Committee for Quality Assurance. www.ncqa.org. Provides resources such as *The Business Case for Health Care Quality* and *The State of Managed Care Quality, 2001*.

Partnerships, Alliances, and Coalitions

University of Kansas's Community Toolbox, Community Work Station. ctb.lsi.ukans.edu/tools/CWS/coalitionbuilding/create_maintain_coalitions.htm. Provides information on establishing and maintaining partnerships, including coalitions.

Collaboration: What Makes it Work. www.wilder.org/pubs/collab_wmiw/index.html. Provides a review of research literature on factors influencing successful collaboration among service delivery agencies.

Building Community Health Partnerships. www.communityhealthpartners.org/default.cfm. Provides information on successful community health partnership models.

Coalition for Healthier Cities and Communities. www.healthycommunities.org/usa/index.cfm. Provides information on a collaborative established to improve the quality of life in communities through community-based development and coalition building.

Surveillance and Research

National Center for Health Statistics. www.cdc.gov/nchs. Provides data systems on vital events, health status, lifestyle, exposure to unhealthy influences, the onset and diagnosis of illness and disability, and the use of health care.

Centers for Medicare & Medicaid Services. cms.hhs.gov. Provides CVD-related data and statistics.

National Heart, Lung, and Blood Institute. www.nhlbi.nih.gov/resources/index.htm. Provides scientific resources on heart disease.

American Heart Association/American Stroke Association. www.americanheart.org. Provides scientific resources on heart disease and stroke.

CDC CVH Statistical Information. www.cdc.gov/cvh/statisticalinfo.htm. Provides data such as interactive maps on county-specific heart disease mortality rates by state, racial/ethnic group, and gender.

Print Resources

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A Comprehensive Approach to Cancer Prevention and Control: A Vision for the Future

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A Comprehensive Approach to Cancer Prevention and Control: A Vision for the Future

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Introduction

The Centers for Disease Control and Prevention (CDC) defines comprehensive cancer control as "an integrated and coordinated approach to reducing cancer incidence, morbidity, and mortality through prevention, early detection, treatment, rehabilitation, and palliation" (www.cdc.gov/cancer/nccp/index.htm). This comprehensive approach is based on the premise that effective cancer control planning and programming should address a continuum of services, from primary prevention and early detection through effective treatment, quality care, and end-of-life services such as pain relief.

CDC is encouraging state, territorial, and tribal health agencies to adopt cancer control programs that are "comprehensive" in several other senses as well. They should be comprehensive in the functions they incorporate (e.g., basic and applied research, surveillance, clinical services, health communications). They should also comprehensively address all major types of cancer and the needs of all population groups, while giving special emphasis to the needs of groups disproportionately affected by cancer. Finally, they should be comprehensive in recruiting a wide base of partners and in coordinating the efforts of these partners in developing and implementing a cancer prevention and control plan that all stakeholders can embrace.

Health departments can expect to face numerous issues as they work to develop comprehensive cancer control programs. These include

- Establishing an effective infrastructure (i.e., administrative and organizational systems).
- Obtaining adequate resources (e.g., staff, funding) for cancer control.
- Accessing sufficient cancer data (e.g., incidence data, treatment data) to make informed program decisions.
- Coordinating cancer control efforts.
- Reducing racial and ethnic disparities in cancer burden and in access to appropriate treatment.
- Conducting ongoing evaluations of program effectiveness.

Cancer Burden

The American Cancer Society (ACS) estimates that, in 2003, more than 556,500 Americans will die of cancer—more than 1,500 people every day—and that about 1,334,100 new cases of cancer will be diagnosed.[1] These estimates do not include carcinoma in situ (except urinary bladder) or basal and squamous cell skin cancers. Cancer is the second leading cause of death in the United States, accounting for one of four deaths. From 1950 to 1991, cancer death rates increased steadily. Rates began to decline in 1991, largely because of a decline in rates of lung cancer deaths.[2] However, the aging and increasing size of the U.S. population will cause the total number of cancer cases to double by 2050 if current incidence rates remain steady.[3]

The National Cancer Institute (NCI) estimates that almost nine million Americans with a history of cancer were living in 1997; some were under treatment and some were considered cured.[4] The combined 5-year survival rate for Americans with any type of cancer is 62%.[1]

Table 1. Statistics for Selected Cancers

Cancer Type (ICD-9*)	No. of New Cases (est. for 2003)	No. of Deaths (est. for 2003)	Five-Year Survival Rate (%)
All sites (140–239)	1,334,100	556,500	62
Breast (174)	212,600	40,200	97 (localized)
Prostate	220,900	28,900	97
Lung (162)	171,900	157,200	15
Colon (153) and rectum (154)	147,500	57,100	62

*ICD-9 = *International Classification of Disease*, 9th Revision.
Source: American Cancer Society, *Cancer Facts and Figures, 2003* (Ref. 1).

The ACS estimates that cancers that can be detected by screening account for about half of all new cancer cases. If all these cancers were detected at a localized stage through appropriate screening, the 5-year survival rate would approach 95%.[1] For these reasons, the bulk of cancer prevention and control research dollars are dedicated to the prevention and early detection of these cancers.

African Americans have higher rates of many cancers than other racial or ethnic groups. During 1992–1999, the overall cancer incidence rate per 100,000 persons was 526.6 among African Americans, 480.4 among whites, 329.6 among Hispanics, 348.6 among Asian/Pacific Islanders, and 244.6 among American Indians/Alaska Natives. Racial disparities in outcomes are often even more pronounced than disparities in incidence rates. For example, although breast cancer is diagnosed more often in white women, African American women are more likely to die of the disease. The overall cancer mortality rate is also about one-third higher among African Americans than among whites.[1]

Mortality rates also vary by gender. The most recent age-adjusted annual cancer death rates were 259.1 for U.S. men and 171.4 for U.S. women.[3]

Cancer's financial costs are significant. The National Institutes of Health estimates that cancers cost the nation more than $171.6 billion in 2002: $60.9 billion in direct medical costs (i.e., expenditures for medical procedures and services associated with treatment and care for cancer), $15.5 billion in indirect morbidity costs (such as the value of work disability and absenteeism associated with cancer), and $95.2 billion for indirect mortality costs (such as the cost of lost productivity due to premature death). More than half of all medical costs for cancer are estimated to be for the treatment of breast, lung, prostate, and colorectal cancers,[4] again underscoring the importance of directing prevention and early detection activities toward these cancers.

The nonmonetary costs of cancer are also substantial but cannot be adequately quantified. Cancer pain, though usually manageable, can be a significant

problem, as can the discomfort of treatment and damage to the cancer patient's self-image. After treatment for cancer, many people can continue an active, vital life—but they must live with the fear and uncertainty that the cancer might return. As one cancer survivor commented, "the fear for me now, eight and a half years out from my diagnosis, is generally background noise. Most of the time I am not aware of it, yet it waits ready to pounce at the slightest provocation."[5] Because between eight and nine million Americans have a history of cancer, the toll of the disease is enormous no matter how the burden is calculated.

Healthy People 2010 Cancer Objectives

Healthy People (HP) 2010,[6] which defines the nation's long-term health objectives, contains 15 health objectives in a chapter focusing on cancer and additional related objectives in chapters on nutrition, oral health, and tobacco. The overarching goal of these objectives is to reduce the overall burden of cancer and to eliminate racial and ethnic disparities in cancer morbidity and mortality rates.

Specific *HP 2010* cancer objectives include the following:

- Reduce the overall cancer death rate per 100,000 population from 202.4 cancer deaths in 1998 to 159.9, as well as reduce mortality rates from the following specific cancers:
- Lung (to 45 deaths per 100,000).
- Breast (to 22 deaths per 100,000).
- Cervix (to 2 deaths per 100,000 women).
- Colon/rectum (to 14 deaths per 100,000).
- Oropharynx (to 3 deaths per 100,000).
- Prostate (to 29 deaths per 100,000 men).
- Melanoma (to 3 deaths per 100,000).
- Increase the proportion of people who use at least one of the following protective measures to reduce sun exposure and skin cancer risk:
- Avoid the sun between 10 a.m. and 4 p.m.
- Wear sun-protective clothing when exposed to sunlight.
- Use sunscreen with a sun protection factor (SPF) of 15 or higher.
- Avoid artificial sources of ultraviolet light.
- Increase the proportion of physicians and dentists who counsel their patients at high risk for cancer about the importance of giving up tobacco use, increasing physical activity, and having the appropriate cancer screening tests.
- Increase the proportion of women 18 years of age or older who receive Papanicolaou (Pap) tests:
  - Increase the proportion who have ever received a Pap test to 97%.
  - Increase the proportion who have received a Pap test within the preceding 3 years to 90%.
- Increase the proportion of adults 50 years of age or older who receive colorectal cancer screening examinations:
  - Increase the proportion who have received a fecal occult blood test within the preceding 2 years to 50%.
  - Increase the proportion who have ever received a sigmoidoscopy to 50%.
- Increase the proportion of women 40 years of age or older who have received a mammogram within the preceding 2 years to 70%.
- Increase to 45 the number of states that have a statewide population-based cancer registry that captures case information on at least 95% of the expected number of reportable cancers.
- Increase the proportion of people with cancer who live 5 years or longer after diagnosis to 70%.

All cancer prevention and control programs are encouraged to incorporate the goals of *HP 2010* into their program activities.

Public Health Opportunities in Cancer Control

Primary, Secondary, and Tertiary Prevention

Many factors that contribute to cancer deaths are preventable. It has been estimated that from 50% to 70% of cancer deaths are attributable to preventable risk behaviors;[7] 30% of cancer deaths can be attributed to tobacco use and more than 30% to

poor nutrition.[8] Obviously, the public health community needs to focus on such preventable risk factors.

Cancer prevention can be divided into three stages: primary, secondary, and tertiary. *Primary prevention* refers to the complete prevention of disease, often through methods that inhibit exposure to risk factors. The four most important risk factors for cancer are tobacco use, lack of physical activity, exposure to ultraviolet light, and poor nutrition. Primary prevention is often used synonymously with prevention.

Secondary prevention activities detect disease early and limit disease effects after diagnosis. Outcomes for patients with breast cancer, for example, can be dramatically improved through early detection followed by appropriate treatment.

Tertiary prevention involves preventing further disability and restoring a higher level of functioning in someone with a disease. Like secondary prevention, tertiary prevention can involve treatment; however, it also includes rehabilitation and pain control. Even though cancer pain can be relieved through proper therapies, the National Cancer Institute suggests that the undertreatment of pain is a serious and neglected public health problem.[9] To help alleviate this problem, public health organizations should work with medical partners to ensure that cancer patients receive effective pain relief.

Although tertiary prevention of cancer is not often an emphasis of public health, local programs that are adopting a comprehensive cancer approach need to work with partners to ensure that patients with cancer receive appropriate tertiary care. Prevention opportunities offered through a particular intervention will vary depending on the risk factor or stage of disease at which the intervention is directed and the type of cancer being addressed.

Essential Strategies and Interventions

Programmatic Interventions

Cancer prevention and control interventions can be directed at individuals, at health care providers or systems, or at organizations such as religious institutions or employers. Rates of cancer-related illness and death can be lowered by increasing public awareness about cancer and its risk factors, promoting behavior that decreases people's cancer risk, and providing people with better access to cancer-related health care services.

Environmental and policy actions affect communities, work places, homes, and schools, influencing lifestyle choices that people make. Environmental factors, defined broadly to include smoking, diet, and infectious disease, as well as some chemicals and radiation, are associated with perhaps three-quarters of all cancer deaths in the United States.[1] Strong regulatory controls and promotion of safe occupational practices, in combination with healthier individual lifestyle choices, can be effective in reducing cancer incidence and mortality rates. Policy and environmental interventions specific to cancer risk factors, such as those that encourage physical activity, good nutritional choices, or tobacco use cessation, are especially useful in supporting behavioral change among individuals. (See Chapter 7 on physical activity and nutrition and Chapter 8 on tobacco use.)

Interventions important for the prevention and early detection of cancer include those designed to reduce the prevalence of smoking, reduce people's consumption of fat and increase their consumption of fiber, increase people's level of physical activity, increase the percentage of women who undergo regular breast cancer screening and Pap testing, increase the proportion of the population over 50 years of age who are screened for colorectal cancer, decrease people's level of ultraviolet radiation exposure, and encourage the use of appropriate state-of-the-art cancer treatment.

In The *Guide to Community Preventive Services* (also called The *Community Guide*; available at www.thecommunityguide.org), the Task Force on Community Preventive Services recommends specific evidence-based interventions for promoting breast, cervical, and colorectal cancer screening; preventing sun exposure and promoting skin protection; and helping people make informed decisions about screening for cancers. It also identifies areas for future prevention research and programming and includes chapters related to tobacco control and physical activity. When choosing or designing interventions, decision-makers should consider these evidence-based recommendations as they examine their own needs, goals, resources, and constraints.

The North Carolina example below provides a clear model for how individual site-specific and risk-factor-specific interventions can be coordinated within a framework that integrates surveillance, communications, policy, and evaluation. Currently, interventions implemented through cancer prevention and control programs often overlap with those implemented through other programs. A comprehensive cancer control approach would foster collaboration among such overlapping programs and, as a result, potentially provide more effective interventions at a lower cost.

Comprehensive Cancer Control Programs in Action—North Carolina: Since it first received CDC funding for comprehensive cancer control in 1998, North Carolina has expanded its planning and coordination efforts, developed and implemented the statewide "Nutrition Challenge" campaign, created professional education resources to promote colorectal cancer screening, developed a campaign to inform people about clinical trials for cancer prevention and control, enhanced its youth tobacco control efforts, and designed a comprehensive evaluation plan. These activities were selected as funding priorities by the North Carolina Advisory Committee on Cancer Coordination and Control. (www.nccancer.org/ccplan06.htm)

Using Data and Research Results to Design Interventions

Accurate and complete data and solid research form the underpinnings for comprehensive cancer control. They help planners to understand the extent of the cancer burden and the existing infrastructure to address that burden. Data and research help ensure that politically popular strategies are also sound.

Because a major goal of public health is to translate research into effective practice, partners should be encouraged to participate in the data review process, reviewing data that document the burden of cancer and its costs in human and monetary terms.

Information useful in assessing and addressing (through interventions) cancer burden include data derived from basic and applied research; data on the relevance, efficacy, and cost-effectiveness of possible intervention strategies; and data on the existing or developing capacity to implement effective interventions. Such data should help public health officials select relevant and affordable intervention strategies that they can tailor to priority populations and implement successfully. When incorporated into an organization's comprehensive cancer control plan, these strategies will provide all stakeholders with a blueprint for action to address the cancer burden.

Comprehensive Cancer Control Programs in Action—West Virginia: In addition to using data from the Cancer Registry and the Behavioral Risk Factor Surveillance System, West Virginia's Comprehensive Cancer Control Coalition has used the nationwide oncology outcomes database of the American College of Surgeons to describe patient-care patterns and has used evaluation studies and marketing data (such as the NCI Consumer Health Profiles) to help plan intervention programs. (www.cdc.gov/cancer/ncccp/contacts/wv.htm)

Comprehensive Cancer Control Programs in Action—Illinois: To select priorities for its comprehensive cancer plan, the Illinois state health department and its cancer control partners created several work groups. These work groups submitted priorities for their respective areas to the partnership. These were collapsed into six overarching priorities for the state cancer plan. For each priority, one or more related strategies, each involving multiple recommended activities, were approved by the partnership. (www.cdc.gov/cancer/ncccp/contacts/il.htm)

Evaluation data, the means by which the effectiveness of programs are measured, provide feedback for ongoing refinement of the program planning and implementation process. Core evaluation activities include surveillance (i.e., identifying and monitoring cancer and risk factor trends in the general population and cancer-burden disparities among groups of people) and the collection of data measuring the process and outcomes of program activities.

A comprehensive cancer control plan should be reviewed on a specified, routine basis to determine whether its objectives are being met and whether program activities should be redirected. Supervising officials should ensure that evaluation activities are useful, feasible, accurate, and ethical. A detailed discussion of how to conduct program evaluations can be found in "Framework for program evaluation in public health."[10] This document can be accessed at www.cdc.gov/eval/framework.htm.

Opportunities for the Prevention and Control of Selected Cancers

Five cancers have been chosen for discussion because of 1) their importance in new cancer cases and cancer deaths (breast, colorectal, and prostate), 2) the ability to detect them early through screening (breast, cervical, and colorectal), 3) their increasing prevalence (melanoma), and 4) their potential for 5-year survival with early diagnosis (cervical and prostate).

Breast Cancer Interventions

Breast cancer is the most common type of nondermatologic cancer among women in the United States. Because opportunities for the primary prevention of breast cancer are limited, we encourage public health practitioners to focus on secondary prevention (i.e., on early detection and appropriate treatment). Regular use of screening mammograms can help reduce the risk of dying of breast cancer. For women aged 50–69, strong evidence indicates that screening lowers this risk by 30%. For women in their 40s, the risk can be reduced by about 17%.[7] The 5-year survival rate for women with localized, early-stage breast cancer is excellent—97%.[1]

A number of states have state- and CDC-funded programs to encourage breast cancer screening. An example of a nationwide program is the CDC-funded National Breast and Cervical Cancer Early Detection Program (NBCCEDP; information is available at www.cdc.gov/cancer/nbccedp/index.htm). Through this program, CDC and its partners in state, tribal, and territorial health agencies provide low-income, uninsured, or underinsured women free or low-cost breast and cervical cancer screening. The program operates in all 50 states, the District of Columbia, 6 U.S. territories, and 14 American Indian/Alaska Native tribal organizations.

Comprehensive Cancer Control Programs in Action—Nebraska: To help ensure diagnosis and treatment for women with breast or cervical cancer, Nebraska's Every Woman Matters program collaborates with the Junior League of Omaha and the Susan G. Komen Foundation to sponsor the annual Race for the Cure and associated activities, with the proceeds going to the program. The Breast and Cervical Cancer Advisory Committee also does fundraising, and providers throughout the state have donated their services to women who could not otherwise afford screening. (www.cdc.gov/cancer/ncccp/contacts/ne.htm)

Cancer support groups, such as the American Cancer Society's Reach to Recovery program, are often a valuable resource for women being treated for breast cancer, as well as for their families and friends.

Cervical Cancer Interventions

Cervical cancer is not common in the United States. Although the incidence rate has leveled off in the last few years, until then incidence and mortality rates had both decreased steadily for 50 years. A major reason for these decreases is the widespread use of screening for cervical cancer with the Pap test. As a result, preinvasive lesions of the cervix are detected more frequently than invasive cancer.[1]

The annual cervical cancer incidence rate among African American women is still substantially higher than that among white women (13.9 versus 8.8 per 100,000 in 1999).[11] Health officials should institute screening programs and, to reduce this disparity, behavioral change interventions that target underserved African American populations. Behaviors to be promoted include limiting one's number of sex partners, delaying sexual intercourse, using condoms, and avoiding tobacco products.

Cervical cancer screening is often offered through programs that provide both breast and cervical cancer education and screening services. The CDC-funded NBCCEDP discussed in the previous section is an example of a nationwide screening program that addresses cervical cancer. A goal of the NBCCEDP is to identify those women who have not had a Pap test in at least 5 years. Sixty percent of women diagnosed with cervical cancer are in this group, and many of them have a poor prognosis; however, women whose cervical cancer is diagnosed and treated early have a 5-year survival rate of 92%.[1]

Colorectal Cancer Interventions

Colorectal cancer is the second most common nondermatologic cancer in the United States. Definite risk factors for colorectal cancer include a personal or family history of colorectal cancer, colon polyps, or inflammatory bowel disease. Other potential risk factors include smoking, physical inactivity, a high-fat and/or low-fiber diet, alcohol consumption, and low intake of fruits and vegetables.

The number of deaths from colorectal cancer and the incidence of the disease can both be reduced by detecting and removing precancerous polyps and by detecting and treating the cancer in its early stages. Precancerous polyps can be present in the colon for years before invasive cancer develops. The 5-year survival rate for patients with colorectal cancer (all stages) is 62%.[1]

One way to promote colorectal cancer screening nationwide is by educating health care providers and the public about the benefits of screening, the availability of screening procedures, and current screening guidelines. CDC contributes to this educational process through its Screen for Life—the National Colorectal Cancer Action Campaign (www.cdc.gov/cancer/screenforlife/index.htm), and the National Colorectal Cancer Roundtable (www.cdc.gov/cancer/partners/fp–nccr.htm).

Prostate Cancer Interventions

Other than skin cancer, prostate cancer is the most commonly diagnosed form of cancer among men in the United States and is second only to lung cancer as a cause of cancer-related death among men. Age, race, ethnicity, and family history are all significantly associated with risk for prostate cancer. The incidence of prostate cancer is substantially higher among African American men than among white men (229.3 versus 152.3 per 100,000 in 1999).[11]

Medical and public health experts agree that every man needs balanced information on the pros and cons of prostate cancer screening to help him make an informed decision. Balanced information is important because medical experts disagree about whether men should be screened regularly for prostate cancer.

Those who encourage regular screening believe current scientific evidence shows that finding and treating prostate cancer early, when treatment might

be more effective, may save lives. They recommend that all men who have a life expectancy of at least 10 years should be offered the prostate-specific antigen blood test and digital rectal examination annually beginning at age 50. They also recommend offering screening tests earlier to men at higher risk for prostate cancer, specifically African American men and men who have a father or brother with prostate cancer. They do not recommend routine screening, but instead using a form of shared decision-making.

Those who do not recommend regular screening want convincing evidence that finding early-stage prostate cancer and treating it is beneficial. They believe that some of these cancers detected by screening may never affect a man's health and that treating them could cause temporary or long-lasting side effects such as impotence and incontinence. Because they believe it is unclear if the potential benefits of screening outweigh the known side effects of screening and treatment, they recommend that all men be given information on the pros and cons of screening before making their own screening decision.

Results from clinical trials that are currently underway are expected in 5 to 10 years, and these results will help to clarify guidance about prostate screening. Currently, CDC encourages each man to make his own decision about prostate cancer screening in consultation with his physician. This decision should be based on an understanding of his own risk factors and the risks and benefits of screening and the alternatives. CDC and a number of state and academic partners are conducting research and developing educational materials to promote informed decision making for prostate cancer screening.

Skin Cancer Interventions

Among Americans, more than 1 million cases of the highly curable basal cell or squamous cell cancers are diagnosed each year. The American Cancer Society estimates that melanoma, the most serious form of skin cancer, will be diagnosed in over 54,000 people in 2003.[1] However, even melanoma is treatable if detected early: the 5-year survival rate of patients with localized melanoma is 96%.[1]

Risk factors for skin cancer include excessive exposure to ultraviolet radiation, fair complexion, occupational exposure to certain chemicals, a family history of skin cancer, and multiple or atypical moles. Strategies to help prevent skin cancer include limiting or avoiding exposure to the sun during the midday hours, covering the skin when outdoors, and using a sunscreen with a sun protection factor (SPF) of 15 or greater. Because of the possible link between severe sunburns during childhood and risk for melanoma in later life, children, in particular, should be encouraged to avoid excessive sun exposure.

CDC, in conjunction with national partners such as the Federal Council on Skin Cancer Prevention and the National Council on Skin Cancer Prevention, has developed epidemiological research and monitoring systems to determine national trends in sun protection behaviors and attitudes about sun exposure. The CDC-funded Skin Cancer Primary Prevention Education Initiatives are an example of a nationwide program to address sun safety. In 1998, CDC launched its national skin cancer prevention campaign, Choose Your Cover, designed to promote sun protection behaviors (www.cdc.gov/ChooseYourCover). Other skin cancer prevention activities include supporting intervention demonstration projects and developing guidelines for skin cancer education in schools.

Infrastructure to Support Programs

Program Management and Administration

Building infrastructure is a critical activity in any comprehensive approach to cancer prevention and control. Such infrastructure, including staff, funding, and in-kind support from partners, must be adequate to support the implementation of program activities.

To build an effective infrastructure for a comprehensive cancer prevention and control

Figure 1: Building Blocks of Comprehensive Cancer Control Planning

Objectives	Planning Activities							Outcomes	Planning Goal
Enhance Infrastructure	Assess infrastructure needs and capacity	Gain buy-in from leadership of coordinating agency	Identify/ hire dedicated coordinator/ staff	Create core planning team	Involve other cancer-related staff of the coordinating agency/ies	Develop work plan to guide the planning process	Coordinate and monitor the CCC process staff	•Management and administrative structures and procedures developed. •Planning products produced, disseminated and archived	THE PLAN COPLETED REVIEWED DISSEMINATED
Mobilize Support (funding, resources, political will etc.)	Assess current level of support	Secure funds and in-kind resources for planning	Build support among the public and private sectors	Publicize efforts of the partnership	Develop approaches for funding plan strategies	Reassess partnership representation and coverage for implementation		•Partnership develops priorities for allocation of existing resources •Gaps in resources and level of support identified	
Utilize Data/Research	Build linkages to registry and other data agencies and sources	Identify available data/ research	Review data and research as the basis for Plan objectives and strategies	Assess data gaps	Collect needed data if feasible &/or incorporate into Plan	Identify or collect baseline data against which to measure outcomes		•Planning and research data reviewed for needs assessment and strategy development •Data/research gaps identified	
Build Partnerships	Identify, contact, and invite potential partners	Assess partner interest and capacity	Prepare for first partnership meeting	Agree on goals, vision and decision-making process with partners	Establish partnership leadership	Create work groups	Assess partner satisfaction	Develop ways for new members to join & non-members to provide input	•Original members remain committed as new members join. •Partnership/subcommittee meetings held and attended.
Assess/ Address Cancer Burden	Organize partnership around areas of interest	Determine critical areas of burden and high-risk populations	Assess gaps in strategies already in place	Create measurable goals and objectives for plan	Identify possible intervention strategies	Prioritize goals, objectives and strategies	Identify implementing organizations for plan strategies	•Target areas for cancer prevention and control selected and prioritized.	
Conduct Evaluation	Identify resources and staff for evaluation	Define planning evaluation questions	Document the planning process	Identify emerging challenges, solutions, and outcomes of the planning process	Provide TA/ training on evaluation to partners	Create evaluation plan for implementation		•A strategy for assessing planning process, monitoring implementation, and measuring outcomes in place.	

program, the coordinating agency should provide at least a full-time coordinator and preferably several dedicated staff positions. Because of the importance of cancer data for identifying problems, evaluating programs, and making decisions, the core planning team for any comprehensive cancer control program should include cancer registry personnel as well as people with expertise in evaluation and epidemiology both from within and outside the health department.

Statewide Comprehensive Cancer Control Plans

Since 1997, CDC has evaluated state-specific approaches to comprehensive cancer prevention and control planning in a series of case studies and assessments. The results of these evaluations can be found in *Essential Elements for Developing/Expanding Comprehensive Cancer Control Programs* (www.cdc.gov/cancer/ncccp/elements/index.htm).

The case studies both illustrate barriers to fully implementing comprehensive approaches and provide examples of successful comprehensive programs. CDC's *Guidance for Cancer Control Planning* (www.cdc.gov/cancer/ncccp/index.htm) also suggests specific activities (called building blocks for comprehensive cancer control planning) to help public health agencies and their partners develop a comprehensive cancer control plan and establish a comprehensive cancer control program. These building blocks are presented graphically in Figure 1. Estimates of the time needed to complete the activities suggested in the building block model range up to 2 years.

A comprehensive cancer control plan that is thorough, integrated, and realistic will provide participating organizations with a detailed outline of

what each is doing and allow for better coordination of activities. Comprehensive cancer control plans should

- Include a population-based assessment of the cancer burden in the jurisdiction.
- Include short-term and long-term goals, measurable objectives, proposed strategies for reducing the cancer burden, and a plan for evaluating the effectiveness of proposed interventions.
- Be created with diverse partners, inside and outside the health department, who are committed to achieving the goals and objectives of the plan.
- Address cancer-related issues across a continuum of care, including those associated with primary prevention, early detection, treatment, rehabilitation, pain relief, and survivorship.

Surveillance and Evaluation

Using Data and Research

The commitment of participants in comprehensive cancer control planning will be substantially influenced by the quality of the data on which the planning is based.

Comprehensive Cancer Control Programs in Action—Kentucky: To define its priorities and select targets for intervention, the Kentucky Cancer Program administered a needs survey to cancer stakeholders throughout the state. It then used data from this survey and from a review of existing categorical plans and of *Healthy Kentuckians 2010* goals to develop a plan that contains 14 recommended actions and from one to four priority strategies for executing each of them. (www.cdc.gov/cancer/ncccp/contacts/ky.htm)

To evaluate their effectiveness, comprehensive cancer control programs need an established mechanism with which to identify and track cancer case data, including the extent of disease, the kinds of treatment patients receive, and patient outcomes (death or survival). Such mechanisms also allow them to monitor overall changes in disease and risk-factor rates as well as changes within specified geographic areas and populations.

Sources of data on cancer-related deaths, cancer incidence, and cancer screening include vital records; cancer registries; the Behavioral Risk Factor Surveillance System (BRFSS, www.cdc.gov/nccdphp/brfss); state cancer registries supported by CDC's National Program of Cancer Registries (NPCR, www.cdc.gov/cancer/npcr/register.htm); and cancer registries participating in NCI's Surveillance, Epidemiology, and End Results (SEER) program (www.seer.cancer.gov). Another data source is the CDC-funded National Breast and Cervical Cancer Early Detection Program (www.cdc.gov/cancer/nbccedp/index.htm), which maintains program records incorporating a set of standardized data elements, called minimum data elements or MDEs; these records provide consistent and complete service and outcome information on women screened by the program. Cancer control programs should also incorporate data collection activities into their own plans.

Comprehensive Cancer Control Programs in Action—Northwest Portland Area Indian Health Board: Although American Indian/Alaska Natives are generally thought to have disproportionately high cancer incidence and mortality rates, official rates tend to be underestimated because many health registries do not accurately code race. Using record linkages between the Northwest Tribal Registry and state health registries, the Northwest Tribal Registry showed that the true incidence of cancer among its tribal members was 267.5 per 100,000 population rather than 153.5 per 100,000 as previously reported. These more accurate data gave the board the factual support it needed in arguing for additional cancer control resources. (www.npaihb.org/cancer/ntccp.html)

Conducting Evaluation

Stakeholders should be involved in the entire evaluation process, including describing program processes and defining program activities and expected results. By collaborating to define specific activities and the results they should achieve, partners will have a common basis for understanding evaluation plans, activities, and results.

Evaluations should include both quantitative and qualitative measures and should address short-term, intermediate, and long-term outcomes. The planning group should build evaluation processes into the program itself rather than consider evaluation activities as separate from program activities and should identify resources necessary for evaluation early in the planning process. Some health agencies have in-house evaluation staff, while others obtain help from partners or through contracts with local colleges or universities. The Community Toolbox (www.ctb.lsi.ukans.edu) is another resource that can help health agencies monitor their comprehensive cancer prevention and control activities.

CDC recommends that comprehensive cancer control programs monitor the cancer-related indicators defined in *Indicators for Chronic Disease Surveillance: Consensus of CSTE, ASTCDPD, and CDC*, which is available at www.cste.org. These indicators provide a common set of measures for chronic disease surveillance that program planners can use to establish priorities and implement surveillance activities consistent with those in other jurisdictions.

Contained in this consensus document are surveillance indicators specific to cancer. These indicators include the incidence and rate of death attributable to the following types of cancer: lung, colon/rectum, female breast, prostate, cervix, bladder (in situ included), melanoma, and oral cavity/pharynx, as well as overall rates for all types combined. The document also includes indicators related to screening for colorectal, cervical, and female breast cancers. These indicators closely mirror several of the *Healthy People 2010* objectives.

Evaluation questions should be designed to identify those issues most pertinent to stakeholders. Care should be taken to select questions that can be readily answered with available evaluation resources. Examples of evaluation questions that can be asked at different stages in an evaluation process are shown in Table 2.

Partnerships

To create a fully comprehensive approach to cancer prevention and control, organizations must work synergistically with others involved with similar activities. Collaboration is key to a comprehensive effort.

In most of the examples presented in this section, health department staff serve as core members of comprehensive cancer control programs; however, the staffing pattern can vary, as can the "lead" responsibility for the program. Participating organizations can work semi-independently to implement plan activities as long as they keep the planning group (and thus other participating organizations) informed of what they are doing.

Comprehensive Cancer Control Programs in Action—Michigan: Comprehensive cancer control in Michigan is guided by the Michigan Cancer Consortium, an advisory body to the state health department and to all other cancer control players in the state. The consortium, which includes cancer experts and other representatives from more than 70 member organizations, provides leadership for decision-making and a forum to coordinate achievement of priority objectives in its comprehensive state plan. The representatives from these agencies are often in a position to influence cancer control policy within their own organization as well as within the consortium. (www.michigan.gov/documents/MCCIPlan_6718_7.pdf; www.michigan.gov/mdch/0,1607,7-132-2940_2955_2975-13561--,00.html#priorities)

Table 2. Sample Evaluation Questions for Comprehensive Cancer Control

Evaluation Level	Evaluation Questions
Process Evaluation of Program	• Is the comprehensive cancer control process working well? Are members satisfied with the process? Are planning tasks being accomplished and are planning products being produced in a timely manner?
Outcome Evaluation of Program	• Are the partnership's overarching goals and objectives being achieved? Is infrastructure for cancer control being enhanced? Is support for the initiative being mobilized? Are data and research being utilized? Are partnerships being built? Is the cancer burden being assessed? Addressed? Are the planning process and outcomes being evaluated?
Process Evaluation of Plan	• Are strategies proposed in the plan being implemented? Are knowledge gaps being addressed through surveillance and research? • Are interventions being delivered— To subpopulations with high risk and high burden? In a culturally appropriate manner? In a timely manner? In a cost effective manner? • Are implementation difficulties being successfully overcome?
Outcome Evaluation of Plan	• Are the outcomes anticipated by the partnership for each strategy being achieved? Has the baseline problem status identified by partners improved? Have intermediate measures of behavior such as cancer screening rates or rates of various risk behaviors changed? Over time, has cancer incidence, morbidity, and mortality from cancer decreased? Over time, have health disparities related to cancer among subpopulations decreased?

Source: Adapted from CDC's *Guidance for Comprehensive Cancer Control Planning.* (Avalable at www.cdc.gov/cancer/ncccp/index.htm.)

Early in the planning process, health departments should identify and solicit the help of partners able to support their efforts. Possible partners include

- Representatives of organizations likely to implement plan strategies.
- Legislators who can provide political and legislative support.
- Representatives of priority populations who can suggest health-promoting strategies and interventions appropriate for those populations.
- Representatives of organizations that may be able to fund activities or that will be doing similar activities under other sponsorship.

To reach specific priority populations, cancer control programs should also seek community partners who can help them create culturally sensitive messages and programs.

Comprehensive Cancer Control Programs in Action—West Virginia: As an initial step in the planning process to establish a comprehensive cancer control program in West Virginia, representatives of four founding organizations (the West Virginia Breast and Cervical Cancer Screening Program, the Office of Epidemiology and Health Promotion in the West Virginia Bureau of Public Health, The American Cancer Society's Mid-Atlantic Division, and the Mary Babb Randolph Cancer Center of West Virginia University) began efforts to promote the concept of comprehensive cancer control and to generate interest from a diverse group of potential coalition stakeholders. Now, more than 120 individuals and organizations make up the membership of Mountains of Hope, the state's comprehensive cancer control coalition. (www.cdc.gov/cancer/ncccp/contacts/wv.htm)

As comprehensive cancer control projects move from the planning stage to the implementation stage, what might have begun as a loose network of organizations and individuals should be forged into a fully functioning collaborative capable of significant advocacy, coordination, and action. To ensure the continued involvement of committed partners, project leaders should work to identify and recruit new partners, involve partners in decision-making processes and planning activities, and regularly assess the satisfaction and commitment of partners.

Samples of state-developed tools, including a planning meeting invitation letter and registration form, a partner interest survey and commitment form, a partner questionnaire, and a proposed process for creating a comprehensive cancer control plan can be found in CDC's *Guidance for Comprehensive Cancer Control Planning* (www.cdc.gov/cancer/ncccp/index.htm).

Comprehensive Cancer Control Programs in Action—Colorado: In June 2001, Colorado launched a public education campaign that included a special brochure, "Sun Smart Tips." The goal of this campaign was to educate visitors to Colorado's state and national parks about the need to protect themselves from the damaging rays of the sun. This campaign resulted from a unique partnership among national park officials and the state health department. Working together, Colorado's Comprehensive Cancer Prevention and Control Program, the Mesa Verde National Park, and park concessioners educated Colorado residents, as well as visitors from all over the world, about the easy steps they can take to prevent skin cancer. (www.cdphe.state.co.us/pp/ccpc/CancerPlan.pdf)

Communications

A solid health communications strategy is essential to successful interventions. For comprehensive cancer control, this strategy should entail an integrated and coordinated approach to educating the public, government leaders, health care providers, and others about cancer and its risk factors and how best to prevent, detect, and treat the disease. Health

communication strategies should be coordinated as much as possible with other program initiatives such as improving health care service delivery and creating supportive public policies.

Because everyone is at risk for cancer, cancer messages are needed for all population groups. However, each message should be tailored for a specific, targeted audience (e.g., people with a certain form of cancer, members of a specific racial or ethnic group, members of professional and health organizations). Messages should be accurate, use consistent terminology, and describe what people can do to help reduce their risk for cancer, detect it in its early stages, and obtain appropriate treatment if cancer is diagnosed.

Health communication activities should be part of a larger plan to address factors affecting behavior (e.g., social norms, governmental policies). In developing their communication plan, states should

- Identify and define the health problem they want to address.
- Incorporate an evaluation component into the communication plan.
- Be culturally sensitive in developing strategies and messages, conducting research, and implementing and evaluating communication efforts.
- Ensure that the targeted audience receives a single, simple, specific, and consistent message.
- Conduct qualitative and quantitative audience research to help understand how the audience perceives concepts and to determine their willingness and ability to do what is being asked. In addition to conducting formative research and pre-testing concepts and messages, health communicators should monitor the effectiveness of the communication campaign itself.
- Examine the wide range of actual and perceived barriers to and incentives for healthy (and unhealthy) behaviors and address them. Social marketing provides a useful framework for thinking about how to make behavior change easier.

Members of partner organizations often participate in important work groups. Following are three examples of how work groups have contributed to state cancer control efforts:

Comprehensive Cancer Control Programs in Action—Arkansas: In Arkansas, work groups were organized around the structure of the state cancer control plan. Three separate groups each developed a chapter for the plan: these chapters included an introduction on cancer in the state, a background section containing in-depth statistics, and a chapter on strategic options. Other work groups included an implementation team (which will become more active as the plan is finished), an evaluation team, and a communication team. (www.healthyarkansas.com/disease/cancerplan.pdf)

Comprehensive Cancer Control Programs in Action—Kansas: In Kansas, cancer site-specific work groups developed priorities for breast, cervical, skin, colorectal, prostate, and lung cancers. In addition, two crosscutting work groups developed priorities in the areas of cross-cultural competency and rehabilitation and pain. (www.cdc.gov/cancer/ncccp/contacts/ks.htm)

Comprehensive Cancer Control Programs in Action—Maine: Maine provided its work group members with both surveillance data and research literature to help them develop evidence-based goals, objectives, and strategies for the state's comprehensive cancer control plan. At least one member organization of the work group had to commit to a goal and its related objectives before the goal could become part of the plan. The Maine plan contains 18 goals and about 100 related objectives, each with multiple related strategies, and each with an organization accepting responsibility for its implementation. (www.cdc.gov/cancer/ncccp/contacts/me.htm)

- Devise health communication messages capable of competing effectively against possibly conflicting "unhealthy" messages that people may receive from other sources, including advertisers, the music and entertainment industry, and family and friends.

Professional Development, Training, and Technical Assistance

Comprehensive cancer prevention and control requires public health workers and health care providers to develop skills such as strategic planning and partnership building not usually considered necessary for their professions. To help them develop these skills, CDC offers professional development training for each group. For example, to help public health workers develop the skills necessary to lead comprehensive cancer control efforts, CDC has partnered with various other organizations to create "Working Together for Comprehensive Cancer Control: An Institute for State Leaders," a 2-day program attended by teams of 5 to 10 leaders from multiple states. The program includes presentations in various areas related to comprehensive cancer control and gives participants a chance to share their experiences with participants from other states as well as engage in team-specific assessment, feedback, and planning activities. Each session is tailored to the specific needs of the participants. The goal of the institute is for participants to implement a strategic action plan within the following year that will further the implementation of comprehensive cancer control.

CDC has also developed several resources to help health care providers prevent, detect, and treat cancer in their patients. These include

- *A Call to Action: Prevention and Early Detection of Colorectal Cancer.* This training program for primary care providers is available at www.cdc.gov/cancer/colorctl/calltoaction/index.htm.
- *Guidance for Breast Cancer Screening Follow-Up.* This resource, a self-study packet which includes a videotape, is designed to help clinicians, particularly those in rural areas, provide better follow-up care or referrals for women who have abnormal breast cancer screening results. (The packet is expected to be available in 2003.)

Funding

At a minimum, a comprehensive cancer prevention and control program needs sufficient funds to support a core infrastructure for planning activities. This core infrastructure should include

- At least one full-time staff person.
- Adequate facilities, equipment, supplies, and support (especially computer support).
- Capacity to conduct data analysis.
- Sufficient funds to support travel throughout the state.
- Sufficient funds to hold regular partnership meetings.
- Sufficient funds to plan, print, and distribute the comprehensive cancer control plan.

Comprehensive Cancer Control Programs in Action—Michigan: As of 2001, the Michigan Cancer Consortium (MCC) had 14 full-time employees from the state health agency working on the statewide Comprehensive Cancer Initiative. In 1998, the state provided approximately $1.3 million to support the initiative. In 1998, MCC volunteers and their employers donated 460 hours during the planning process. In 2001 (year 3 of implementation), MCC volunteers and their organizations reported contributing more than 730,000 hours toward the achievement of the 10 MCC priorities and $27 million in staff and other resources. (www.michigan.gov/documents/MCCIPlan_6718_7.pdf; www.michigan.gov/mdch/0,1607,7-132-2940_2955_2975-13561--,00.html#priorities)

CDC estimates that states will need at least $150,000 per year (or its equivalent in a combination of cash and donated services) to

establish this planning infrastructure. In addition, states should anticipate higher infrastructure costs as they incorporate specific cancer areas (e.g., breast, cervical, prostate, colorectal, or skin cancers) or cancer issues (e.g., pain management, data deficits) into their comprehensive cancer control approach.

Comprehensive Cancer Control Programs in Action—Georgia: Georgia used money from the 1998 tobacco settlement and other sources to fund the creation of a nationally recognized strategic plan for the Georgia Cancer Coalition (GCC). State support for the GCC is expected to total several hundred million dollars over the next 5 to 7 years. The governor has issued a challenge to stakeholders to leverage this amount threefold, resulting in a total investment of $1 billion. The GCC will employ a small staff to coordinate GCC initiatives and monitor their progress. It will also continue to solicit funds to support the work of partnering hospitals, nonprofit organizations, and educational institutions, as well as various research initiatives. (www.ph.dhr.state.ga.us/programs/cancer/index.shtm)

The actual implementation of a comprehensive cancer control plan involves even more complicated funding variables, and total costs depend on the extent to which site-specific or risk-factor-specific interventions are included and on the type of interventions used. For example, a media campaign is much more costly than in-service training for health care providers. CDC estimates that the cost of implementing a comprehensive approach to cancer prevention and control ranges from $250,000 to $1,000,000 per year.

The cost of a cancer screening program is a function of the cost of the services provided and the number of people screened. Typical annual costs for breast and cervical cancer screening range from $200,000–$300,000 for small programs that screen 1,000 women annually to $3.5–$6 million for larger programs that screen 18,000–25,000 women annually. The cost of a cancer registry program typically ranges from $13–$150 per case identified.

National Leadership

CDC's Division of Cancer Prevention and Control (DCPC) is a leader in nationwide cancer prevention and control and works with national organizations, state health agencies, and other key stakeholders to develop, implement, and promote effective cancer prevention and control practices. DCPC supports seven initiatives:

- National Comprehensive Cancer Control Program
- National Breast and Cervical Cancer Early Detection Program
- National Program of Cancer Registries
- Colorectal Cancer Prevention and Control Initiatives
- Prostate Cancer Control Initiatives
- Skin Cancer Primary Prevention Education Initiatives
- Ovarian Cancer Control Initiative

More information about these programs and initiatives is available at www.cdc.gov/cancer.

In 2000, DCPC began work with the National Dialogue on Cancer (www.ndoc.org) and partner organizations such as the American Cancer Society (www.cancer.org), the National Cancer Institute (www.nci.nih.gov), and the National Governor's Association (www.nga.org) to accelerate the development and implementation of comprehensive cancer control plans at the state, tribal, and territory level. These plans are to be based on research data and stakeholder input and must establish clear lines of responsibility and accountability. DCPC's goal is for all states to produce comprehensive cancer control plans by 2005.

National Partnerships

DCPC partners with other entities within CDC, with other governmental agencies such as NCI, with private nonprofit organizations such as the American

Cancer Society (ACS), and with public health organizations such as the Chronic Disease Directors (www.chronicdisease.org).

CDC's Office on Smoking and Health (www.cdc.gov/tobacco), its Division of Nutrition and Physical Activity (www.cdc.gov/nccdphp/dnpa), its Division of Adolescent and School Health (www.cdc.gov/nccdphp/dash), and many other CDC centers, institutes, and offices conduct work relevant to cancer control. For example, the mission of CDC's National Center for Environmental Health (www.cdc.gov/nceh/default.htm) is to prevent illness, disability, and death from interactions between people and the environment by conducting research to investigate the effects of the environment on health. CDC's National Institute for Occupational Safety and Health (www.cdc.gov/niosh/homepage.html) conducts research and makes recommendations aimed at preventing work-related illnesses and injuries.

NCI provides cancer information through publications, reports, and its toll-free Cancer Information Service (1-800-4-CANCER). NCI also provides grant funds, supports training programs for health professionals, and partners with other academic and national organizations on projects related to cancer prevention and control.

The American Cancer Society is a nationwide community-based voluntary health organization dedicated to eliminating cancer as a major health problem by preventing cancer, saving lives, and diminishing suffering from cancer through research, education, advocacy, and service. It includes chartered divisions throughout the country and over 3,400 local units.

Technical Resources

Several national public health organizations offer training and technical assistance in cancer surveillance, research, and intervention. The Web sites of NCI (www.nci.nih.gov) and ACS (www.cancer.org) are particularly good sources of information and materials on various forms of cancer and related issues.

Other CDC cancer-related resources include

- A cancer-related Web site (www.cdc.gov/cancer).
- E-mail service for public inquiries (cancerinfo@cdc.gov).
- Numerous cancer-related publications and materials that can be accessed at www.cdc.gov/cancer/publica.htm.

In addition, resources specific to comprehensive cancer control can be located at www.cdc.gov/cancer/ncccp. They include the following:

- Journal articles that provide a conceptual foundation for comprehensive cancer control.
- A guidance document and toolkit on comprehensive cancer control planning.
- A report outlining essential elements for developing comprehensive cancer control programs.
- A network of state and tribal comprehensive cancer control contacts.
- A toll-free telephone number (1-888-842-6355) for additional information.

Progress to Date and Challenges Ahead

Building scientific and programmatic capacity in state, territorial, and tribal health agencies to provide a foundation for future cancer prevention and control efforts is an ongoing challenge. CDC strives to meet this challenge by providing resources and support to public health agencies through programs such as the National Breast and Cervical Cancer Early Detection Program, which is in its 12th year.

CDC recently released a consolidated program announcement that included funding for additional comprehensive cancer control programs. This funding mechanism, which consolidated the National Comprehensive Cancer Control Program (NCCCP), the National Program of Cancer Registries, and the National Breast and Cervical Cancer Early Detection Program, is a first step toward integrating support for cancer-related programs.

As of November 2002, CDC supported 27 states and 1 tribal organization in their efforts to create or implement comprehensive cancer control plans and programs through the NCCCP. A key challenge in the future will be to evaluate the impact of these programs and the value-added benefits of a comprehensive approach to cancer prevention and control. CDC will continue to address this and other challenges by

- Expanding national partnership activities.
- Conducting research to determine how best to implement comprehensive cancer control plans and programs.
- Providing ongoing technical assistance.
- Addressing implementation challenges by providing training and resources to leaders of comprehensive cancer control programs.
- Evaluating the impact of comprehensive cancer control efforts.
- Expanding the NCCCP to include more states, territories, and tribes, as funding allows.

Enhancing surveillance systems to help strengthen the foundation upon which cancer prevention and control activities are based is a priority. In November 2002, CDC released *United States Cancer Statistics: 1999 Incidence* (available at www.cdc.gov/cancer/npcr). This report, a joint publication of CDC and NCI in collaboration with the North American Association of Central Cancer Registries, contains the first set of official cancer incidence statistics from states that meet high-quality data standards. Two federal programs support population-based cancer registries in the United States: CDC's National Program of Cancer Registries and NCI's Surveillance, Epidemiology, and End Results (SEER) Program. The report contains statistics on more than 1 million invasive cancer cases diagnosed during 1999 in residents of 37 states, 6 metropolitan areas, and the District of Columbia—geographic areas in which approximately 78% of the U.S. population resides. Using these data to further plan, develop, and evaluate comprehensive cancer programs is both an opportunity and a challenge for state, territorial, tribal and local health departments and their partners, including CDC.

The ultimate goal of comprehensive cancer control is to serve the public more effectively and more efficiently by coordinating all cancer control efforts. To achieve this goal, public health leaders must accept the opportunity and the responsibility to address cancer prevention and control from a broader perspective. CDC will continue to work with state, tribal, and territory leaders and national organizations to make programs available in every state to address death and disability from cancer and its principle risk factors.

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Targeting Arthritis: The Nation's Leading Cause of Disability

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Targeting Arthritis: The Nation's Leading Cause of Disability

Jeffrey J. Sacks, MD, MPH, and Joseph E. Sniezek, MD, MPH

Introduction

The development and publication of the *National Arthritis Action Plan: A Public Health Strategy* (NAAP) catalyzed the public health system's interest in arthritis and emphasized population-based approaches. These approaches complement medical interventions to address arthritis at the individual patient level. Before the NAAP was published, few state health departments addressed arthritis. CDC's Arthritis Program, initiated after Congressional appropriations in fiscal year 1999, focuses on building a coordinated public health response to arthritis. A major part of this effort is to help develop state arthritis programs. In 2002, CDC is funding 36 state health departments to establish and enhance public health activities for arthritis, the nation's leading cause of disability.

The Burden of Arthritis

Arthritis encompasses more than 100 diseases and conditions that affect joints and connective tissues. Because of varying case definitions, different surveys produce different estimates of prevalence, but all confirm that arthritis is one of the most common diseases in the United States. According to the National Health Interview Survey (NHIS), arthritis affects nearly one of every six Americans.[1] Projections from these data indicate that, by 2020, an estimated 60 million people will be affected.[1, 2] Other surveys show that arthritis is the nation's leading cause of disability, limiting daily activities for more than 7 million Americans.[3]

Although all Americans are at risk for arthritis, the risk for this disease rises dramatically with age and is higher among women than men (Table 1).[1, 2, 4, 5] Indeed, over half of all people older than 65 have arthritis.[1,2] Surveys differ on the overall prevalence of arthritis and the prevalence by race and ethnic group. Data from the state-based Behavioral Risk Factor Surveillance System (BRFSS) indicate a higher prevalence of arthritis than do NHIS data. BRFSS data also suggest large racial and ethnic differences in prevalence (Table 1). However, according to the NHIS,[6] the self-reported prevalence of arthritis and other rheumatic conditions is similar among whites (15.5%) and blacks (15.4%), but activity limitations due to arthritis are more common among blacks (3.9%) than among whites (2.7%). Although Hispanics report a much lower prevalence of arthritis (11.2%), the proportion who have activity limitations due to arthritis is the same as that of whites (2.7%). Asians/Pacific Islanders also have a much lower prevalence of arthritis (7.2%), but a correspondingly lower proportion (1.1%) report arthritis-related activity limitations. The reasons for these racial/ethnic differences are not yet explained; some may result from different case definitions of arthritis and different methods used in the different surveys.

People with arthritis are often more vulnerable to stress, depression, anger, and anxiety because of pain, loss of functional ability, and fewer social contacts. Because of joint pain, people with arthritis may also be less physically active, placing them at higher risk for obesity, heart disease, diabetes, and high blood pressure. Compounding this picture are the enormous costs of treating arthritis and its attendant disability. These medical and social costs total almost $65 billion; the medical costs alone are $15 billion.[7]

Table 1. Prevalence of arthritis among adults by selected characteristics—Behavioral Risk Factor Surveillance System, United States, 2001

	Arthritis Prevalence		
Characteristic	Percentage	95% Confidence Interval	Estimated No. (1000s)
Total	33.0	(32.7–33.4)	69,934
Age Group			
18–44	19.0	(18.5–19.4)	20,610
45–64	42.1	(41.5–42.8)	27,112
65+	58.8	(58.0–59.7)	21,704
Sex			
Male	28.4	(27.9–28.9)	28,926
Female	37.3	(36.9–37.8)	41,008
Race/ethnicity			
White, non-Hispanic	35.3	(34.9–35.7)	53,247
Black, non-Hispanic	31.5	(30.3–32.6)	6,330
Hispanic	23.3	(21.9–24.7)	5,796
Other	27.8	(26.2–29.3)	3,798

Source: Bolen J, Helmick CG, Sacks JJ, Langmaid G. Prevalence of self-reported arthritis or chronic joint symptoms among adults—United States, 2001. *MMWR* 2002;51(42):948-50.

The vision of CDC's Arthritis Program is to decrease pain and activity limitation and improve the quality of life for people with arthritis.

Healthy People 2010 Objectives

The *Healthy People* series provides a set of national health priorities every 10 years.[8] Because of the magnitude of the burden of arthritis and the relationship of arthritis-related physical inactivity to other diseases, *Healthy People 2010* sets forth a number of arthritis-related objectives. The following objectives are directly related to arthritis:

- Increase the mean number of days without severe pain among adults who have chronic joint symptoms (2-1).
- Reduce the proportion of adults with chronic joint symptoms who experience a limitation in activity due to arthritis (2-2).
- Reduce the proportion of all adults with chronic joint symptoms who have difficulty in performing two or more personal care activities, thereby preserving independence (2-3).
- Increase the proportion of adults with arthritis who seek help in coping if they experience personal and emotional problems (2-4).
- Increase the employment rate among adults with arthritis in the working-age population (2-5).
- Eliminate racial disparities in the rate of total knee replacements (2-6).
- Increase the proportion of adults who have seen a health care provider for their chronic joint symptoms (2-7).
- Increase the proportion of people with arthritis who have had effective, evidence-based arthritis education as an integral part of the management of their condition (2-8).

The following objectives are indirectly related to arthritis:

- Increase the proportion of adults who are at a healthy weight (19-1).
- Reduce the proportion of adults who are obese (19-2).
- Reduce the proportion of adults who engage in no leisure-time physical activity (22-1).
- Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day (22-2).
- Increase the proportion of adults who engage in vigorous physical activity that promotes the development and maintenance of cardio-respiratory fitness 3 or more days per week for 20 or more minutes per occasion (22-3).
- Increase the proportion of adults who perform physical activities that enhance and maintain muscular strength and endurance (22-4).
- Increase the proportion of adults who perform physical activities that enhance and maintain flexibility (22-5).

Prevention Opportunities

Fortunately, much can be done to lessen the burden of arthritis and to meet *Healthy People 2010* objectives. Preventive strategies, the traditional focus of public health programs, can be *primary* (preventing arthritis from occurring), *secondary* (e.g., emphasizing early diagnosis and appropriate management), *tertiary* (e.g., increasing self-management activities to lessen pain and activity limitations), or some combination of the three. Currently, few primary prevention measures exist for arthritis, and effective secondary and tertiary prevention strategies are underused.

Primary Prevention

Being overweight is associated with increased risk for arthritis in general. In particular, weight loss reduces one's risk for osteoarthritis of the knee.[9] Physical activity not only helps prevent obesity but also maintains joint health and reduces one's risk for premature death, heart disease, and diabetes. Proper warm-up routines, strengthening exercises, and the use of appropriate protective equipment during physical activity can prevent traumatic injuries that may result in arthritis. Occupational injury prevention programs, especially those that reduce repetitive joint stresses, can also decrease the risk for arthritis.

Secondary Prevention

Early diagnosis and appropriate management of arthritis can be very beneficial, especially for people with inflammatory arthritis.[10] Early use of disease-modifying drugs (e.g., methotrexate for rheumatoid arthritis) can profoundly affect the course of some forms of arthritis by reducing joint destruction and improving long-term outcomes.[11] Some drugs can prevent exacerbations of arthritis; for example, drugs to control uric acid levels can help prevent attacks of gout.[10] Anti-inflammatory medications can help relieve pain and improve functionality.

Tertiary Prevention

Although joint replacement surgery is highly effective for reducing pain and improving functionality,[10] several nonsurgical strategies can reduce pain and disability, increase a person's sense of control, and improve the quality of life. The cornerstones of these strategies are *physical activity*, *weight control*, and *self-management education programs*.

Physical Activity

- An exercise program can improve aerobic capacity and lessen depression and anxiety among people with arthritis.[12-15]
- Regular exercise reduces pain and improves physical performance among older people with disabling osteoarthritis of the knee.[16, 17]
- PACE (People with Arthritis Can Exercise) is a community-based recreational exercise program in which trained instructors cover a variety of endurance-building activities, games, relaxation techniques, and health education topics. The program's demonstrated benefits include improved functional ability, decreased depression, and

increased confidence in one's ability to exercise (see www.arthritis.org/events/getinvolved/ProgramsServices/PACE.asp).[18]

Weight Control

- A randomized controlled study among women showed that the amount of weight lost was strongly correlated with improvements in signs and symptoms of knee osteoarthritis.[19]

Self-Management Education Programs

- The **Arthritis Self-Help Course** (ASHC) is an effective self-management education intervention for people with arthritis. The 6-week course consists of weekly 2-hour sessions guided by two trained instructors who follow a detailed protocol. Developed in the early 1980s at Stanford University and currently sponsored by the Arthritis Foundation, the ASHC reduces arthritis-related pain by 20%. By reducing physician visits by 40%, it also reduces overall health care costs, making it a highly cost-effective public health intervention (see www.arthritis.org/events/getinvolved/ProgramsServices/ArthritisSelfHelp.asp).[20, 21]
- **Arthritis Home Help Program,** a mail-delivered arthritis home study program, takes an individualized approach to developing self-care skills. Benefits include improvements in joint pain, mobility, and ability to communicate with physicians (see www.healthtrac.com/index.tam?Tame?SwitchTo=studies-pe-8).[22]
- **Arthritis phone service interventions** consist of initial telephone contact and follow-up by trained, nonmedical personnel who provide information, referral, and problem-solving strategies. People with osteoarthritis, rheumatoid arthritis, and lupus have shown improvements in physical and psychological health and pain as a result of these interventions.[23, 24]

More prevention research is needed to evaluate the effectiveness and cost-effectiveness of existing programs and community strategies, to develop new strategies to encourage people with arthritis to participate in self-management programs, and to develop new cost-effective self-management strategies. To be broadly effective, these strategies need to be adaptable to the needs of different age and racial/ethnic groups.

The National Arthritis Action Plan

To address this enormous health problem and promote the widespread use of these proven interventions, a national strategy was developed under the leadership of the Arthritis Foundation, the Association of State and Territorial Health Officials, and CDC and released in 1998 (see www.cdc.gov/nccdphp/arthritis/index.htm).[25] The NAAP represents the work of nearly 90 organizations, including governmental agencies, voluntary organizations, academic institutions, community interest groups, professional associations, and others with an interest in arthritis prevention and control. The NAAP focuses on three strategic areas to reduce the prevalence of arthritis and accompanying disability:

- Surveillance, epidemiology, and prevention research.
- Communications and education.
- Programs, policies, and systems.

The goals of the plan include increasing public awareness of arthritis as an important public health problem, preventing arthritis, promoting early diagnosis and appropriate management, minimizing preventable pain and disability, providing resources for coping with arthritis, and ensuring that people with arthritis receive the support they need. A major recommendation for accomplishing these goals is to build the capacity for supporting arthritis programs into the public health infrastructure.

National Leadership

Following the release of the NAAP, Congress, for the first time, appropriated funds in fiscal year 1999 for CDC to initiate a public health response to arthritis. The CDC Arthritis Program is working to develop an integrated public health approach to both monitor the burden of arthritis and foster programs

to reduce that burden. The core activities of the resulting CDC Arthritis Program focus on three key areas:

- *Strengthening the Arthritis Public Health Science Base*

  Consistent with the goals of the NAAP, CDC's public health science activities focus on surveillance, epidemiology, and prevention research. Working with state Arthritis Program partners and others, CDC revised surveillance methods used to estimate the burden of arthritis. This revision included establishing a uniform case definition, revamping arthritis surveillance questions, and ensuring that identical arthritis questions are used in the NHIS (used for national prevalence estimates) and the BRFSS (used for state-level estimates). CDC also funds a variety of extramural prevention research projects to strengthen the science base for arthritis.
- *State Arthritis Programs*

  In 1999, CDC funded the development of arthritis programs in 37 states. By 2002, 28 states were funded at an average level of $120,000 to establish the basic public health foundation necessary to support a state arthritis program and initiate at least one community-based intervention program. Eight states were funded at an average level of $320,000 to further strengthen their public health infrastructure for arthritis intervention activities.
- *Intervention Activities*

  The CDC Arthritis Program plays a key role in implementing the NAAP by developing and supporting health communications, health education, and health care system interventions to be used by state programs and their partners to address arthritis.

CDC is only one of many agencies working to achieve the goals of the NAAP. CDC's work complements the work of others such as the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) (see www.niams.nih.gov/an/index.htm) and the Arthritis Foundation (AF) (see www.arthritis.org). NIAMS supports research into the causes, treatment, and prevention of arthritis and musculoskeletal and skin diseases, trains basic and clinical scientists to carry out this research, and disseminates information on the progress of research into these diseases. The AF provides information and self-management services to people with arthritis and their families.

Infrastructure to Support State Programs

Program Management and Administration

A strong system of management, staff, and support is necessary to effectively address arthritis at the state level. An arthritis program in a state health department should have the following competencies and capacities:

- Leadership for overall program coordination and implementation.
- Surveillance and data collection and analysis to assess the burden of arthritis, arthritis-related disability, risk factors, and policy and program functions.
- Appropriate staff with defined lines of authority.
- A partnership or advisory committee.
- Health communications activities.
- Implementation expertise and services to provide appropriate support for community-based intervention programs.
- Policy support for arthritis program activities.
- Accountability to ensure that programs are implemented with integrity and evaluated for effectiveness.

Ideally, the program should be organizationally located in an area with easy access to partner programs such as those addressing physical activity, aging, injury control, and obesity prevention. Partnerships, especially with the AF, will be needed. Other agencies interested in arthritis should also be sought out as partners.

Programmatic Focus

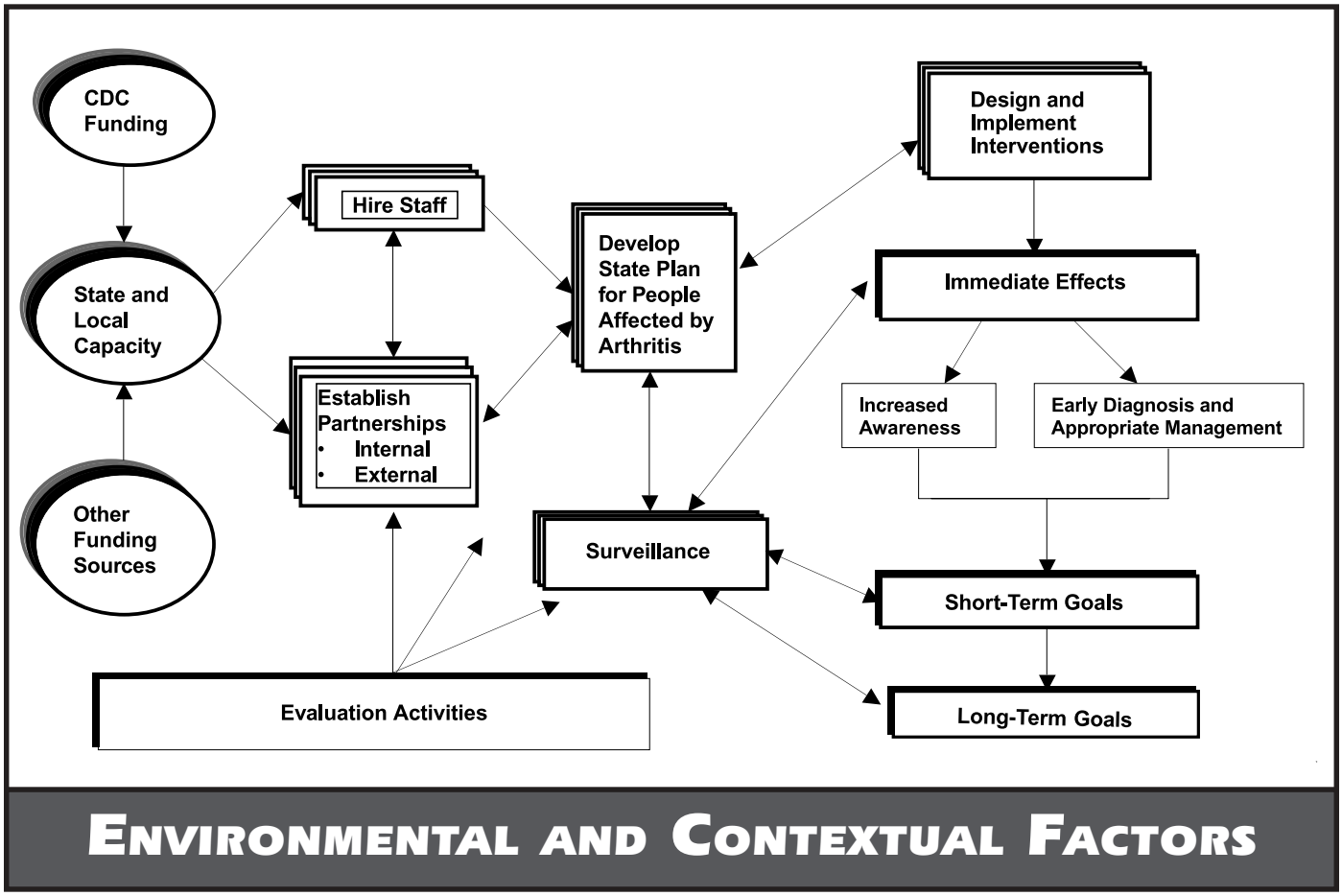
Because of typically limited resources for early program efforts and the existence of other programs addressing risk factors for some types of arthritis (e.g., weight control and injury prevention for osteoarthritis), we recommend that initial state program efforts focus on people already experiencing the pain and disability associated with arthritis, their families, health care providers, and others treating or providing services for people with arthritis. These secondary and tertiary interventions targeting people with arthritis can have immediate effects on disability and improve quality of life.

The implications of this recommended focus are that successful programs aim to increase early diagnosis and appropriate management of arthritis; increase self-management of arthritis; and, ultimately, decrease pain and disability and improve quality of life. Accordingly, these programs must promote

- Awareness of the signs, symptoms, and options for management of arthritis.
- Awareness of the need for early diagnosis and appropriate management.
- Self-management as part of routine medical care for arthritis.
- Participation in self-management programs.

To accomplish these ends, we recommend that a state program have 1) a well-thought-out plan of action, 2) appropriate partnerships, 3) surveillance

Figure 1. CDC-State Arthritis Programs: A Revised Public Health Framework



systems with arthritis-specific capability, 4) the ability to implement interventions, and 5) evaluation capability (Figure 1).

State Plans

A state arthritis plan is a plan developed by partners to decrease the burden of arthritis in the state. It describes a shared vision and details a well-thought-out plan of action for what needs to be done by the many partners concerned about arthritis. To a large extent, the process of developing a state plan serves as a catalyst to develop and strengthen partnerships, explore resources and identify gaps, secure commitments from partners to take responsibility for specific functions or services, and clearly articulate a common vision for how a state arthritis program will evolve.

Ideally in alignment with *Healthy People 2010* and the NAAP objectives, a state plan should be a dynamic document that includes plans for periodic updates and uses the most current data. States should have a clear approach for disseminating the plan, including such issues as who the plan's target audiences are and how they will be made aware of the plan. The CDC-recommended components of a state arthritis plan include the following:

- *Burden.* Describe the burden and impact of arthritis in the state using the best available data. Use state-specific data if possible. Update as new data become available.
- *Lessening the burden.* Describe what could be done better in the state to decrease the burden of arthritis. Making this case clearly may help influence policy makers and other potential partners to support the plan. Delineate the role of public health agencies and other partners in lessening the burden.
- *Existing capacity.* Describe current resources and resource gaps in the health department and among partners. Because plans need to consider the state's unique environmental and contextual factors (e.g., the availability of self-management courses, awareness of these programs and ease of accessing them, relationships among health systems in the state, and population insurance coverage), a needs assessment is necessary to identify current resources and gaps for all partners, including the health department.
- *Core capacities and functions.* Describe the capacities and functions needed to conduct an arthritis program, including leadership for coordinating and implementing the program, staff requirements and organizational location, policy support, surveillance and data collection, partnerships, health communications, and accountability to ensure that programs are evaluated for effectiveness.
- *Objectives and activities.* Detail program goals and measurable objectives, and outline activities and strategies to achieve the objectives. Explain how the activities will achieve the intended outcome. For each objective and activity, describe the target population, the channel or venue to be used, the evaluation plan, the resources needed, the partners involved, and the staff required to conduct the activity and ensure that the objective is achieved. Because all objectives are unlikely to be immediately achievable with existing resources, a plan should specify the activities to be done first (the priorities) and those to be undertaken later.
- *Resources.* Estimate what resources and funds are needed for varying components of the plan and what is available (cash and in-kind).
- *Time line.* Provide a time line for implementing activities, given available resources. We recommend a 5-year time frame for the plan.

Examples of state plans can be found at www.cdc.gov/nccdphp/arthritis/states.htm.

The NAAP provides a broad framework for addressing arthritis from a public health perspective and may also provide a useful perspective for planning at the state and local level.

Partnerships

Addressing arthritis will require a shared vision and the coordinated work of multiple organizations, including governmental, public, and private organizations; public health, medical care, and social

A State Success Story: The Michigan State Plan Development

Michigan Arthritis Program staff asked its primary partners (the Arthritis Foundation Michigan Chapter and the University of Michigan Rheumatology Program) to identify knowledgeable and influential people to help develop an arthritis plan for the state. A 25-member steering group was then formed and began a four-step process.

Step 1: Discovery Meetings
Three regional meetings were held to get input. At each site, two local hosts (a public health agency and a hospital or health care organization) helped invite those with crucial perspectives—people with arthritis and agencies like the Detroit Parish Nurse Network, Senior Centers, Area Agencies on Aging, the Governor's Council on Physical Fitness, and local employers. Each attendee addressed three questions:

- What services are now available for people with arthritis?
- What problems do people with arthritis face?
- What could be done to address those problems?

Through news releases, Internet postings, and radio spots, the public was invited to give input.

Step 2: The Scientific Forum
National arthritis experts presented the latest research on arthritis at a forum and also commented on possible recommendations made during Step 1.

Step 3: Consensus and Public Comment
The steering committee reached consensus on the plan based on the public and expert input. A draft plan was made and subjected to public comment for a month, after which it was finalized.

Step 4: The Launch
The *Michigan Arthritis Action Plan* was launched at a well-attended press conference held at the state capitol. At this point, Michigan realized it had achieved three outcomes:

- It had a science-based plan that was really doable.
- There was an unprecedented level of awareness that arthritis was an issue needing to be addressed.
- Perhaps most importantly, it had a group of partners ready to dig in and get to work.

service agencies; and a variety of nontraditional partners. These multi-disciplinary partnerships should coordinate activities among public- and private-sector organizations and agencies to ensure a comprehensive approach to arthritis. Partners can work together to address barriers and gaps in service, identify where disparities exist and resources are lacking, generate advocacy and commitment to reduce the burden of arthritis, and identify and share effective strategies. The state health department should also work with academic institutions and other partners to ensure that the results of social, behavioral, and medical science research are translated into sound public health practice and that program interventions and evaluations are based on science. Because activities are conducted at the local

level, the involvement of local-level partners in generating the plan is critical to ensure that the planned activities will occur.

The following actions should help state health departments build and strengthen partnerships:

- Strengthen alliances among community organizations (e.g., health departments, Arthritis Foundation chapters, Medicaid agencies, voluntary health agencies, AARP, Area Agencies on Aging, senior centers, and faith communities).
- Establish arthritis advisory boards or incorporate arthritis into existing advisory boards with similar goals.
- Form alliances with organizations that focus on weight control and physical activity.
- Foster collaboration among employers and employer networks, their health plans, managed care organizations, and public health agencies.
- Form partnerships within the health department among programs (e.g., cardiovascular disease, diabetes, nutrition) that are addressing common risk factors (e.g., obesity, physical inactivity). Programs can develop these links through activities such as referring clients to other programs as appropriate (e.g., the arthritis program refers an obese client to the nutrition program), promoting other programs' messages and activities in printed materials, and combining approaches to external partners with the same interests, such as those involved in developing walkable communities to promote physical activity.
- Develop community and business coalitions and train members to promote and raise awareness of key arthritis issues.

Surveillance

Surveillance at the state level is essential for assessing the burden of arthritis; describing how arthritis affects various subpopulations; monitoring trends over time; and informing decision-making for targeting interventions, allocating resources, and shaping state health policy. Surveillance of arthritis in general involves two broad paradigms:

1) Self-reports take into account whether people have joint symptoms associated with arthritis or have been told by a physician that they have arthritis. The self-report of joint symptoms captures the large proportion of people who do not consult the health care system about these symptoms. Self-report of joint symptoms and/or physician diagnosis is used in the BRFSS to define a case of arthritis.
2) A *medical classification system* is applied to health care data (e.g., insurance claims, encounter data, hospitalizations, ambulatory care) that have diagnoses coded using the *International Classification of Diseases, Ninth Edition, Clinical Modification (ICD-9-CM)*. The National Arthritis Data Workgroup has developed a standard definition for arthritis using *ICD-9-CM* codes (see www.cdc.gov/nccdphp/arthritis).[2] Used with health care data systems based on *ICD-9-CM*, these arthritis codes can help to better define the burden of arthritis.

CDC recommends that each state directly gather data with the BRFSS modules on arthritis (six questions), health-related quality of life, physical activity, body mass index, and weight control practices. An optional four-question BRFSS arthritis module covers additional issues of programmatic importance (see www.cdc.gov/nccdphp/arthritis). Because so much of arthritis care occurs in ambulatory care settings or outside the medical care system altogether, we also recommend that, when possible, states supplement the BRFSS with additional state-based data from outpatient or ambulatory care settings, managed care organizations, and follow-back surveys of BRFSS respondents to acquire more detailed information. Pharmacy data may also prove useful to better define the burden of arthritis and how it is treated. Again, when possible, states should monitor trends in relevant *Healthy People 2010* arthritis objectives by adding questions to the BRFSS or special studies.

To allow states to gauge if their programs are achieving the desired effects, states would ideally also collect data on changes in the following:

- Awareness of the signs and symptoms of arthritis and the management options available.
- Awareness of the need for early diagnosis and appropriate management.
- Participation in arthritis self-management programs.
- Early diagnosis and appropriate management of joint symptoms and arthritis.
- Pain, disability, and quality of life among people with arthritis.
- Inclusion of self-management as part of routine medical care for arthritis.

A number of BRFSS-related measures generated from core and optional module questions can be used to track the progress and outcomes of the state arthritis program. Examples of such indicators include

- Mean reported healthy days among people with arthritis.
- Proportion of people with arthritis reporting limitations and the severity of these limitations.
- Proportion of working-age people with arthritis who are employed.
- Proportion of people with arthritis reporting that arthritis or joint symptoms affect their work.
- Proportion of people with chronic joint symptoms who have sought medical evaluation for the symptoms.
- Proportion of people with arthritis who report regular physical activity.
- Proportion of people with arthritis who are not overweight.
- Proportion of overweight people with arthritis reporting that their doctor advised them to lose weight.
- Proportion of people with arthritis who report ever having taken a class on arthritis self-management.
- Proportion of people with arthritis reporting that their doctor suggested physical activity to help their arthritis or joint symptoms.

Findings from surveillance should be routinely translated and communicated in easily understandable terms. Data should be quickly and routinely disseminated by creating "State of Arthritis" reports, and the data should be incorporated into ongoing updates of the state plan.

The ultimate goal of state arthritis surveillance is to define the burden of arthritis and other program-related factors in a manner that informs public health decision-making and programmatic direction. Achieving this goal requires that states allocate sufficient resources and staff time toward surveillance, data management, evaluation, planning, and other expenses associated with timely surveillance efforts. States also need to establish standards for data analysis and timely reporting and provide training and technical assistance on collecting, analyzing, and using data.

Interventions

Because the target population is people affected by arthritis, CDC recommends that states choose from the program components outlined on pages 3–4 that focus on secondary and tertiary levels of prevention. The pain and disability accompanying many types of arthritis may be minimized through early diagnosis and appropriate medical management, weight control, physical activity, appropriate self-management, physical and occupational therapy, and joint replacement surgery.

Community-Based Programs

At the community level, CDC recommends that state programs develop interventions to promote self-management among people with arthritis. Elements of successful approaches include the following:

- Use *Healthy People 2010* objectives on arthritis to establish community program goals.

- Target broad social and environmental changes to complement individual change.
- Encourage representatives of the target population to participate in program planning, design, implementation, and evaluation.
- Conduct community assessments to identify perceived arthritis needs and resources.
- Coordinate community resources and identify consistent, convincing, and scientifically sound arthritis messages delivered through health care services, places of worship, workplaces, media, and other pertinent channels.
- Increase the local availability of self-management classes and other tertiary prevention strategies, such as physical activity and weight control programs. (See Prevention Opportunities section, pages 5-3–5-5.) Coordinate these strategies with other health department programs targeting common risk factors.
- Promote physical activity as the social norm through community policy and environmental strategies and make opportunities for physical activity safe, accessible, fun, and supportive. (See Chapter 7 for detailed recommendations.)
- Target various subpopulations. Programs targeting the following subpopulations at higher risk for arthritis and limitations from arthritis are likely to be more cost effective than those targeting the community as a whole:
  - Women.
  - Minorities, particularly African Americans and Hispanics.
  - People with low levels of education and income.
  - Older adults.
- Develop community resource packages on how to promote early diagnosis and appropriate management (including self-management) of arthritis and how to delay arthritis-related disability.
- Educate private-sector business leaders on the costs and benefits of providing arthritis information and services to employees. For example, it might be cost-effective for a business to contract with a vendor to educate employees on arthritis self-management to reduce the work time lost due to sick leave. In addition, states may need to provide technical assistance to help employers who are purchasing health insurance coverage ensure that arthritis issues are included in the package of health care benefits.
- Train staff and volunteers from a variety of organizations.

State Arthritis Program in Action: Alabama

With CDC support, Alabama developed and is evaluating a community project in an underserved, rural African American community. This project involved the community in developing resources for arthritis, including the delivery of the Arthritis Self-Help Course (ASHC). This project found that delivering this course is feasible and seems effective in this community. Increased delivery of the ASHC to rural minority populations is likely to have significant health benefits. In addition, because of the partnerships developed through this program, a rheumatologist travels 2 hours from Birmingham once a month to offer specialized care for people with arthritis in this area.

Systems Changes

Because physical activity, weight control, and self-management programs are effective in alleviating arthritis pain and minimizing activity limitations, CDC recommends that state programs engage managed care and health care providers in routinely providing these services to people with arthritis. Self-management programs can be cost saving for a managed care organization.[20-21] Systems interventions should ensure that appropriate facilities and programs (e.g., self-management courses) are available at the community level and may include routine referral to such by health care providers.

The Improving Chronic Illness Care program at Group Health Cooperative of Puget Sound has pioneered a comprehensive system change approach

to quality improvement in chronic illness care. This approach combines the system changes suggested by their chronic care model with rapid-cycle quality improvement methodology developed by the Institute for Healthcare Improvement. This system change approach has been used very successfully in diabetes care and has also been used to improve care for congestive heart failure, asthma, and depression.[26] Such an approach may be useful for arthritis.

Health Communications

A necessary part of interventions is a health communications strategy. The overarching communications goal for an arthritis campaign is to increase awareness, knowledge, and beliefs necessary for appropriate management of arthritis, ultimately leading to increased quality of life among people affected by arthritis. Appropriate management includes early diagnosis, appropriate medical treatment, and self-management techniques.

Messages need to reach three broad audiences: the public, people with arthritis and their families, and health professionals. The content and delivery mode of messages may need to be tailored for subgroups within each of the three main audiences. However, for all audiences, messages should contain accurate, clearly stated information and should convey that something can be done about arthritis.

As an example, CDC has recently launched a campaign to promote physical activity among Caucasians and African Americans aged 45–64 years with lower income and education whose arthritis affects or threatens to affect their life roles. The campaign's theme line is "*Physical activity. The arthritis pain reliever*." Initial communications objectives are to

- Increase the belief that self-management is an important part of arthritis management.
- Increase the audience's confidence in their ability to perform self-management behaviors, specifically regular, moderate physical activity.
- Increase trials of self-management behaviors, specifically moderate physical activity.

Health communications activities should be part of a larger plan to address factors affecting behavior (e.g., social norms, policies, economics, the environment) and should be incorporated into the plan at an early stage. The CDCynergy program can assist states in planning communications activities. Additional recommendations are to

- Incorporate an evaluation component in communications activities from the start. Much needs to be known about communication's role in changing arthritis-related behavior.
- Be culturally sensitive and competent in developing strategies and messages, conducting research, and implementing and evaluating communications efforts.
- Ensure that the audience receives a single, simple, specific, and consistent message targeted to them. Communications planners will need to make difficult decisions about which of the many possible arthritis messages should be the focus and which should be left for a later time. Methods that can help communicators develop effective messages include conducting formative research, segmenting the audience, and using a social-marketing or consumer-oriented approach to look at the problem and possible solutions from the audience's point of view.
- Conduct qualitative and quantitative audience research to help understand the audience's perception of specific concepts and their ability to do what is being asked. Research should include formative research, pretesting of concepts and messages, and monitoring during the program.
- Examine the wide range of actual and perceived barriers and incentives for healthy (and unhealthy) behaviors and address them. Social marketing provides a useful framework for thinking about how to make behavior change easier.
- Remember that health messages are heard or seen in a context of numerous competing messages in the media, on the Internet, and from family and friends, and consider this context in developing communications strategies and messages.

Evaluation

CDC recommends an existing set of measures for gauging initial program progress (see www.cdc.gov/nccdphp/arthritis). These measures address resources and staffing, appropriate and effective partnerships, analysis and use of data in decision-making, and endorsement and dissemination of state plans.

Intermediate outcome evaluation measures for programs should include rates and trends of surveillance indicators. Examples include mean reported healthy days among people with arthritis and the proportion of people with arthritis reporting the following: activity limitations, getting regular physical activity, not being overweight, having been advised by a doctor to be physically active, ever having taken a class on self-management, and having their work affected by arthritis or joint symptoms. Additional measures of interest include the proportion of overweight people whose doctor advised them to lose weight, the proportion of people with chronic joint symptoms who have sought medical evaluation for the symptoms, and the proportion of working-age people with arthritis who are employed.

Ultimately, programs should be evaluating changes in the following measures among people with arthritis:

- Awareness of the signs and symptoms of and management options for arthritis.
- Awareness of the need for early diagnosis and appropriate management.
- Self-management attitudes and behaviors.
- Participation in self-management programs.
- Early diagnosis and appropriate management among people with joint symptoms and arthritis.
- Physical, psychosocial, and work function.
- Pain, disability, and quality of life.
- Inclusion of self-management as part of routine medical care for arthritis.

Programs should periodically evaluate the state plan to review progress toward accomplishing overall goals and objectives and to assess the need for redirecting activities or resources. Program components should be evaluated regularly using a broad range of both qualitative and quantitative measures to ensure that a mixture of process, immediate impact, and long-range outcome information is used to determine effectiveness.

Using methods that are congruent with the state plan, programs should conduct process evaluation to objectively describe program elements and implementation. This level of evaluation should be used to guide adjustments to plans and implementation strategies to improve the quality, effectiveness, and efficiency of activities. Programs must also evaluate the fidelity of program implementation to make sure that proven interventions are delivered as they should be. Examples of potential process evaluation components for a community-based program include the number and demographic characteristics of those reached through the program and the program's budget details, including funding sources and program expenses. Training needs should also be evaluated.

Those who have a direct interest in the program's initiatives should have the opportunity to participate in evaluation activities. Such stakeholders may include those who participated in developing the state plan, health care providers, community representatives, and policy makers. Including stakeholders in evaluating program initiatives can increase the relevance, clarity, and integrity of evaluation results and improve the likelihood that the results will be used. Partners not involved in evaluation efforts should be advised of the evaluation's progress and outcomes and its potential relevance to their activities.

Evaluation results and lessons learned should be disseminated through written reports and presentations at national and state meetings and conferences. Partner organizations such as the Arthritis Foundation and other state agencies can also help disseminate program evaluation results by making them available to their members and constituents.

Professional Development and Training

Well-trained state and local health department staff are essential for effectively monitoring the burden of arthritis and for designing, implementing, and evaluating public health interventions to reduce this burden. State health departments are responsible for guaranteeing that staff receive the appropriate training to perform these functions. In addition, ongoing training for all staff should be available as the arthritis program evolves or new scientific or programmatic developments occur.

Training can include formal education programs and technical assistance and less formal training methods such as peer communications. Key areas for training include information about arthritis and its management, reaching diverse populations, the continuum of prevention strategies, program planning and evaluation, health communications, and use of surveillance data. Current training resources include the following:

- Formal Internet-based training modules on The Arthritis Challenge, and Arthritis: The Public Health Response, developed by the Association of State and Territorial Directors of Health Education and Public Health Education (ASTDHPPHE) and hosted on its Web site (see www.astdhpphe.org/).
- Informal training available through the annual Arthritis Program grantee meetings, with conference proceedings also available on the ASTDHPPHE Web site.
- Peer communications through conference calls and the Arthritis Program grantee bulletin board.

Future training opportunities include a biannual distance-based-learning conference that will likely be broadcast via satellite and the World Wide Web. In addition, states are encouraged to work with state partners, including the AF chapters (see www.arthritis.org), to both share training resources and develop new training materials. The following activities may also be considered:

- Assess training needs throughout the state.
- Use the results of the needs assessment to develop a rigorous, comprehensive training and professional development program consisting of a wide range of opportunities, from continuing education classes and technical assistance sessions to peer communications networks. Use already developed training materials and courses if appropriate.
- Increase the number of organizations and individuals involved in planning and conducting community-level education and training programs.

Training should also address the need for more trainers for interventions such as PACE (People with Arthritis Can Exercise) and the Arthritis Self-Help Course. Health care providers and staff of managed care organizations may benefit from training in the appropriate management of arthritis and in the referral of patients to appropriate community programs and other resources in their area. Partnerships with health care delivery systems and professional organizations will help to accomplish such training.

Funding

States beginning to develop programs should focus on providing leadership to monitor the burden of arthritis in the state, to develop and foster partnerships among agencies addressing arthritis, and to catalyze the development of a state plan. The following resources are needed to establish a program:

Funds: $120,000
Staff: One full-time program manager

As program resources increase, activities should expand. A more comprehensive program should have the capacities and competencies needed to develop, implement, and evaluate community-based programs to decrease the burden of arthritis in the population. The following resources are needed for a more comprehensive program:

Funds: $300,000 to $1,250,000
Staff: Project manager, epidemiologist, evaluator, programmer, intervention specialist, health communications specialist

Progress to Date and Challenges Ahead

The CDC Arthritis Program is working to develop an integrated public health approach to monitor the burden of arthritis, to support and conduct prevention research to ensure that we have the best interventions for community-based efforts, and to foster programs to reduce the impact of arthritis in the United States. The overall goal of both CDC and state arthritis programs is to increase the quality of life among people affected by arthritis by decreasing pain and disability and increasing function. Increasing self-management beliefs and behaviors, such as being physically active, is key to achieving the goals of these programs.

As the public health system has mobilized to address arthritis, several population-based approaches have emerged; these include health communications campaigns, changes in health systems to incorporate routinely assessing and addressing self-management education needs and physical activity among people with arthritis, and community-based strategies to increase physical activity and access to and availability of evidence-based self-management education programs. There are three major challenges ahead:

- *We need more interventions.* The types of evidence-based interventions (e.g., self-management education and programs to increase physical activity) currently available are not sufficient to meet the needs of all people with arthritis. Additional interventions are needed that are relevant to the diverse groups of people affected by arthritis. Programs that vary in content and are delivered in different ways (e.g., Web-based, classroom) are needed.
- *We lack adequate information on how best to deliver evidence-based programs.* For instance, where are the best places to reach people with arthritis? How does this differ among different groups? How can we work with large and small employers to reach people with arthritis? What are the natural, synergistic partnerships to deliver interventions? How can arthritis messages be delivered through other programs? What are the characteristics of successful partnerships to best serve the needs of people with arthritis?
- *We lack sufficient capacity to deliver available evidence-based interventions.* How much capacity should be available at the state and local health department level? How can we develop this capacity? How do we develop partnerships with others to maximize our respective efforts?

Technical Resources Available on the World Wide Web

Action plans

National Arthritis Action Plan—The consensus action plan from more than 90 organizations for a public health approach to arthritis:

www.cdc.gov/nccdphp/arthritis/index.htm

Examples of state plans that illuminate varying approaches to dealing with arthritis at the state level:

www.cdc.gov/nccdphp/arthritis/states.htm

Surveillance

The CDC Arthritis Program's recommended BRFSS case definition for arthritis:

www.cdc.gov/nccdphp/arthritis

The National Arthritis Data Workgroup's recommended *ICD-9-CM* codes for the 100-plus conditions that represent arthritis and other rheumatic conditions:

www.cdc.gov/nccdphp/arthritis

Grouping of *ICD-9* codes for analysis of broad rubrics:

www.cdc.gov/nccdphp/arthritis

Healthy People 2010's eight objectives directly related to arthritis:

www.health.gov/healthypeople/Document/HTML/Volume1/02Arthritis.htm#_arthandother

Interventions

Arthritis Self-Help Course, a 6-week course that is an effective self-management education intervention for people with arthritis:

www.arthritis.org/events/getinvolved/ProgramsServices/ArthritisSelfHelp.asp

PACE, a community-based recreational exercise program with demonstrated benefits for people with arthritis:

www.arthritis.org/events/getinvolved/ProgramsServices/PACE.asp

Evaluation

The CDC Arthritis Program's matrix for evaluating state arthritis programs:

www.cdc.gov/nccdphp/arthritis

A collection of evaluation aids and guidance:

www.cdc.gov/eval/resources.htm

Training

The Arthritis Challenge, a modular course teaching the basics about arthritis, including epidemiology, prevention, and treatment, and Arthritis: The Public Health Approach, a modular course on applying public health measures to control arthritis in the community setting:

www.prospectassoc.com/arthritis/

2000 Arthritis Grantee Meeting proceedings—Lectures and slides from the 2000 annual meeting covering a variety of programmatic issues and discussions:

www.astdhpphe.org/confarth/agenda.htm

General information about arthritis

Arthritis Foundation:

www.arthritis.org

Lupus Foundation of America:

www.lupus.org

National Institute of Arthritis & Musculoskeletal Diseases:

www.nih.gov/niams

Johns Hopkins arthritis site:

www.hopkins-arthritis.org

American College of Rheumatology:

www.rheumatology.org/index.asp

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Promoting Oral Health Throughout the Lifespan

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Promoting Oral Health Throughout the Lifespan

Claudia L. Vousden, MPH, and Linda S. Orgain, MPH

Introduction

Oral health is an essential component of health for people of all ages. No one can achieve optimal health without freedom from the burden of oral diseases.[1] Although most of these diseases are preventable, they still cause millions of Americans to experience needless pain and suffering, difficulty in chewing and, often as a result, poor nutrition, higher health care costs, loss of self-esteem, and decreased economic productivity.[2] Emerging research evidence also suggests possible associations between periodontitis (severe gum disease) and chronic diseases such as diabetes and cardiovascular diseases, as well as increased risks for premature births and low birth-weight babies among pregnant women with such disease.

Although community preventive measures such as water fluoridation, school-based dental sealant programs, and smoking prevention and cessation programs can significantly reduce rates of oral diseases, these measures are often underused or unavailable to those who need them most. State health departments, which play an important role in providing community preventive services, need an adequate oral health infrastructure to carry out core public health activities. These activities include monitoring the population's oral health status and behaviors, developing effective programs to improve the oral health of children and adults, evaluating program accomplishments, and informing key stakeholders, including policy makers, of program results.

This chapter provides information on community practices that have been effective in preventing oral disease, as well as information on the essential components of effective state oral health programs.

Burden

Although Americans make about 500 million dental visits each year[3] and spent an estimated $68 billion on dental services in 2002,[4] many do not have adequate access to or avail themselves of measures known to prevent oral diseases and conditions. Dental caries (decay) remains one of the most common diseases among U.S. children.[1] This preventable health problem can begin in infancy, as soon as the primary teeth erupt. Eighteen percent of children aged 2–4 years have experienced dental decay,[5] as have 78% of 17-year-olds.[1] Left untreated, dental decay in children can cause pain, malnutrition, and poor appearance, all of which can lower a child's self-esteem and ability to succeed.

Serious oral health problems also occur among adults. Approximately one in three U.S. adults has untreated dental decay and is in need of preventive and treatment services.[5] In 1995, dental visits and dental problems resulted in productivity losses of approximately $3.7 billion for hours missed from work and $1.8 billion for days of restricted activity.[6] Gingivitis, characterized by red, inflamed gums and often accompanied by pain, swelling, and bleeding, is found in 48% of adults aged 35–44 years. If not controlled, gingivitis may lead to destructive periodontal diseases and eventual tooth loss. Although the rate of tooth loss among Americans has decreased in recent years, as many as 30% of those aged 65 years or older have lost all their natural teeth.[5]

In addition, about 30,000 Americans are diagnosed with and 8,000 die of oral and pharyngeal cancers each year (Table 1). These cancers are the fourth most common types of cancer among black men and the seventh most common among white men.[1] Survival is closely related to the stage of the cancer when it is diagnosed: the 5-year survival rate is only 23% for those with disease that has spread, compared with 82% for those with localized disease. Even though oral cancers occur in sites that tend to make them easy to diagnose and treat, only about 34% are localized at the time of diagnosis.[7] The surgical treatment often needed by those diagnosed at later stages can result in substantial functional impairment and permanent disfigurement. Potential problems include loss of parts of the tongue and jawbones, loss of taste, loss of ability to chew, difficulty with speech, and pain. People who undergo surgery for oral cancer must also often cope with an altered appearance and rehabilitation and are at risk for depression.[1]

Oral health and access to preventive dental services vary substantially by race and by various sociodemographic factors. The percentage of children aged 6–8 years who have untreated dental decay was found to be substantially higher among Hispanics (43%) and African Americans (36%) than among whites (26%).[5] Among low-income children aged 5–17 years, 44% have untreated dental decay.[1] In 1993, only 20% of Medicaid-eligible children received at least one preventive dental service, such as the application of fluoride or sealants.[8]

Oral health disparities also exist among adults. Those with only a high school education or less are more likely than those with at least some college education to have destructive periodontal disease, more likely to have lost all their teeth if they are aged 65 or older, and less likely to report receiving examinations that can detect oral cancer.[5] For men with oral and pharyngeal cancers, the 5-year survival rate is lower among blacks (29%) than among whites (58%); death rates for these diseases peak among black men aged 55–64 years, which is about 20 years sooner than among white men.[7]

Americans' access to and use of dental services varies by race and ethnicity, income, and insurance coverage. The most frequent reasons cited for not using dental services are perceived lack of a dental problem, edentulism (total tooth loss), and cost of

Table 1. Incidence Rates of Oral and Pharyngeal Cancers per 100,000, by Race and Gender, 1992–1999

Race	Men	Women
Black	21.9	6.8
White	16.7	6.7
Asian and Pacific Islander	13.5	5.8
American Indian and Alaska Native	13.0	3.6
Hispanic	10.3	3.8

Note: Age-adjusted to the 2000 U.S. standard population.
Source: *SEER Cancer Statistics Review, 1973–1999.* Available at seer.cancer.gov/csr/1973_1999.

care.[1] Dental insurance coverage is associated with increased use of services.[3, 9] In a 1995 survey, 78% of people with insurance reported having seen a dentist in the prior year, compared with only 58% of those without insurance.[9] Insurance coverage is highest among whites (42%), people with more than a high school education (51%), and families with yearly incomes of $35,000 or more (61%). Coverage is lowest among Hispanics (30%) and blacks (32%). Age-related disparities in coverage also exist; people aged 65 or older reported the lowest levels of dental insurance coverage, and dental services covered through Medicare are very limited. Despite current levels of private insurance and recent improvements in dental care access through publicly funded insurance programs such as Medicaid and the State Children's Health Insurance Program (SCHIP), for each child without medical insurance, 2.5 children are without dental insurance.[1]

Healthy People 2010 Objectives

Healthy People 2010 includes 17 objectives that reflect a commitment to preventing and controlling oral diseases and improving Americans' access to dental services. These objectives specify targets for improvements in several critical areas, including the following:

- Rates of dental decay among children, adolescents, and adults.
- The prevalence of gum disease and tooth loss.
- Early detection of mouth and throat cancers and death rates from these cancers.
- The percentage of people who receive preventive and other dental services.
- The percentage of children who have received dental sealants.
- The percentage of people who receive optimally fluoridated water.

Other objectives target increases in the number of school-based health centers, community health centers, and local health departments that have an oral health component; increases in the number of state, tribal, and local health agencies that have an effective dental public health program directed by a dental public health professional; and increases in the number of states that have an oral and craniofacial surveillance system. Other *Healthy People 2010* focus areas such as cancer, diabetes, nutrition, and tobacco use also contain objectives related to oral health.

Prevention Opportunities

Primary, Secondary, and Tertiary Prevention Interventions

Much can be done to reduce the burden of oral diseases and achieve the *Healthy People 2010* objectives by using a multifaceted approach that includes community-based initiatives, self-care, and professional care. The positive impact of community water fluoridation on the prevalence and severity of dental decay in the United States has been called one of 10 great public health achievements of the 20th century.[10] Other *primary prevention* measures that effectively prevent dental decay include the application of dental sealants and the use of oral health products that contain fluoride, such as toothpaste, mouth rinses, dietary fluoride supplements, and professionally applied varnishes and gels. A balanced diet that limits snacks high in sugars and carbohydrates also helps prevent dental decay. In addition, self-care practices that include regular tooth brushing and use of dental floss play a crucial role in maintaining the health of gums, as do regular professional cleanings. Programs designed to prevent people from starting to use tobacco or to help them quit can also help prevent oral cancer and periodontal diseases. Because alcohol, either alone or in combination with tobacco, increases users' risk for oral cancer, strategies to promote responsible alcohol use also are relevant to oral health.

Secondary prevention measures include a variety of mechanical, chemical, and radiological approaches that can eliminate the need for extensive care. Early diagnosis and treatment of oral diseases, best accomplished through periodic examinations, reduce patients' risk for tooth loss, systemic health effects, and even, in rare cases, death. Removing decayed tissue and restoring structure and function at early stages of tooth decay can prevent tooth loss or the

need for more extensive treatment. Secondary prevention measures to diagnose and treat periodontal diseases (gingivitis and periodontitis) include physical examination, periodontal probing, X-ray examination, microbiologic and histologic testing, professional removal of irritants including hard (i.e., tartar) and soft (i.e., plaque) deposits, and local application of antimicrobial agents. Physical and visual examinations are also effective measures for detecting oral cancer at its early, most treatable stages. Assessment of past and present tobacco and alcohol use is a key intervention for identifying those who are at highest risk for oral cancer and most likely to benefit from physical examination and early detection. In cases of small or suspicious lesions, excisional biopsy can be performed.

Avoiding disability from oral diseases in intermediate and late stages requires *tertiary prevention* measures, which include more aggressive and costly surgical, radiological, and chemical interventions. Restorative care for people with advanced tooth decay ranges from crowns to prosthetic devices and implants when decay results in tooth loss. Like cavities, periodontitis can also be treated by a variety of surgical procedures or by administering antimicrobial agents either locally or systemically. Tertiary treatment for advanced oral cancers can involve multiple surgical procedures, radiation, and chemotherapy. These measures can result in mild to severe functional impairments and disfigurement that requires reconstructive surgery and rehabilitation.

Community-Based Interventions and Essential Strategies

Oral health programs at the state level should concentrate on population-based, primary prevention strategies and interventions. However, such programs may also need to provide secondary prevention services that require partnerships with external organizations such as local health departments, community health centers, and professional associations of dentists and other health care providers. In determining priorities and selecting strategies for oral health programs, public health officials should consider findings from surveillance activities and needs assessments and, when possible, select those strategies and interventions shown to be effective and efficient. When they choose to include a promising but relatively unevaluated prevention measure, these officials should be especially diligent in conducting evaluations to determine the effectiveness of the measure.

As part of a cooperative agreement with CDC, the Association of State and Territorial Dental Directors (ASTDD) has launched the Best Practices Project, which is preparing a series of reports on proven and promising best practices for state and territorial oral health programs. The objective of this project is to help states achieve *Healthy People 2010* objectives, meet the "National Oral Health Call to Action" of the Surgeon General, and build infrastructure capacity at both the state and local levels. The series of reports, which will be provided on the organization's Web site (www.astdd.org) in 2003, will summarize the current state of evidence on dental public health approaches and share ideas from successful practices reported by state and territorial oral health programs. The first set of ASTDD reports will include dental public health approaches to fluoridation, school fluoride programs, school sealant programs, oral health surveillance, state oral health plans, state oral health coalitions and collaborative partnerships, oral cancer prevention and control, and access to care.

Fluoridation. Fluoridation of community drinking water, a major factor in the dramatic decline of tooth decay during the second half of the 20th century, remains among the most successful oral health interventions.[10] Although 65.8% of Americans on public water systems currently have access to fluoridated water, approximately 100 million Americans are still without its benefits.[11] Community water fluoridation is an ideal public health intervention because it is effective, safe, and inexpensive and generally requires no effort or direct action from those who receive its benefits. Thus it also tends to reduce disparities in rates of dental decay because the entire population benefits

regardless of the health literacy or financial resources of its members.[10, 12] The Task Force on Community Preventive Services, an independent nonfederal task force, strongly recommends that population-based interventions to prevent or control tooth decay include community water fluoridation. This recommendation is based on the results of the task force's systematic review of studies on fluoridation, which showed that community water fluoridation reduced rates of tooth decay by 30%–50% among children of varying socioeconomic status.[13]

In an economic analysis of fluoridation, researchers calculated fluoridation-related "cost savings" as the difference between the annual estimated cost of averted disease and the cost of fluoridation per person (Table 2). They calculated the cost of averted disease using an estimated annual increment of dental decay in nonfluoridated communities, a lower annual increment of dental decay in fluoridated areas, and the expected lifetime cost of maintaining amalgam fillings.[12]

In *Engineering and Administrative Recommendations for Water Fluoridation*,[14] CDC recommends that states take the following actions to establish and maintain a fluoridation program:

- Designate a state fluoridation administrator to be responsible for program management and serve as liaison with other state and federal agencies.
- Routinely inspect municipal water plants and provide technical assistance to plant operators.
- Provide training and continuing education for operators of municipal water plants.
- Establish and maintain a system to monitor fluoride concentrations in the water.
- Promote the adoption of community water fluoridation in nonfluoridated areas.

Dental Sealant Programs. Although numerous studies have shown dental sealants to be effective in reducing tooth decay,[15–19] the Third National Health and Nutrition Examination Survey, 1988–1994, showed that less than 25% of U.S. children had sealants[5] and that sealants were even less common among children of some racial and ethnic groups. *Healthy People 2010* Objective 21-8 calls for increasing the proportion of children with dental sealants on their permanent molars to 50%.[5] Sealants can be easily applied in schools, dental offices and clinics, and mobile dental units. In its review of intervention studies for evidence of effectiveness, the Task Force on Community Preventive Services found school-based and school-linked sealant programs to be effective in reducing tooth decay among children and adolescents at varying levels of risk and from different socioeconomic backgrounds. Participation in these programs was associated with a 60% median decrease in decay on the horizontal surfaces of molars and premolars of posterior (rear) teeth. As a result of its review, the task force strongly recommended that states establish school-based or school-linked sealant programs.[13]

Table 2. Annual Water Fluoridation Costs per Person and Cost Savings for Communities of Various Sizes

Community Population	Cost of Fluoridation	Cost Savings
<5,000	$3.17	$15.95
5,000–9,999	$1.64	$17.48
10,000–20,000	$1.06	$18.06
>20,000	$.50	$18.62

Note: Reported in 1995 dollars.
Source: Adapted from Griffin et al., 2001.[12]

A State Oral Health Program in Action

"Healthy Smiles for **Wisconsin**" is a CDC-supported statewide program to improve the oral health of Wisconsin children through school and community partnerships. The program is a collaboration between Wisconsin's Department of Public Instruction and its Department of Health and Family Services. One major partnership is the statewide Healthy Smiles for Wisconsin Coalition, comprising more than 25 state, public, and private agencies and organizations within the state. The coalition's "Seal a Smile" initiative, started in October 2000, enabled 40 community dental sealant programs to be established during the 2000–2001 school year. As of fall 2001, more than 5,500 school children in 40 counties across Wisconsin had received dental sealants through this sustainable program.

States should develop sealant programs that both educate people about sealants and facilitate sealant application. To increase public awareness of the effectiveness and availability of sealants to prevent tooth decay, state programs should use public education and targeted communications strategies. To help provide this clinical intervention, state programs should collaborate with community organizations and dental care providers. School-aged children in high-risk populations can be reached through school- and community-based programs. Many state public health programs already have the child health and educational resources necessary to promote oral health and address the oral health needs of school-aged children. States should build on existing coordinated school health programs initiated by CDC's Division of Adolescent and School Health within state departments of education or on similar programs to reach low-income, school-aged children who are at high risk for oral disease. By working with dental health providers and other community partners, such coordinated school-based or school-linked programs can provide oral health education, sealant applications, other preventive services, and treatment referrals for at-risk, school-aged children.

Oral Cancer Prevention and Control. Public health efforts have generally focused less on oral cancer than on other forms of cancer. But this form of cancer, which can result in disfigurement and disability as well as death, is associated with risk factors that can often be modified through public health intervention. States should play a role in educating people about oral cancer, its impact on the general population and high-risk populations, and the effectiveness of interventions. Oral health programs should collaborate with state cancer prevention and control programs to analyze oral cancer data from cancer registries, state public health surveys, Medicare, and health system organizations. The results of these analyses will allow them to define the extent of the problem, identify high-risk groups, integrate oral cancer issues into state comprehensive cancer control plans, and guide interventions. State oral health programs also should collaborate with tobacco control and alcohol abuse programs to ensure that those programs address oral cancer and to efficiently integrate prevention interventions across programs; such an approach helps to maximize the use of resources and eliminate duplication of effort. For example, state public health programs addressing oral health, cancer, tobacco use, and alcohol abuse should collaborate with each other and with partner organizations to encourage dental and other health care providers to regularly screen their patients for alcohol and tobacco use and to provide appropriate education, counseling, and referrals for people they identify as being at increased risk for oral cancers.

Infrastructure

Programs within state health agencies play a vital role in reducing oral health disparities and in improving their constituents' oral and overall health. These programs are positioned to link federal, state, and local resources and to direct and integrate the efforts of multiple organizations. To meet the oral health goals and objectives of *Healthy People 2010*, each state needs to have an oral health program with adequate resources to carry out effective population-based interventions.

A State Oral Health Program in Action

In the early 1990s, the **New Hampshire** Department of Health did not have an oral health program, and the state had one of the lowest rates of access to fluoridated water in the nation (24%). Not only did the state lack the capacity to plan, implement, and evaluate oral disease-prevention programs, but it also had little capacity to gather or analyze oral health surveillance information. In 1997, CDC began collaborating with the Health Resources and Services Administration (HRSA) to support the development of public health interventions, particularly community water fluoridation, in New Hampshire. With modest federal funding, the state hired a part-time program coordinator for oral health. CDC provided technical assistance on strategies for promoting community water fluoridation. In 1999, Manchester, the state's largest city, approved water fluoridation in an initiative election. CDC engineers then worked with state water department staff to design a fluoridation system, and Manchester implemented this system in 2000. Today, 43% of New Hampshire residents using public water systems are receiving fluoridated water. Also in 2000, a CDC epidemiologist was assigned to New Hampshire with instructions to devote 25% of his time to oral health. In 2001, New Hampshire hired a full-time director for the state's oral health program.

Two publications by ASTDD describe how to develop state and local oral health programs. The first, *Building Infrastructure and Capacity in State and Territorial Oral Health Programs*,[20] describes the public health functions of state oral health programs and the resources they need to maintain program infrastructure and capacity. The second, *Guidelines for State and Territorial Oral Health Programs*,[21] outlines the core public health functions that are most pertinent for state oral health programs and describes associated activities. The following are some of the core public health functions and activities that ASTDD cites as being most essential to establishing and maintaining a state oral health program:

- Maintain an adequately staffed oral health unit skilled in performing public health functions.
- Ensure that the program staff has the capacity and expertise to effectively address oral health needs.
- Establish and maintain an oral health surveillance system for ongoing monitoring, evaluation of interventions, and timely communication of findings.
- Build linkages with partners interested in reducing the burden of oral diseases by establishing a state advisory committee or work group and community coalitions.
- Develop a state oral health plan through a collaborative process.
- Educate the public and policy makers about oral health problems and build support for policies and resources to overcome them.
- Support the implementation of services that focus on primary and secondary prevention.
- Evaluate the effectiveness, accessibility, and quality of both population-based and individual oral health services.

Logic models can be useful tools in planning, developing, monitoring, and refining oral health programs. A well-developed logic model portrays the process through which a program plans to accomplish its goals and objectives by linking program inputs, resources, and activities to desired products and short-term, intermediate, and long-range outcomes. Logic models can be applied on multiple levels, including the program level and the individual intervention level. Because they display the context in which a program is conducted, logic models can be used to focus and plan program evaluations and other activities. Resources for applying, developing, and using logic models in oral health are available under "Infrastructure Development Tools" on the CDC Oral Health Web site at www.cdc.gov/oralhealth/library/infrastructure.htm.

A logic model for developing an overall oral health program is displayed in Figure 1.

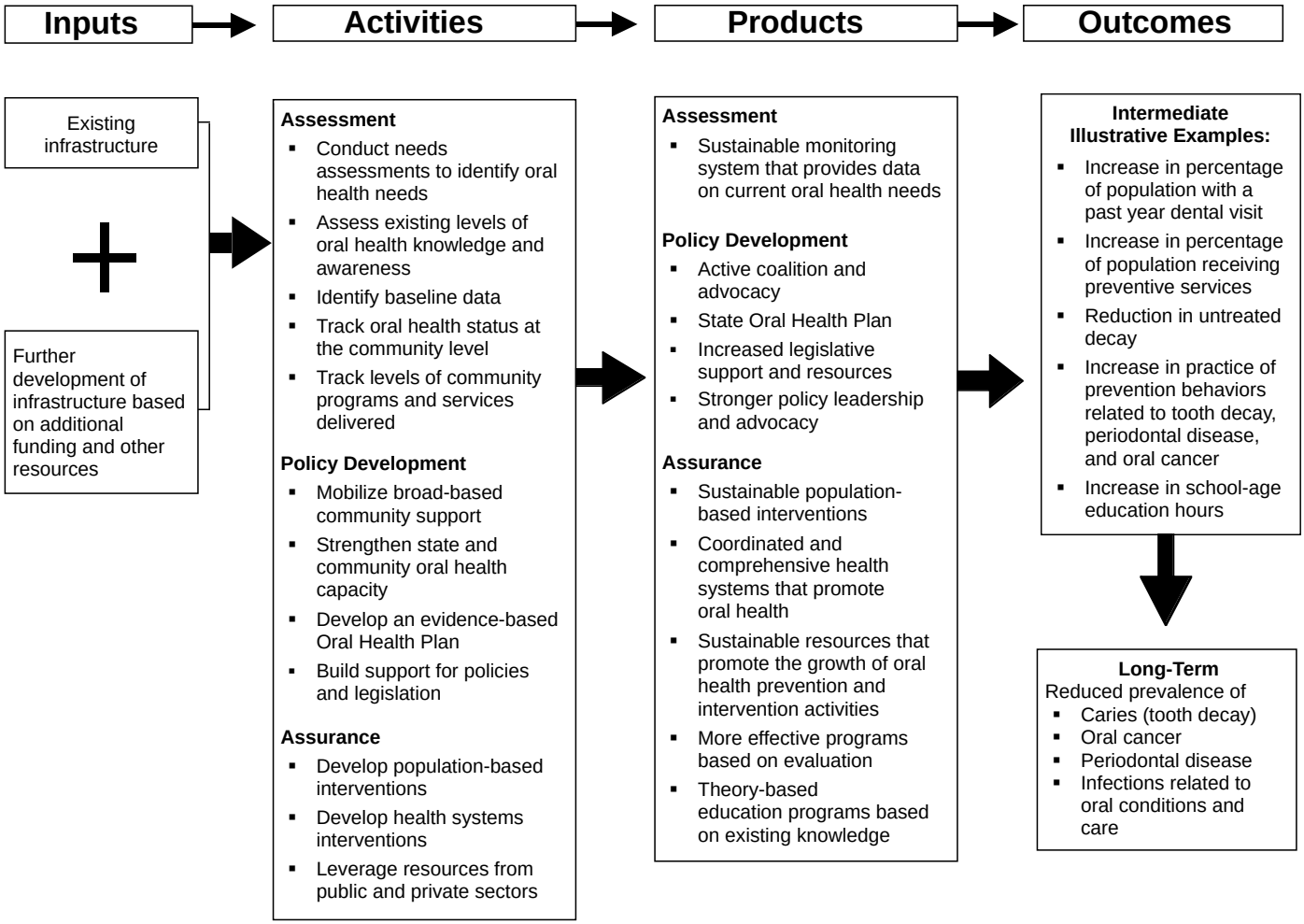
Program Management and Administration

To conduct effective state programs for oral disease prevention and control, states must have an adequate oral health infrastructure. A key component of this infrastructure is at least one staff member with the capacity to manage and lead programs. Results of a 1993 survey showed that states with full-time state dental directors conduct more oral health-related assessments, public policy development, and assurance of services needed to achieve oral health goals and objectives than states with part-time directors.[22]

To promote effective leadership and management of oral health programs, states should

- Maintain a full-time dental director position within the state health department and encourage local health departments with jurisdictions that have 250,000 or more people to do the same. These positions should be filled by dental professionals with public health training.
- Establish program staff positions to carry out the activities that support the core public health functions of assessment, policy development, oral health planning, and assurance. These positions should give state agencies the capacity to provide comprehensive surveillance and epidemiology

Figure 1: Global Logic Model for Oral Health Programs



services, offer sound financial management and administrative support, create viable strategic plans, and deliver multifaceted programs.

Surveillance

State-level surveillance of residents' oral health status and health-related behaviors is essential for determining state-specific trends, selecting interventions, identifying resources, and evaluating the success of interventions. Its importance is highlighted by *Healthy People 2010* Objective 21-16, which calls for an increase in the number of states that have an oral health surveillance system.[5]

The National Oral Health Surveillance System (NOHSS) is designed to help public health programs monitor the burden of oral disease, the use of the oral health care delivery system, and the status of community water fluoridation on both a state and national level. The NOHSS currently tracks the following indicators:

1. Percentage of adults who visited a dentist or a dental clinic during the prior year.
2. Percentage of adults who had their teeth cleaned by a dentist or dental hygienist during the prior year.
3. Percentage of people aged 65 or older with complete tooth loss.
4. Percentage of people served by community water systems with optimally fluoridated water.
5. Prevalence of dental sealants among K–3rd graders.
6. Percentage of K–3rd graders who have ever had tooth decay.
7. Prevalence of untreated tooth decay among K–3rd graders.
8. Incidence of invasive cancer of the oral cavity or pharynx.
9. Deaths from cancer of the oral cavity or pharynx.

NOHSS data can be accessed at www.cdc.gov/nohss.

To establish or increase their capacity to carry out oral health surveillance, states should

- Use regular, valid, and reliable data collection methods.
- Incorporate measures of oral health into existing surveys such as the Behavioral Risk Factor Surveillance System, the Youth Risk Behavior Survey, and the Pregnancy Risk Assessment Monitoring System.
- Use oral health data from national and state sources such as cancer registries, the National Health and Nutrition Examination Survey, the Water Fluoridation Reporting System, and the National Oral Health Surveillance System.
- Use the ASTDD training video, *Basic Screening Surveys: An Approach to Monitoring Community Oral Health*, and the manual, *Assessing Oral Health Needs: ASTDD Seven-Step Model*, for guidance in conducting state and community level assessments.
- Establish standards for data analysis and timely reporting.
- Provide training and technical assistance to help local agencies build their capacity to collect and analyze data.
- Allocate resources and staff for surveillance, data collection and management, quality assurance, and other tasks needed to support surveillance activities.

In addition to measuring oral health indicators, state oral health programs should periodically and systematically appraise the surveillance system they are using and identify its strengths and needed improvements.[23]

States also should build capacity to participate in ASTDD's annual survey to obtain data for the Synopsis of State and Territorial Dental Public Health Programs. This survey collects information from dental directors on state demographics, dental infrastructure and workforce, oral health program funding, staffing, and program activities. The Synopsis survey is designed to provide dental directors with data they can use in constructing “snap shots” of their state programs and their

environment. It also contains questions designed to track certain *Healthy People 2010* objectives, and provides a mechanism for state programs to track changes over time, make state-to-state and state-to-nation comparisons, and identify gaps in their state oral health systems.

Surveillance results should be presented in terms that are understandable to the public, policy makers, and others with the potential to influence oral health at the individual, community, or state levels. The ability of such decision makers to clearly and accurately comprehend the benefits and needs of oral health interventions remains critical to policy development, resource allocation, and overall program success.

An example of a logic model to guide surveillance capacity is shown in Figure 2.

State Plan

A state oral health plan should describe the burden of oral diseases and the prevalence of risk factors for them, identify high-risk populations, include objectives that prioritize and address the needs identified by surveillance and needs assessment data, and describe linkages between the state's needs and *Healthy People 2010* oral health objectives. The plan should also identify specific activities that will be undertaken to achieve each objective and the parties responsible for each of those activities.

To maximize the effectiveness of an oral health program, states should identify stakeholders and encourage them to collaborate on the development and implementation of a comprehensive oral health plan. Stakeholders may include a broad range of health care providers, consumers, advocates, and public and private organizations.

The resources needed to develop and implement a state oral health plan include sufficient funds for staff and operational expenses, expertise in using needs assessment data and developing recommendations, the capacity to produce and disseminate the plan, and the means to systematically track and evaluate its implementation.

Evaluation

Although evaluation is fundamental to public health practice, most oral health programs have not always integrated routine performance evaluation into program management. Oral health programs need to build the capacity to conduct the systematic evaluations necessary to measure their effectiveness and efficiency, demonstrate their accountability, and maintain a foundation of information to use for further program development and growth. The 1999 CDC publication, *Framework for Program Evaluation in Public Health*,[24] describes a generic outline that can be applied to the evaluation of specific program components and activities as well as to entire programs. Evaluation plans should include both qualitative and quantitative methods and describe how to evaluate a program's effectiveness in achieving the desired short-term, intermediate, and long-term outcomes. Program evaluations can also be used to identify the needs, barriers, and supporting factors associated with setting up a particular type of program and modifying existing interventions.

Using methods specified in the state oral health plan, oral health programs should measure their short-term outcomes and make any needed changes to their plans and, if necessary, to their implementation strategies. An example of a short-term outcome for a school-based sealant program is the number and demographic characteristics of those reached through the program compared with those targeted.

As oral health programs mature and develop the capacity to implement interventions and define which interventions reach what proportion of the target populations, they should evaluate the relationship between program activities and intermediate outcomes. Examples of such outcomes include the percentage of state residents with access to fluoridated drinking water, the percentage of residents with access to oral health services, the percentage of residents who use such services, the percentage of oral health care providers who assess their patients' use of tobacco and alcohol, and the net cost-benefit value of school-based sealant

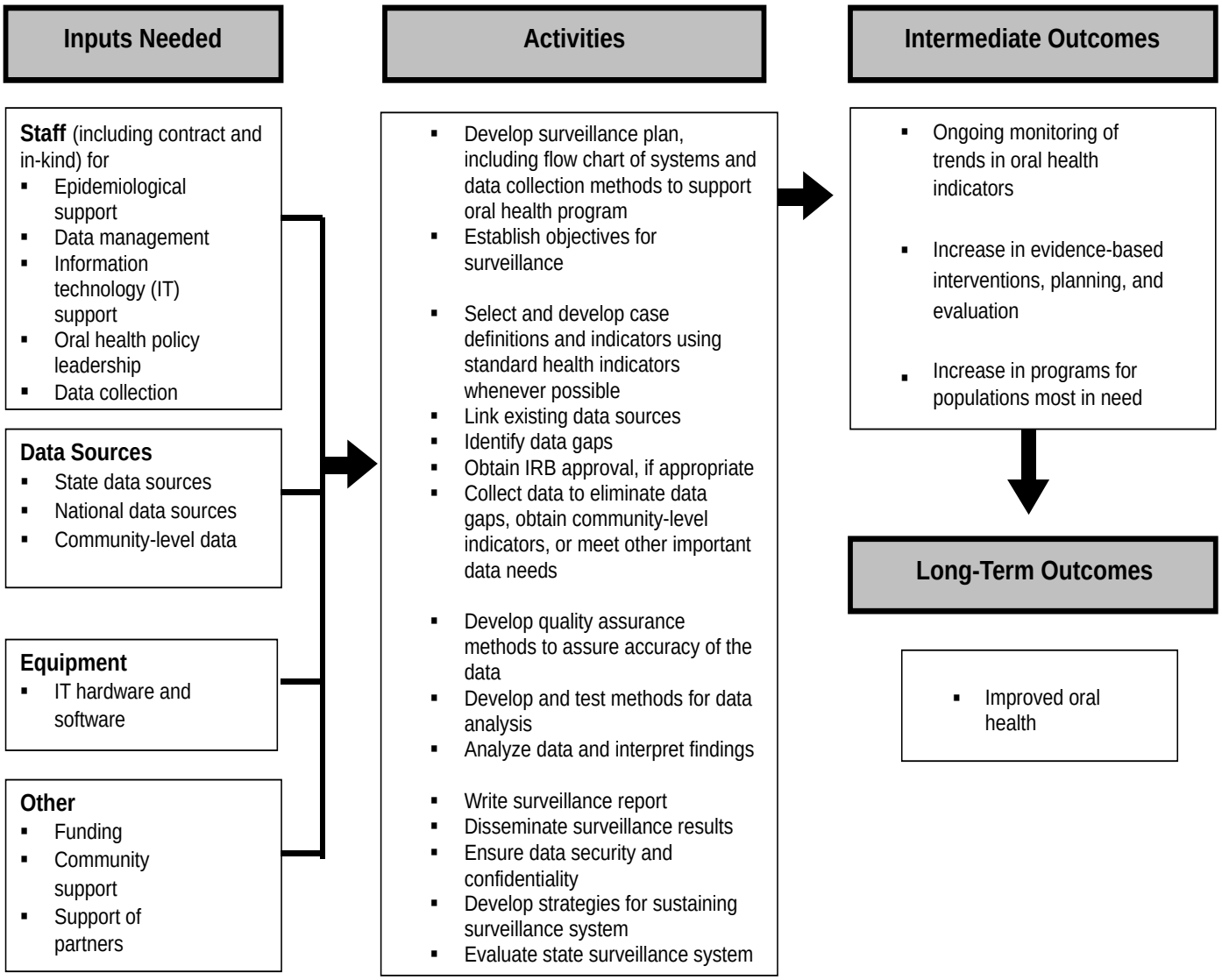
programs.

Fully mature oral health programs will also need to evaluate their success in reaching long-range objectives such as preventing dental decay, periodontal diseases, tooth loss, and oral cancer, as well as in reaching quality-of-life objectives such as reducing days missed at school or work because of oral disease.

Those who have a direct interest in program initiatives should participate in evaluation activities. Such stakeholders may include those who helped develop a state oral health plan, health care providers, community representatives, and policy makers. Including all stakeholders in the evaluation of program initiatives not only can increase the relevance, clarity, and integrity of evaluation results, it also should increase the likelihood that the results will be used to influence and support public policy.[24]

In addition to using evaluation results and lessons learned to update the state oral health plan and strengthen programs, state health officials should disseminate these findings through written reports and presentations at national, state, and local

Figure 2: Logic Model for Surveillance



State Oral Health Programs in Action

In 1998, the **Rhode Island** Department of Health did not have an oral health program or state dental director and thus lacked the leadership necessary to develop the capacity to plan, implement, and evaluate oral disease prevention programs. By linking with private partners and other agencies, however, the health department successfully gathered data revealing that (1) in 1994, 70% of elementary school children in Providence had some tooth decay; (2) in 1996, only 28% of children under age 14 enrolled in the state's Medicaid program had dental sealants; and (3) in 1998, 35% of children screened in 10 Providence inner-city elementary schools had unmet oral health needs. Motivated by these findings and provided with CDC funding, the Rhode Island Department of Education and Department of Health collaborated to establish *Healthy Schools! Healthy Kids! (HS!HK!)*, a statewide initiative to improve the oral health of Rhode Island children through school and community partnerships. Guided by the statewide *HS!HK!* Steering Committee, which included representatives from more than 30 public and private agencies, foundations, and organizations, Rhode Island hired a dental director, a health educator, and an oral health program coordinator. Subsequently, the state's Department of Health and Department of Education again worked collaboratively to establish a state regulation requiring schools to provide standardized oral health screening annually for children in grades K–5 and once more for those in 7th and 12th grades. Children found to be in need of dental care are referred for treatment. The analysis of data on oral health status, collected using a standardized screening protocol, helps program leaders define their current needs and plan future oral health program activities.

State Oral Health Programs in Action

In 1999, the director of the **Ohio** Department of Health recognized dental care as the primary unmet health care need of Ohioans and appointed a task force, chaired by a past president of the Ohio Dental Association, to study the issue and make recommendations. Other members of the task force included representatives from state and local agencies, the Ohio General Assembly, dental schools and dental residency programs, professional associations, nonprofit organizations, consumer groups, business, and labor. The task force issued recommendations designed to (1) improve and expand Medicaid and the state Children's Health Insurance Program, (2) improve the dental care delivery system, (3) support community action to improve access to oral health care, and (4) increase public awareness of issues related to oral health and access to dental care. After the task force issued its recommendations, a team of representatives from state agencies created a state action plan. As a result of the task force's efforts, access to dental care was included as one of the top 10 priorities of the Ohio Department of Health. In addition, the Ohio Dental Association has resolved to help implement the task force's recommendations.

meetings and conferences. Partner organizations such as other state agencies and state chapters of oral health and other health-related professional associations can further disseminate program evaluation results by making them available to their members and constituents.

Partnerships

Partnerships are an essential mechanism for addressing many of the factors that influence oral health and for leveraging resources for oral health programs. While the potential partners for oral health programs will vary from state to state, in most they should include other state agencies such as the departments of education and the environment; state dental, dental hygiene, public health, physician, and

nursing associations; rural and migrant health care centers; in-state schools of public health, dentistry, dental hygiene, medicine, and nursing; and any other groups with an interest in improving the oral health of the state's population. Other potential partners include managed care organizations, hospitals, nonprofit organizations, and businesses.

For example, state departments of health and education and state associations of school nurses may form partnerships to help integrate oral health promotion and services into coordinated school health programs. State health departments may also form partnerships with state oral health professional associations, environmental departments, chapters of the American Water Works Association, and, where applicable, the Rural Water Association to establish, maintain, and expand community water fluoridation.

Partners may also contribute by serving on broad-based advisory committees responsible for guiding the activities of the state oral health program. These committees may help write, critique, and suggest modifications to the state oral health plan, identify needs and problems, help set priorities, assist in coordinating services, and advocate for prevention programs and funding.

Often, these partnerships take the form of coalitions: independent groups formed to educate public officials, policy makers, program administrators, and health care professionals about oral health problems and solutions. Such coalitions may also help by promoting appropriate oral health policies and soliciting both public and private resources to provide people with better access to oral health services. Generally, the goals of coalitions are to reduce political, economic, and social impediments; systemic, organizational, and administrative obstacles; income, geographic, cultural, language, and educational barriers; and special barriers experienced by disabled, homebound, or institutionalized persons. Figure 3 provides a framework for developing an oral health coalition.

State Oral Health Programs in Action

The **Washington** State Department of Public Health's Family and Community Health Program, with support from the Health Resources and Services Administration, has produced a manual, *Community Roots for Oral Health: Guidelines for Successful Coalitions*, which is based on the experiences of the Washington State Oral Health Coalition (WSOHC). Community education provided by the WSOHC has resulted in many successes, including increasing the number of public health dental sealant programs and raising the Medicaid reimbursement rates for dental care for children. The manual includes information on how to negotiate the six steps it identifies as crucial in developing and maintaining a successful coalition: (1) assessing community readiness, (2) forming the coalition, (3) building a foundation for action, (4) reviewing systems and oral health strategies, (5) developing an oral health coalition action plan, and (6) maintaining and sustaining the coalition. (See Technical Resources, page 6–24, for information on how to obtain the manual.)

Oral Health in America: A Report of the Surgeon General calls for the use of public-private partnerships to help improve the oral health of population segments disproportionately affected by oral diseases. The report supports the use of such partnerships to build and strengthen cross-disciplinary, culturally competent, community-based efforts to incorporate oral health initiatives into other, more established health programs, such as those designed to prevent tobacco use, immunize children, promote better nutrition, and encourage the use of protective gear such as mouth guards to prevent sports injuries.[1]

Policy

Public health policy is set on a range of levels, from internal program policies to legislation. In addition to establishing departmental policies that support

Figure 3: Oral Health Coalition Framework

Coalition Membership

State Government	Community	Education	Providers	Public	Third-Party Payers	Policy	Professional Education
Departments of ▪ Public health ▪ Environmental health ▪ Education ▪ Social services ▪ Interdepart-mental steering committees	Local health departments and community clinics Local public water system managers and supervisors Business leaders Faith-based organizations	Local/regional school administration Parent and Teacher Association Association of School Nurses	Dentists Dental hygienists Physicians Nurses Hospitals Health-related professional associations	Patient care advocates Foundations Consumer advocates Organizations that promote oral health or improved quality of life	Managed care Medicaid Other public and private insurance providers	Legislators Advocates Community policy makers	Prevention Research Centers Schools of ▪ Dentistry ▪ Dental Hygiene ▪ Medicine ▪ Nursing ▪ Allied Health

Suggested Work Group Topics

Assessment Surveillance Program infrastructure Funding State plan Infants Children Adults Seniors
Tooth decay Periodontal disease Oral cancer Infection control Injury Access Evaluation Policy Education
Water fluoridation Sealant programs Population- and evidence-based interventions Communications Social marketing

Indicators of Success

- Identified stakeholders
- Written mission statement, action plans, and strategies
- Identified responsibilities for implementation
- Maintenance of membership
- Communication
- Sustainability (funding and institutionalization)
- Commitment of partner resources
- Visibility
- Evaluation
- Legislative and policy activity
- Products and impact

program maintenance, state oral health programs must have the capacity to provide accurate and timely information to policy makers and others who influence guidelines, regulations, state legislation, and community ordinances. Examples of oral health-related *Healthy People 2010* objectives with public policy implications are

- 21-9. Increase the proportion of the U.S. population served by community water systems with optimally fluoridated water from 62% to 75%.
- 21-12. Increase the proportion of low-income children and adolescents who received any preventive dental service during the prior year from 20% to 57%.
- 21-13. Increase the proportion of school-based health centers with an oral health component.

State oral health programs should also have the capacity to address policy needs concerning tobacco-related issues, infection control, access to care, and the integration of oral health into other health programs such as those that address cardiovascular disease, tobacco control, diabetes, and reproductive health.

To enhance their capacity to influence public policy, oral health program personnel should provide legislators and other policy makers with ongoing education on oral health issues. They should also nurture relationships with dental professionals, physicians, professional organizations, and other private-sector representatives capable of influencing oral health policies at any level.

The National Governors Association recently convened three policy academies to help states devise and implement policies and programs addressing the oral health care of children. Delegations from 21 states have participated in these academies, including staff members from governors' offices, state dental directors, state chronic disease directors, state legislators, state Medicaid directors, and consumers. Since returning from these academies, participants have worked on state oral health plans and a variety of initiatives:

- Policy academy participants from **Alabama** helped plan the statewide Smile Alabama! campaign, which promoted the use of case managers to deliver oral health care education to pregnant women during prenatal visits, coordinated efforts by local policy councils to develop and distribute educational materials, and developed an oral health fact sheet for legislators. Alabama also held an oral health summit in December 2001 to convince additional stakeholders to support the Smile Alabama! campaign. Two years after the governor increased Medicaid reimbursement for dental procedures, the dental outreach component of the *Smile Alabama!* campaign recruited an additional 375 dentists to serve as Medicaid providers and helped an additional 40,000 children receive dental services under Medicaid.
- Academy participants from **Colorado** helped formulate the recommendations of the Colorado Commission on Children's Dental Health, which serve as the basis for Colorado's action plan. In December 2000, the commission presented nine recommendations to the governor and General Assembly. These recommendations led to the passage of three bills and two budget initiatives during the 2001 legislative session, including legislation creating a state loan repayment program for dentists and hygienists serving in areas identified as having a shortage of health care providers, the addition of dentists and hygienists to the state health professional tax credit program, and an amendment of the state Medicaid rules to allow dental hygienists to bill Medicaid directly.

Communication

In 1994, the Department of Health and Human Services' Core Functions Working Group and Steering Committee identified 10 core functions of public health. Among these is the responsibility "to inform, educate, and empower people about health issues."[25] Health communication has an integral role in accomplishing public health goals and objectives associated with knowledge, motivation, and behavior.

In some cases, however, public health officials underestimate the skills and resources needed to effectively carry out this health communication function. As a result, public health messages tend to be generic and conveyed with little consideration of the factors that will promote or hinder communication with the intended audience.

Oral health programs need to be able to communicate successfully using a variety of strategies. Program leaders should understand the principles of health communication and be able to

- Recognize the role and limitations of communication as a potential intervention for an oral health problem.
- Determine the appropriateness and feasibility of using a communication intervention to address the problem.
- Base a communication plan on formative research of both the health concern and the intended audience.
- Ensure that the health communication intervention complements and supports other interventions being used to address the problem.

Through strategic planning, effective management, and evaluation, program leaders can minimize the risk that an oral health communication initiative will have undesirable effects and increase the chances that it will achieve its intended goals and objectives.

Health communications can be used to further oral health efforts in numerous ways, including the following:

- Promote appropriate use of the multiple sources of fluoride among health care providers and parents of young children.
- Build community-wide support for water fluoridation in nonfluoridated communities.
- Increase the number of children from low-income families who have sealants.
- Educate people about the need for regular dental care and build support for including dental care in publicly funded programs such as Medicaid and the State Children's Health Insurance Program.
- Inform policy decisions about oral health issues.

CDCynergy is a resource available to oral health programs for building capacity in health communications. For those trained in its use, this program, available as an interactive CD-ROM, provides systematic and sequential guidance and decision-making support for all stages in the development and implementation of communication activities. CDCynergy promotes accountability and the importance of evaluation throughout the communication process. Versions of CDCynergy include a general use program and programs for specific communications activities, including tobacco cessation and control. See the Technical Resources at the end of this chapter for more information on CDCynergy.

Access to Services

Although regular professional dental care is an integral part of oral disease prevention and control, many children and adults do not routinely receive such care. People at lower income and education levels are less likely to receive dental services than those at higher levels. *Healthy People 2010* includes the following oral health objectives that pertain to improving access to services:

- 21-10. Increase the proportion of children and adults who use the oral health care system each year from 44% to 56%.
- 21-11. Increase the proportion of long-term care residents who use the oral health care system each year from 19% to 25%.
- 21-12. Increase from 20% to 57% the proportion of children and adolescents under age 19 from families at or below 200% of the federal poverty level who received any preventive dental service during the previous year.
- 21-13. Increase the proportion of school-based health centers with an oral health component (developmental, no baseline data or target level set).
- 21-14. Increase from 34% to 75% the proportion of local health departments and community-based health centers (including community, migrant, and homeless health centers) that have an oral health component.
- 5-15. Increase from 58% to 75% the proportion of persons with diabetes who have at least an annual dental examination.

To improve the availability of oral health services and to increase access to those services, state programs should

- Work with partner organizations to identify and fill gaps in services for high-risk populations as well as for the population in general.
- Provide technical assistance to help local health systems develop policies that integrate oral health care into the broader health care system.
- Support training to teach nondental health care providers when to refer patients for oral care services.
- Educate state legislators about the need to use federal State Children's Health Insurance Program (SCHIP) funds to expand Medicaid coverage or provide an alternative program to cover children's dental care services.
- Educate providers and underserved populations about the coverage available through Medicaid and SCHIP.
- Implement programs to repay the school loans of dental health professionals in exchange for work in underserved areas.

In one example of a successful state effort to improve access to dental services, the Ohio Bureau of Oral Health Services works with Head Start programs on action plans to ensure that children enrolled in Head Start receive necessary dental care. In some participating programs, more than 80% of the Head Start children complete their dental treatment. In another example, the Delaware state dental program works closely with the state dental society and the Delaware Board of Dental Licensing to increase the number of dentists who accept Medicaid patients.[20]

Professional Development and Training

State program personnel should be trained in a variety of oral health areas that support the program's ability to maintain state-level program capacity and provide community-level training and technical assistance. Examples of oral health training include

- Training to enhance the capacity of state oral health program staff to perform core public health functions. Collectively, program staff should have training and expertise in epidemiology, quantitative and qualitative data collection and analysis, health education, health communications, community organizing, coalition building, public policy development and leadership, and program evaluation.
- Continuing education seminars on issues related to oral diseases such as tooth decay in early childhood, infection control, and tobacco-use prevention and cessation.
- Training for personnel in local agencies in the assessment and surveillance of oral health problems, needs, and resources; policy development; community organization; and program implementation and evaluation.

Table 3. Key Funding Variables and Estimated Capacity-Building Funding Requirements for Four Models of State Oral Health Programs

Key Funding Variables		Model #1	Model #2	Model #3	Model #4
State population		2,500,000	4,500,000	5,500,000	11,500,000
Number of *Healthy People 2010* oral health objectives targeted by the state		4	8	5	10
Number of local health departments with dental programs		1	2	20	18
Annual budget for infrastructure and capacity elements	Lower Estimate	$ 445,000	$1,027,000	$2,868,000	$3,371,000
	Upper Estimate	$ 722,000	$1,651,000	$4,449,000	$4,760,000

Source: ASTDD, 2000.

- CDC's Basic Water Fluoridation training course for engineers and oral health personnel, which includes training in the Water Fluoridation Reporting System. Those who receive this training should, in turn, train other state engineers and oral health program personnel, operators of local water systems, and health professionals.

State programs should also assess and monitor the capacity of the state oral health workforce and identify those oral health needs that go unmet. To help respond to any workforce shortages, oral health programs should work closely with their academic and professional association partners.

Funding

The Association of State and Territorial Dental Director's *Building Infrastructure and Capacity in State and Territorial Oral Health Programs*[20] includes four models for state oral health programs that illustrate estimated program funding needs for programs with various levels of program resources, various environments (e.g., state populations, state and local infrastructure, political factors), and various strategic factors (e.g., the number of *Healthy People 2010* objectives targeted by the state). The oral health program directors of the states selected as models used a standardized worksheet to determine their lower and upper budget estimates. Overall, the estimated amount needed to build sufficient program infrastructure and capacity ranged from $445,000 to $4,760,000. Table 3 illustrates the four funding estimates and a sample of the comparison factors for each of the state models.

These estimates provide a general indication of funding needs for oral health programs. However, given the variation in state and local infrastructures, program priorities, existing resources, and strategies, each state should determine the funding it requires to achieve optimal oral health for all its citizens.

National Leadership

National Agenda and Policies

CDC, along with other Department of Health and Human Services agencies, has been a major contributor to the “National Oral Health Call to Action,” a national planning process to advance oral health. (See the Technical Resources at the end of this chapter.) This initiative addresses recommendations in the Surgeon General's report on oral health.[1] The “National Oral Health Call to Action” is intended to engage communities, stimulate initiatives, and expand efforts to improve American's oral health and eliminate oral health disparities through effective collaboration among stakeholders at all levels, including patients, health care providers, communities, and policy makers. The “Call to Action” has been led by the Partnership Network Group, which includes the Office of the Surgeon General, CDC, and NIH's National Institute of Dental and Craniofacial Research (NIDCR) as well as national health, advocacy, and dental trade organizations; foundations; and other federal agencies with oral health programs.

Some of the goals of the “Call to Action” are

- To change how people perceive oral health and disease so that oral health becomes an accepted component of general health.
- To promote oral health research and education and apply scientific findings effectively to improve oral health.
- To build an effective health infrastructure that meets the oral health needs of all Americans and integrates oral health effectively into overall health and to ensure the development of a responsive, competent, diverse, and “elastic” workforce.
- To remove known barriers that prevent people from accessing oral health services.
- To use public-private partnerships to improve the oral health of population segments who suffer disproportionately from oral diseases.

When completed, the oral health plans developed or reiterated in response to the "Call to Action" should express broadly shared visions and recommend common activities that oral health programs throughout the nation can use.

Through cooperative agreements and its "Support for State Oral Disease Prevention Programs" initiative, CDC is providing support to 12 states and 1 territory to strengthen their core oral health infrastructure and capacity and to reduce inequities in the oral health of their residents through the proven strategies of community water fluoridation and school-based or school-linked dental sealant programs for children at high risk for caries. CDC is also providing this territory and 12 states with technical assistance to help them develop surveillance systems, oral health plans, oral health-related communication strategies, and program evaluation capabilities.

Forging National Partnerships

CDC, along with NIH, the Centers for Medicare & Medicaid Services, and the Indian Health Service, is responsible for coordinating efforts to achieve the *Healthy People 2010* oral health objectives. With these federal partners, CDC guides the efforts of a national oral health consortium, which also includes 12 other national, state, and local health agencies and nongovernmental organizations. Through the National Oral Health Surveillance System (NOHSS), CDC is also leading efforts to monitor state-level progress in meeting many of these objectives.

In 2002, CDC was one of four operating divisions within the Department of Health and Human Services to sign a memorandum of understanding (MOU) with the Academy of General Dentistry (AGD) to help meet the national objectives set by *Healthy People 2010*. AGD is a nonprofit organization of 37,000 general dentists whose mission is to foster the proficiency of general dentists through continuing education. The specific objectives of this effort are to

- Help develop and implement measures to improve access to dental care for low-income children and adults.
- Increase the demand for and availability of dental continuing education courses that address the oral health needs of at-risk toddlers, children with special needs, and seniors.
- Work with other health care organizations to educate health care professionals, policy makers, and the public about the relationship between oral health and general health and about the proven effectiveness of oral disease prevention measures such as the fluoridation of public water supplies, regular tooth brushing, the use of dental sealants, and tobacco-use cessation.
- Promote oral health literacy by developing appropriate materials, including curricula for schoolchildren.

CDC's current cooperative agreement with the Association of State and Territorial Dental Directors supports key activities, including the annual National Oral Health Conference, the Best Practices Project, the ongoing implementation of the National Oral Health Surveillance System, and the compilation of the State Synopses. This cooperative agreement also supported development of the report, *Building Infrastructure and Capacity in State and Territorial Oral Health Programs*.[20] As part of the process of gathering information for the infrastructure report, states were surveyed on the gaps in their infrastructure. Survey results demonstrated high needs for establishing oral health surveillance and having adequate staff with epidemiologic and other public health expertise to implement essential dental public health services. The report recommended 10 key elements that state oral health programs need to build the infrastructure and capacity to achieve the *Healthy People 2010* objectives.[20] To help states develop the core capacity to operate effective programs, CDC used these findings to structure the cooperative agreements awarded to states in 2001 and 2002 under its "Support for State Oral Disease Prevention

Programs." As a follow-up, the Best Practices Project is collecting information on the successful practices of state oral health programs, and this information will be disseminated as a series of reports.

CDC also has a cooperative agreement with Oral Health America to develop infrastructure initiatives related to oral disease prevention and health promotion. Activities include building and strengthening state and local oral health coalitions; expanding education programs to discourage the use of smokeless tobacco; getting the oral health community more involved in tobacco-use prevention and cessation efforts; increasing the number of dental sealant programs for children at high risk for caries; enhancing school-based oral health education; and expanding initiatives that address special populations, such as Special Olympics' Special Smiles and Oral Health America's Campaign for Oral Health Parity, a communications effort to raise awareness of oral health issues among policy makers, opinion leaders, and the public.

Communicating Key Messages

CDC has led national efforts to guide health professionals and consumers in the appropriate use of fluorides."Brush Up on Healthy Teeth," for example, is a CDC-led health communications program designed to provide parents with specific information related to the oral health of their young children, including appropriate use of fluoride products such as toothpaste and mouth rinses. The"Brush Up on Healthy Teeth" materials are available in English and Spanish and can be accessed at www.cdc.gov/oralhealth.

Stimulating Priority Research and Evaluation

Through the Prevention Research Centers (PRCs), CDC is supporting oral health research at the community level. The PRCs are a network of academic research centers that have cooperative agreements with CDC to conduct research on the prevention and control of chronic disease. Within the PRCs, an oral health network coordinating center helps integrate oral health prevention research into the PRCs' broad agenda; enhances collaboration with other PRCs, state health departments, schools of dentistry, and experts from other disciplines; and increases the PRCs' visibility as a resource for developing and implementing applied, community-based oral health research. Promising community-level intervention efforts currently being evaluated include approaches that seek to improve oral health and overall quality of life among the very young, the elderly, the poor, and members of some racial and ethnic minority groups.

CDC also conducts intramural research focused on issues of interest to states and communities, including cost-effectiveness analyses of prevention strategies such as community water fluoridation and school-based and school-linked sealant programs. In addition, CDC collaborates with NIDCR to conduct workshops designed to guide research initiatives. Recently, these workshops have focused on fluoride research. Information on NIDCR research programs, including those that focus on behavioral intervention studies, is available at www.nidr.nih.gov.

Working collaboratively with the states that receive CDC support for core oral health services and prevention programs, CDC has developed a framework for state program evaluation. This framework includes common indicators for evaluating program capacity and success in promoting best processes. An evaluation toolkit developed as part of this effort is available at www.cdc.gov/oralhealth/library/infrastructure.htm. (See the Technical Resources section, page 6–24.)

Promoting Science-Based Professional Development

CDC provides various training opportunities in program design, evaluation, and surveillance. One of these is a residency program in dental public health for dentists who have a graduate degree in public health from an accredited U.S. or Canadian school. Participants have the opportunity to develop their skills in areas such as surveillance, epidemiology research methods, community prevention interventions, program administration, and evaluation as they address oral health problems

through interdisciplinary efforts. Fellowships for this program are available through the Association of Schools of Public Health (ASPH)/CDC Public Health Fellowship Program. Established in 1995, this program addresses the emerging needs of public health by providing graduates of ASPH-member schools with leadership and professional opportunities at CDC and its sister agency, the Agency for Toxic Substances and Disease Registry. CDC's Public Health Prevention Services Program also offers positions with an oral health focus. In this 3-year program, participants receive two 6-month work assignments within CDC, followed by a single 2-year assignment in a state or local health department.

Since 2000, CDC, the American Association of Public Health Dentistry, the ASTDD, and HRSA's Maternal and Child Health Bureau (MCHB) have cosponsored the annual National Oral Health Conference. This conference provides an opportunity for university-based researchers and people working in dental public health to share information about promising oral health programs, the latest oral health-related research, and national-, state-, and community-level policy initiatives. Recent sessions have focused on issues such as maintaining a viable state oral health program, advancing oral health policy at the state level, obtaining community-specific oral health data, meeting dental workforce and training needs, improving the curricula of public health programs, improving Medicaid and SCHIP services for children, and evaluating school-based oral health programs.

Cultivating Sustainable Funding Streams

CDC supported and worked with the Association of State and Territorial Dental Directors on its infrastructure document, which describes the core elements and funding (Table 3) necessary for a successful oral health program. Possible funding sources for comprehensive state oral health programs include state general funds, block grants from CDC for preventive health and health services and from HRSA for maternal and child health, and other federal sources. The federal Children's Health Act of 2000 (P.L., 106-310) is another potential funding stream that authorizes grants to states and tribes for prevention programs such as community water fluoridation and school sealant programs. Public-private partnerships, as advocated by the "Call to Action," may also bring additional resources to state oral health programs and help to strengthen their relationships with private practitioners, the business community, voluntary organizations, and other public programs.

Public funding can be supplemented by private grants at multiple levels. Grantmakers in Health, a nonprofit educational organization that helps foundations and corporate-giving programs improve the nation's health, has published a bulletin about opportunities to promote oral health and the resources required to pursue those opportunities. The Robert Wood Johnson Foundation (RWJF), the largest philanthropic organization devoted to health and health care in the United States, recently reinvigorated its commitment to address the urgent oral health needs of the nation. Although a $19 million initiative to stimulate change in the dental workforce and community practice is the cornerstone of the RWJF strategy, the foundation also supports projects to promote oral health in schools, in communities, and through state programs.

Progress to Date and Future Challenges

Although progress has been made in building state oral health programs and identifying successful practices in a range of areas, much remains to be done. *Oral Health in America: A Report of the Surgeon General*[1] called for recognizing oral health as an essential component of overall health. To effectively promote oral health, state public health agencies will need to establish the infrastructure necessary to develop, deliver, and evaluate their programs. CDC is helping states to build the leadership and capacity necessary to conduct surveillance, develop state plans, work with coalitions, strengthen prevention programs, and evaluate state efforts. Resources developed to assist funded states are available on CDC's Oral Health Web site: www.cdc.gov/

oralhealth/library/infrastructure.htm. CDC continues to work with states to define performance indicators for use in evaluating the outcomes of their programs. In addition, through workshops and state visits, CDC provides technical assistance to help states develop comprehensive and robust oral health programs.

In developing approaches to improve oral health in the general population, as well as in target groups that suffer disproportionately from oral diseases, states and communities should use evidence-based strategies and model their approaches on previously successful practices that can be adapted and replicated in their communities. Public health officials can learn about effective preventive strategies through the work of the Task Force on Community Preventive Services and the Association of State and Territorial Dental Director's Best Practices Project. CDC will continue to work with ASTDD to identify program practices shown to be successful by measurable, comparable criteria. At the same time, however, we must continue to develop and evaluate promising new approaches to preventing oral disease among people of all ages. Much of this evaluation can be done through CDC's Prevention Research Centers, which can conduct oral health research at the community level. Applied research should reveal additional approaches for preventing oral disease and promoting oral health.

To more effectively monitor trends in oral disease, we need to expand surveillance efforts at the national and state levels. These expanded efforts should include periodic updating of the eight indicators in the National Oral Health Surveillance System and active participation by states in the Water Fluoridation Reporting System. The information gathered through such surveillance is essential to monitoring state and national progress toward the *Healthy People 2010* objectives. Currently, only a dozen states have used standardized methods to collect indicators of children's oral health status; such methods need to be adopted by all states if data are to be comparable throughout the nation. Each state should also create a dedicated position for an epidemiologist who can guide data collection and analyze these data. CDC can play a role in translating and disseminating this information back to the states, community planners, and public policy makers.

Finally, CDC will continue to communicate the successes of state programs as well as intervention and surveillance results to public health officials, policy makers, and the general public. We may do so by traditional methods such as disseminating guidelines and recommendations, as well as by using new technologies, including Web-based and distance-learning approaches. In conjunction with the“Call to Action,” these communication efforts can help set the national health agenda by identifying new opportunities to eliminate disparities and improve the oral health of the nation. Securing the resources to establish and maintain comprehensive state oral health programs remains a difficult challenge. However, by diligently quantifying oral health problems and needs and showing that evidence-based solutions are available, CDC and its many partners are working to meet this challenge.

Technical Resources

The resources listed below are in addition to those already cited within the chapter.

Healthy People 2010 Oral Health Objectives
www.healthypeople.gov/Document/HTML/Volume2/21Oral.htm.

The Guide to Community Preventive Services: Oral Health
www.thecommunityguide.org/oral.
A summary of this document is available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5021a1.htm.

Fluoridation
Recommendations for using fluoride to prevent and control dental caries in the United States. *MMWR Recomm Rep* 2001;50(RR-14):1-42. www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm.

Sealants
Impact of targeted, school-based dental sealant programs in reducing racial and economic disparities in sealant prevalence among schoolchildren—Ohio, 1998-1999. *MMWR Morb Mortal Wkly Rep* 2001;50(34):736-8. www.cdc.gov/mmwr/preview/mmwrhtml/mm5034a2.htm.

Evaluation
Framework for Program Evaluation in Public Health. www.cdc.gov/eval/framework.htm.

State Infrastructure
Tools to help states to plan and implement oral health promotion activities are available at www.cdc.gov/oralhealth/library/infrastructure.htm.

Several tools for building and enhancing state infrastructure are available on the Web site of The Association of State and Territorial Dental Directors. www.astdd.org.

Building Coalitions
Community Roots for Oral Health: Guidelines for Successful Coalitions. Washington State Department of Health, Community and Family Health. Available at www.doh.wa.gov/cfh/OralHealth/manuals/Roots/Roots.html or by calling 360-236-3507.

National Oral Health Planning Process
The national oral health "Call to Action" is an effort whose mission is to improve the oral health of the nation. www.nidr.nih.gov/sgr/calltoaction/index.asp.

U.S. Surgeon General's Report
Oral Health in America: A Report of the Surgeon General. www.surgeongeneral.gov/library/oralhealth.

Policy
A description of the National Governors Association Policy Academies on Improving Oral Health Care for Children is available at www.nga.org/center/divisions/1,1188,C–ISSUE–BRIEF^D–3915,00.html.

Oral Health America's annual report card on the nation's oral health, based on state-level data, is available at www.oralhealthamerica.org/Report%20Card.htm.

Communication
Information on CDCynergy, a CD-Rom that provides systematic guidance and decision-making support throughout the communication planning process, is available at www.cdc.gov/cdcynergy and www.sophe.org.

Garnering Foundation Support
Grantmakers in Health has released an issue focus bulletin that advises foundations about needs and opportunities to promote oral health. It is available at www.gih.org/usr–doc/if–oral%20health.pdf.

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Promoting Healthy Eating and Physical Activity for a Healthier Nation

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7

Promoting Healthy Eating and Physical Activity for a Healthier Nation

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Introduction

This chapter provides a framework for a comprehensive program to address the problems of poor nutrition and physical inactivity on a state or community level. While this framework is broader than any program that would be funded by CDC, it is designed to give state and local guidance in establishing a coordinated, comprehensive nutrition and physical activity program and soliciting a broad coalition of stakeholders and partners. State public health authorities are in a unique position to strengthen and coordinate efforts to improve nutrition and physical activity among Americans.

Burden of Physical Inactivity and Poor Nutrition

Overall Magnitude

The importance of proper nutrition and physical activity in reducing rates of disease and death from chronic diseases has been well established.[1-3] Poor diet and physical inactivity cause 310,000 to 580,000 deaths per year and are major contributors to disabilities that result from diabetes, osteoporosis, obesity, and stroke. The results of one study showed that 14% of all U.S. deaths in 1990 could be attributed to poor diet and activity patterns,[1] and another study linked sedentary lifestyles to 23% of chronic disease-related deaths in the United States in 1986.[2]

According to *Healthy People 2010*,[4] about 75% of Americans do not eat enough fruit, more than half do not eat enough vegetables, and 64% consume too much saturated fat. The diets of many population subgroups contain too much total fat, saturated fat, and calories but not enough of other important elements such as calcium. Low fruit and vegetable consumption and high saturated fat intake are associated with coronary heart disease, some cancers, and diabetes.[4-6]

Breast milk is acknowledged to be the most complete source of nutrition for infants and offers many benefits for mothers and babies. According to the *Department of Health and Human Services Blueprint for Action on Breastfeeding*, breastfeeding reduces the incidence or severity of childhood infections and chronic diseases such as type 1 and 2 diabetes, asthma, and childhood cancers.[7] Additional evidence suggests that breastfeeding may help prevent childhood obesity.[8] Despite recognition by the American Academy of Pediatrics that breastfeeding is the ideal method of infant feeding,[9] only 64% of all mothers in the United States initiate breastfeeding, and only 29% continue to breastfeed their infants for 6 months after birth.[4]

Regular physical activity is essential for a healthy life.[3] Physically inactive people are almost twice as likely to develop coronary heart disease as people who engage in regular physical activity.[3] Thus physical inactivity poses almost as much risk for heart disease as cigarette smoking, high blood pressure, or a high cholesterol level, but is more prevalent than any of these other risk factors.[10] People with other risk factors for coronary heart disease, such as obesity and hypertension, may particularly benefit from physical activity.[3] It also

helps older adults remain independent and enhances the quality of life for people of all ages.

Obesity or overweight status is defined by body mass index (BMI), which is derived by dividing weight in kilograms by the square of height in meters. From 1991-2000, the prevalence of obesity (defined as BMI > 30 k/m^2) among adults increased nationally, in every state, and in all segments of the population.[11-14] Obesity leads to numerous health problems, including hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, stroke, gall bladder disease, osteoarthritis, sleep apnea, respiratory problems, and some cancers (e.g., endometrial, breast, prostate, and colon cancers). Because obesity is a risk factor for several chronic diseases, the economic and social consequences of this obesity epidemic could be overwhelming.[15] While many factors have contributed to the obesity epidemic, prevention efforts should focus on helping people reduce their calorie intake and increase their physical activity. The prevalence of obesity is increasing more rapidly among children than among adults. Because a growing body of evidence suggests that breastfeeding offers protection against excessive weight gain in childhood and adolescence,[8] CDC advocates breastfeeding as a reasonable strategy for reducing children's risk of becoming overweight.

Economic and Social Costs

The economic burden of poor diet, physical inactivity, and obesity is substantial. All are significant risk factors for developing coronary heart disease, certain types of cancer, stroke, and diabetes, conditions that involve considerable medical expense as well as lost work time, disability, and premature death. In one study, the direct medical cost for diet-related manifestations of these four conditions was estimated at $33.6 billion (in 1995 dollars) and the total cost, including lost productivity because of illness and premature death, was estimated to be $70.9 billion.[16] In another study based on 1987 medical expenditure data, researchers estimated that if the more than 88 million inactive Americans over the age of 15 began engaging in regular moderate physical activity, annual national medical costs could be reduced by as much as $76.6 billion in 2000 dollars.[17] The medical costs associated with obesity are even higher: an estimated $100 billion annually based on 1995 data.[18] Taken together, inactivity and obesity accounted for 9.4% of the 1995 health care expenditures in the United States.[18] In addition to these economic costs, immeasurable costs due to social and emotional problems, both for those affected and for their friends and families, may result from inactivity- and obesity-related diseases.[19]

Disparities

The problems associated with poor diet, physical inactivity, and obesity affect most population segments; however, there are marked disparities in the impact that these problems have on various groups of people, particularly by race/ethnicity and by education level. Data from *Healthy People 2010* [4] indicate that physical inactivity, vegetable intake, breastfeeding, and weight status vary by race/ethnicity, gender, educational level, and age (Table 1).

Related *Healthy People 2010* Objectives

Healthy People 2010 [4] contains 19 objectives directly related to nutrition and breastfeeding and 15 directly related to physical activity. However, because poor nutrition and physical inactivity are associated with increased risk for many health problems, they are also mentioned in almost every other priority area. In fact, physical activity and overweight/obesity are 2 of the 10 "Leading Health Indicators" listed in *Healthy People 2010* as major health concerns in the United States.[4] The full text of *Healthy People 2010* can be found at www.health.gov/healthypeople.

Prevention Opportunities

Levels of Prevention

Because poor dietary habits and physical inactivity are associated with many adverse health outcomes, most adults and children could benefit from interventions designed to improve their eating habits and increase their activity levels. Such intervention programs fall into three general categories: health promotion, primary prevention, and secondary

Table 1. Percentages of U.S. Adults in Various Physical Activity or Nutritional Categories, Overall and by Select Sociodemographic Characteristics

	No leisure-time physical activity, 1997	Consumption of 3 or more servings of vegetables per day,* 1994–96	Breastfeeding newborn infant for 6 months, 1998	Obese (BMI > 30),† 1999–2000
Overall	40	49	29	31
Race/Ethnicity				
White	38	50	31	29
Black	52	43	19	40
Hispanic	54	47	28	34
Gender				
Men	36	64‡		28
Women	43	49‡		33
Educational level (among people 25 years of age and older)				
Less than 9th grade	73			
Grades 9–11	59		23	
High school grad	46		21	
Some college or AA	35		21	
College grad	24		40	
Family income level				
≤ 130% poverty threshold		42		
>130% poverty threshold		50		
Age groups				
18–24 years	31			
25–44 years	34			
45–64 years	42			
65–74 years	51			
75 years and older	65			

*People aged 2 years and older.
†People aged 20 years and older.
‡People aged 40–59 years.
Source: *Healthy People 2010*[4] and NHANES 1999–2000.

prevention. The goal of health promotion is to help people establish an active lifestyle and healthy eating habits early in life and to maintain these behaviors throughout their lives. The goal of primary prevention is to help people who have risk factors for chronic disease (e.g., elevated blood pressure or serum cholesterol levels) prevent or postpone the onset of disease by establishing more active lifestyles and healthier eating habits. The goals of secondary prevention are to help people who already have a chronic disease cope with and control these conditions and to prevent additional disability by increasing their physical activity and establishing more healthful eating patterns.

Socioecological Approach

To be most effective in the long run, public health programs should focus on health promotion as well as disease prevention. For example, by promoting breastfeeding to pregnant women and new mothers and supporting their efforts to breastfeed, public health organizations can help children develop healthy eating habits during infancy. Because appropriate physical activity levels and healthy eating behaviors should be instilled in childhood and maintained throughout life, prevention efforts that target older children and schools are equally important, as are interventions for adults who are inactive or have poor dietary habits even though they have not yet developed chronic diseases. All interventions should be appropriate to the target audience, and different strategies may be required to reach different segments of the population. Interventions may address individuals, institutions, communities, policies, or the environment and can be effectively implemented in various settings, such as schools, work sites, health care facilities, and places of worship.

Whatever population segment is targeted by an intervention, its members are also influenced by a social network consisting of family members, friends, colleagues, and acquaintances. Interventions have the best chance of succeeding if they are directed at all elements of this network simultaneously.[20, 21]

Increasingly, health promotion professionals are recognizing the dynamic interplay between individuals and their environments. Although lifestyle choices are ultimately personal decisions, they are made within a complex mix of social and environmental influences that can make healthier choices either more or less accessible, affordable, comfortable, and safe.[22-25]

Research has shown that behavior change is more likely to endure when a person's environment is simultaneously changed in a manner that supports the behavioral change.[21, 26] Therefore, interventions should address not only the intentions and skills of individuals, but also their social and physical environments, including the social networks and organizations that affect them.[27]

Essential Strategies

Guidelines for Comprehensive Programs to Promote Healthy Eating and Physical Activity (www.astphnd.org) is a document designed to help state and local health advocates create comprehensive nutrition, physical activity, and obesity control programs.[28] These guidelines provide recommendations in seven major areas: 1) leadership, planning/management, and coordination; 2) environmental, systems, and policy change; 3) mass communications; 4) community programs and community development; 5) programs for children and adolescents; 6) health care delivery; and 7) surveillance, epidemiology, and research.

To make the best use of scarce resources for prevention, public health agencies attempting to prevent chronic disease should use strategies that focus on highly prevalent risk factors that are modifiable through behavior change. Following are four behavior change strategies that meet this criterion. Each strategy can target one or more *Healthy People 2010* objectives.

- *Promote increases in physical activity.* Exercise provides numerous health benefits and should be promoted to the most sedentary subgroups of the population.[3]

- *Promote breastfeeding*. Breastfed children have less risk for acute diseases of infancy and early childhood and a reduced risk of developing childhood obesity.[8]
- *Increase fruit and vegetable consumption*. Higher consumption of fruits and vegetables is associated with lower incidence of several chronic diseases, including cardiovascular disease and some cancers.[4]
- *Reduce television-viewing time*. A reduction in the length of time that children and adolescents watch television may reduce the risk for obesity among young people.[29]

Physical Activity Strategies

The *Guide to Community Preventive Services* (www.thecommunityguide.org/pa) recommends five population-based strategies for increasing a population's level of physical activity.[30] These strategies include ways to achieve *Healthy People 2010* objectives that deal with moderate and vigorous lifestyle activities for adults and young people (Chapter 22).[4]

- *Community-wide campaigns.* Large-scale, highly visible, multicomponent campaigns with messages promoted to large audiences through diverse media, including television, radio, newspapers, movie theaters, billboards, and mailings.
- *Individually targeted programs.* Programs tailored to a person's readiness for change or specific interests; these programs help people incorporate physical activity into their daily routines by teaching them behavioral skills such as setting goals, building social support, rewarding themselves for small achievements, solving problems, and avoiding relapse.
- *School-based physical education (PE).* School curricula and policies that require students to engage in sufficient moderate to vigorous activity while in school PE class. Schools can accomplish this by increasing the amount of time students spend in PE class or by increasing their activity level during PE class.
- *Interventions that provide social support for physical activity in community settings.* Interventions designed to promote physical activity by helping people create, strengthen, and maintain social networks that support their efforts to exercise more; examples include exercise buddy programs and the establishment of exercise contracts or walking groups.
- *Interventions to provide people greater access to places for physical activity.* Examples include building walking or biking trails and making exercise facilities available in community centers or workplaces.

Strategies to Increase Fruit and Vegetable Consumption

High fruit and vegetable intake is associated with low dietary fat intake, and dietary fat is associated with both cancer and heart disease.[5, 6] The *Healthy People 2010* objectives related to fruit and vegetable consumption (Chapter 19) include recommendations to consume at least three servings of vegetables and two servings of fruit per day.[4] Unfortunately, less than 25% of the U.S. population consumes at least five servings of fruits or vegetables a day. To increase fruit and vegetable consumption, CDC is collaborating with the National Cancer Institute (NCI), the American Cancer Society (ACS) and three Department of Agriculture agencies to expand federal support for the national 5 A Day for Better Health Program. Resources to help health organizations promote fruit and vegetable consumption can be found at www.5aday.gov, www.5aday.com, www.5aday.gov/pdf/masimaxmonograph.pdf, and www.5aday.org/pdfs/research/health_benefits.pdf.

Strategies to Promote Breastfeeding

The *Healthy People 2010* [4] objective relating to breastfeeding (Chapter 16) states: "Increase to 75% the proportion of mothers who breastfeed their babies in the early postpartum period, increase to 50% the proportion of mothers who breastfeed their babies for at least 6 months, and increase to 25% the

proportion of mothers who breastfeed their babies for at least 12 months." Specific strategies to promote breastfeeding are outlined in HHS's *Blueprint for Action on Breastfeeding*, which can be found at www.cdc.gov/breastfeeding/00binaries/bluprntbk2.pdf. These strategies include 1) developing social support resources for breastfeeding women, 2) training health care professionals to promote breastfeeding among their patients, 3) establishing maternity care practices and policies that promote breastfeeding, and 4) establishing workplace programs and policies that promote breastfeeding.

Strategies to Reduce Television Viewing Time

On average, U.S. children 2-17 years old spend approximately 4.5 hours a day watching some kind of electronic screen, with 2.5-2.75 hours of that spent watching television.[33, 34] National cross-sectional surveys have shown a positive association between the number of hours children watch television and their risk of being overweight.[29, 31, 32] This correlation probably has several causes: television watching may displace calorie-burning physical activity, children may eat more while watching TV, television advertisements may induce children to consume more high-calorie foods and snacks, and TV viewing may reduce children's metabolic rate.[31, 35-40] Based on data from young people in grades 9-12, the *Healthy People 2010* objective regarding TV watching (in Chapter 22) states: "Increase to 75% the proportion of adolescents who view television 2 or fewer hours per school day."[4]

Few studies have explored strategies for reducing children's TV viewing, and more testing and development of such strategies is needed before firm recommendations can be made. However, school-based programs have shown promise in helping to reduce children's TV viewing by providing means for parents and children to monitor and budget the time that the children spend watching TV.[37, 39]

Interventions

Community-Based Programs

Community-based programs should use multiple approaches to provide people with the knowledge, skills, and attitudes necessary to eat a healthful diet and be physically active. These programs should work with local organizations to identify target populations[41-52] and should solicit full community participation in a comprehensive approach that addresses the physical, social, political, and cultural environments affecting community members.

Recommendations:

- Conduct community assessments to determine the dietary and exercise habits of residents, identify interventions that might help improve these habits, and identify community resources and potential partners that could help establish these interventions.
- Coordinate efforts to achieve *Healthy People 2010* objectives among various groups and agencies.
- Encourage representatives of the intended population to participate in program planning, design, implementation, and evaluation.
- Identify relevant population subgroups; attempt to understand physical activity, nutrition, and obesity from their point of view; and develop community-based strategies and programs that are relevant and acceptable to them.
- Educate the public and policy makers about the importance of supportive environments.
- Promote broad social and environmental changes that complement individual change efforts. Examples of such activities include
  - Promoting healthy food choices in away-from-home sites such as restaurants; fast-food outlets; school and work site cafeterias; vending machines; and sports, arts, and recreation venues.
  - Encouraging restaurants to label heart-healthy foods on menus and encouraging vending machine operators to include a certain percentage of choices low in fat, sodium, and sugar.

- Coordinating community resources and identifying consistent, convincing, culturally appropriate, and scientifically sound nutrition and physical activity messages delivered through health professionals, grocery stores, places of worship, schools, the media, parks and recreational facilities and programs, food service operations, and other pertinent channels.
- Improving lighting and security in public exercise areas such as walking paths (sidewalks, trails) and bike paths.
- Involving the Department of Agriculture as a key partner through programs such as WIC.
- Recruiting nontraditional partners such as food producers and retailers, bicycle-pedestrian coordinators, transportation planners, local land/urban planners, trail coordinators, violence-prevention advocates, and neighborhood associations.
- Encouraging employers to adopt policies that support physical activity and good nutrition, such as offering flex-time and providing healthy food options at work site cafeterias.
- Demonstrating model physical activity and healthy nutrition policies, procedures, and practices at the work sites of state agencies.
- Ensuring that the public health benefits of both leisure-time and transportation-related physical activity are conveyed to state transportation agencies, urban planners, building designers, and officials responsible for zoning and transportation-investment decisions.

School-Based Programs for Children and Adolescents

Coordinated school health programs have the potential to help young people adopt and maintain healthy eating and physical activity behaviors[53-56] and possibly to prevent and control obesity and other chronic diseases. Data from the National Health and Nutrition Examination Surveys (NHANES) reveal that the prevalence of obesity among U.S. children 6-19 years of age tripled in the past 20 years, to slightly more than 15%.[57,58] Information gathered through the Youth Risk Behavior Surveillance System (YRBSS) (www.cdc.gov/nccdphp/dash/yrbs/index.htm) indicates that more than a third of young people in grades 9–12 report not regularly engaging in vigorous physical activity. Meanwhile, the percentage that reported daily participation in school physical education classes declined from 41.6% in 1991 to 32.2% in 1999.[59]

School-based programs should use a coordinated school health model to

- Provide students with opportunities to engage in healthy eating and physical activity behaviors.
- Help students develop the knowledge, skills, and attitudes necessary to adopt and maintain these behaviors.
- Integrate school-based physical activity and nutrition programs with family and community life.

CDC's Division of Adolescent and School Health and Division of Nutrition and Physical Activity have helped develop several instruments to assist schools in promoting healthy eating and physical activity. These include the CDC school health guidelines for promoting healthy eating and physical activity (www.cdc.gov/nccdphp/dash/healthtopics/guidelines.htm),[60, 61] the *School Health Index for Physical Activity and Healthy Eating: A Self-Assessment and Planning Guide* (www.cdc.gov/nccdphp/dash/SHI/index.htm), [62, 63] and *Fit, Healthy and Ready to Learn: A School Health Policy Guide* (www.nasbe.org/HealthySchools/fithealthy.mgi). [64]

Recommendations:

- Use state funding to employ a full-time school health coordinator to work collaboratively with the state education department on school health issues related to nutrition and physical activity.
- Collaborate with the state department of education to employ a physical education/activity coordinator at the state department of education.

- Educate policy makers, health advocates, and the general public about the importance of requiring daily physical education classes and state-of-the-art nutrition education in the core curriculum in kindergarten through 12th grade.
- Collaborate with the state department of education to provide support, training, and technical assistance to help schools implement CDC school health guidelines for promoting healthy eating[61] and physical activity[60] and use the tools that support the implementation of these guidelines (e.g., the *School Health Index*[62, 63] and *Fit, Healthy, and Ready to Learn*[64]).
- Provide schools with the resources necessary to educate faculty and students about healthy eating and physical activity and implement curricula to promote healthy eating and physical activity.
- Encourage communities and businesses to support physical activity and nutrition programs for young people.
- Provide support, training, and technical assistance to help schools and community organizations achieve the following:
  - Create food service programs that are consistent with USDA school meal program regulations and physical education programs that are consistent with the National Standards for Physical Education.[65]
  - Create a healthy school nutrition environment in which appealing, healthy, and nutritious choices are available whenever and wherever food and beverages are offered to students.
  - Provide before- and after-school extracurricular physical activity opportunities such as physical activity clubs, intramural activities, and interscholastic sports.
  - Integrate physical activity and healthy eating into before- and after-school child care programs (e.g., extended-day programs).
  - Develop effective programs to increase the number of students walking to and from school.
  - Develop and implement school health councils, which include community representation, to guide school health programs.
  - Develop and implement effective employee health promotion programs and services.
  - Evaluate school programs in healthy eating and physical activity and make improvements where needed.

Health Care Programs

One of the roles of health care programs is to provide effective preventive services, including services related to behavioral risk-factor modification.[66] To more effectively promote physical activity and healthy eating in the communities they serve, health care systems should collaborate with community partners to create an integrated approach.

Recommendations:

- Work with health care plans to develop and use evidence-based standards of practice for delivering preventive services. At a minimum, health care plans should have standards of practice for assessing physical activity and nutrition and for assessing the effectiveness of clinical interventions. All children and adults enrolled in health care plans should have access to appropriate primary and secondary prevention care services related to physical activity and nutrition.
- Work with health care systems to ensure that their health care professionals are qualified to deliver preventive services related to physical activity and nutrition.[67, 68]
- Work with plans to develop and evaluate prompts for counseling patients about nutrition, physical activity, and body weight regulation.
- Promote policies that either require or provide incentives for health care systems to include preventive services related to nutrition and physical activity as part of their benefit packages. Examples of policies that provide such incentives include reimbursing providers for preventive care and basing a health care system's quality-of-care rating at least in part on the quality of the preventive care it provides.

- Help health care plans coordinate their preventive care activities with community efforts to promote physical activity and healthy nutrition. The collaboration of the North Carolina Prevention Partners (www.ncpreventionpartners.org) illustrates how such a coordinated effort might function.
- Work with health care systems to include nutrition and physical activity indicators in the surveillance data they collect. These indicators can be used to evaluate the effectiveness of interventions to increase physical activity or improve nutrition among patients in the system.

State and Local Infrastructure

Program Management and Administration

State health departments are uniquely positioned to lead efforts to integrate disparate programs related to nutrition, physical activity, and obesity prevention and control. The minimum staff requirements for this effort include a full-time, high-level person to coordinate the crosscutting nutrition and physical activity functions of the health department and its partners, a full-time physical activity coordinator, and a full-time nutrition coordinator. If necessary, in states with a small population, two people may perform these three roles.

Coordinators should be able to identify data sources and compile relevant information, analyze and interpret data, present findings targeted to various audiences, manage and evaluate the effectiveness of programs, make judicious economic and political decisions, and collaborate with various partners and personnel. Coordinators also need to be competent communicators so they can educate the public, their colleagues, policy makers, and the media about the importance of nutrition and physical activity. In states that do not combine coordinator functions, the physical activity coordinator should have at least a master's degree and a substantial amount of experience in a discipline related to physical activity and public health (e.g., exercise science, public health, physical education), and the nutrition coordinator should have at least a master's degree in nutrition or public health nutrition and expertise in public health nutrition.

To develop comprehensive state nutrition and physical activity programs, the staff coordinators will need regular access to state health department staff or contractors with expertise in qualitative and quantitative data collection, management, and analysis; epidemiology and surveillance; evaluation; communications; social marketing; and behavioral sciences. They should also receive regular professional development training so they can stay abreast of advances in their fields and provide up-to-date training to others.

By serving as key resources for various categorical programs, coordinators will be in a position to ensure that healthy eating and physical activity education is incorporated into in all relevant health promotion programs, including those focusing on obesity, cardiovascular disease, cancer, diabetes, oral health, tobacco, arthritis, women's health, men's health, infant health, and child and adolescent health.

Surveillance and Evaluation

Surveillance of a population's dietary practices and physical activity levels is necessary for quantifying problems, understanding the scope of these problems, identifying trends, targeting subgroups for intervention, guiding state planning, evaluating the impact of interventions, informing the public, and influencing public policy.[69-79] Validated indicators of nutrition and physical activity and the life stages for which each is appropriate are shown in Table 2. This list is partial and could be modified according to a particular health department's interests.

In addition, program-specific and community-level indicators may be useful in targeting areas for intervention and monitoring progress in meeting specific program objectives. For example, information about the food choices available at various sites in a community could be useful in planning community nutritional interventions.

Table 2. Possible Surveillance Indicators for Nutrition and Physical Activity Programs

Measure	Infants	Youth	Adults	Older Adults
Weight and height (for calculating body mass index: BMI)		X	X	X
Daily fruit and vegetable consumption (at least 5 per day)		X	X	X
Occupational physical activity (at least 4 hours per work day in a nonsitting activity)			X	
Nonoccupational physical activity (at least 1.5 hours per week)			X	X
Moderate-intensity physical activities such as walking and gardening (at least 5 days/week and 30 minutes/day)		X	X	X
Vigorous-intensity physical activities such as some sports and running (at least 3 days/week and 20 minutes/day)		X	X	
Strengthening activities (at least 2 days per week)			X	X
Participation in physical education, sports, and other school-based activities		X		
Television viewing time (less than 2 hours per weekday)		X	X	X
Breast-feeding rates (initiation, 6 months)	X			
Birth weight	X			

Physical activity indicators could include policies related to community use of school facilities after school hours or required physical education classes for high school students.

To establish or increase their capacity to carry out dietary and physical activity surveillance, states should collect data on a regular basis and incorporate existing surveys into their data collection efforts whenever possible. Examples of such surveys include the Behavioral Risk Factor Surveillance System (BRFSS) [www.cdc.gov/nccdphp/brfss] for adults, the Youth Risk Behavioral Survey (YRBSS) [www.cdc.gov/nccdphp/dash/yrbs/index.htm] for adolescents, and the Pediatric Nutrition Surveillance System (PedNSS) [www.cdc.gov/nccdphp/dnpa/pdf/pednss.pdf] for children in the WIC program. States should also consider using state- or local-level surveys that include nutrition and/or physical activity data. Because surveillance data are so essential to the success of state programs, states should 1) establish standards for data analysis and timely reporting and 2) provide training and technical assistance to help personnel in local programs collect and analyze data.

Evaluations should describe how an intervention was conducted (i.e., process evaluation) as well as how successful it was in meeting its objectives (i.e., outcome evaluation). Because it is often not possible to see a short-term change in the ultimate outcome measure, program planners may need to identify intermediate outcome measures. For example, intermediate outcomes for a nutritional intervention aimed at increasing fruit and vegetable consumption might be increased awareness of the importance of fruit and vegetable consumption. Even when

interventions have been implemented, evaluated, and shown to be successful in a prior setting, ongoing evaluation is essential to ensure that the program is working well in the current setting.

CDC is developing an evaluation plan for state nutrition, physical activity, and obesity programs. The plan focuses on state plan development and state-supported interventions and includes evaluation questions and one or more indicators or measures that will be used to answer each question. The plan also includes details of data sources, methods, and schedules for collecting data; the names of people responsible for data collection and analysis; resources needed to conduct the evaluation; and planned uses for the data collected. CDC has also published the *Physical Activity Evaluation Handbook* to help program managers evaluate physical activity programs or individual program components.[80]

Partnerships

Strategic partnerships that can serve the goals of all partners are very important in leveraging limited resources. State health departments can foster such partnerships by developing coalitions that include local health departments, other health care providers, and various partners capable of providing or supporting programs that promote better nutrition and greater physical activity. These coalitions should be as inclusive as possible and include both traditional partners, such as hospitals and national health organizations, and nontraditional partners, such as restaurants, grocery stores, and transportation agencies.

One example of a successful partnership is a collaborative effort between the New York Division of Public Health and the New York Academy of Medicine that produced The *Pocket Guide to Cases of Medicine and Public Health Collaboration* (www.nyam.org/library/publications). Available in both a print version and an on-line version, the guide describes more than 400 instances of medical and public health collaboration. Another example is the North Carolina Prevention Partners project, Building Alliances for Health Systems to Integrate Preventive Care Services (BASIC) Benefits (www.ncpreventionpartners.org). This Web-based system coordinates and displays a variety of health-related information and programs that are relevant to North Carolina.

Community coalitions are another type of partnership that proved useful in Missouri, where the Bootheel Heart Health Program provided community-based activities designed to help residents of a rural, medically undeserved area of southeastern Missouri decrease their risk for cardiovascular disease by, among other things, exercising more and eating more healthful foods.[51, 52]

State Plans

A state plan for promoting healthy diets and physical activity should describe how the comprehensive state program will coordinate multiple categorical programs that in any significant way address nutrition, physical activity, or obesity prevention. Key elements should include a surveillance system for monitoring progress; a public communication and education program focusing on all segments of the population; coordination with other programs and services (e.g., cardiovascular health, diabetes, cancer control, minority health, and aging/social services); and strategic partnerships with state and local government entities, CDC Prevention Research Centers, academic institutions, and private organizations. Potential partners for whom nutrition, physical activity, and obesity prevention are relevant underlying issues could include programs or organizations focusing on diabetes, cardiovascular disease, neighborhood safety, or livable communities. The state plan should also identify methods of working with government leaders and establish the organizational support and infrastructure necessary to promote policy-level interventions such as making communities more “activity friendly” (e.g., Safe Routes to Schools legislation in California) or providing healthy food choices (e.g., healthy vending machine policies at schools).

Policy

In addition to convincing people to be more physically active and eat a healthier diet, public health organizations should work to create environments, systems, and policies that

- Serve as passive inducements to being physically active and eating a healthy diet.
- Eliminate barriers to being active and eating a healthy diet.
- Provide explicit support, reinforcement, and inducements to making healthy choices such as taking stairs rather than riding elevators or eating fruits or vegetables instead less healthy foods.
- Change cultural and organizational norms for physical activity and body weight.
- Establish themselves as partners in planning and decision-making on environmental and policy issues that affect people's eating and physical activity habits.

Communications

Health communication efforts should have three main goals: 1) to educate the public about the importance of diet and exercise and motivate them to eat healthier and engage in more physical activity, 2) to motivate relevant groups and policy makers to create policies and environments that support healthy eating and increased physical activity, and 3) to eventually change social norms related to eating and activity. Potential audiences for communications activities might include others within the state health department and other state agencies, decision makers, health care providers, the general public, specific segments of the population, policy makers, the media, business leaders, and partners. Because each audience will have different concerns and "cultures," health communicators will need to be adept at defining their various audiences and at designing culturally appropriate communications strategies and messages for each. The CDCynergy program (www.cdc.gov/cdcynergy) can assist states in planning communication activities.[81]

Because eating and exercise habits are complex behaviors linked to larger social, cultural, political, economic, and environmental factors, health communication activities should be part of a larger plan that addresses these other factors. Social marketing provides a useful framework for such a broad approach to health communications. Resources on social marketing can be found at http://socialmarketing-nutrition.ucdavis.edu/home.htm, www.turningpointprogram.org/Pages/socialmkt.html, and www.hc-c.gc.ca/hppb/socialmarketing.

Health communication messages should be as specific as possible (e.g., "Eat 5 a Day" rather than "Eat a Healthy Diet"). Because members of the general public cannot be expected to know what terms like "healthy diet" and "moderate physical activity" mean, program planners and health communicators should determine how their audiences perceive such concepts and define them more clearly if research shows this to be necessary. Research should include formative research (e.g., focus groups), pretesting of concepts and messages, and monitoring during the implementation of the program.

The California Nutrition Network (www.dhs.ca.gov/cpns/network/index.html) offers an example of how states can design appropriate materials for specific populations. For several years, this group has produced social marketing campaigns that focus on the dietary habits of various target populations.

On a national level, CDC's Nutrition and Physical Activity Communication Team used market analysis and consumer research to develop the Personal Energy Plan (PEP), a 12-week self-directed work site program to promote healthy eating and moderate physical activity. The program materials include workbooks (which were given only to employees who indicated a desire to change), a coordinator's kit, promotional brochures, and posters. Additional information regarding the PEP program can be found at www.cdc.gov/nccdphp/dnpa/pep.htm.

Professional Development

Staff should be familiar with recent scientific research related to nutrition and physical activity, as well as with current guidelines about what constitutes healthful dietary and physical activity behaviors. At a minimum, those who work with surveillance data should be familiar with current technology related to the measurement of these behaviors and associated environmental indicators. Those who work with programs may require training on behavioral and environmental motivators, program development and partnering strategies, program evaluation, social marketing, and communications. To keep their personnel up to date, states should take maximum advantage of training opportunities provided by CDC, partner agencies, and professional associations. Networking with members of nutrition and physical activity programs in other states is another way for program personnel to stay abreast of new developments in their field.

Examples of training opportunities in physical activity include the Physical Activity and Public Health Courses. This series includes the 6-day Public Health Practitioner's Course on Community Interventions, the 8-day postgraduate course on Research Directions & Strategies conducted annually by the University of South Carolina, and the national 5-A-Day training conducted twice yearly by NCI and CDC. Various national organizations also offer opportunities for professional development in areas related to physical activity and nutrition. Such organizations include the American College of Sports Medicine; the American Alliance of Health, Physical Education, Recreation and Dance; the Society for Public Health Education; the Society for Nutrition and Education; the American Public Health Association; the Social Marketing for Public Health Conference; and the American Dietetic Association. The Web site of CDC's Division of Nutrition and Physical Activity (DNPA) [www.cdc.gov/nccdphp/dnpa] provides information on CDC-funded research and practices in these areas. DNPA also offers monthly nutrition and physical activity teleconferences. National training resources on obesity include health care provider training by the Centers for Obesity Research and Education (www.uchsc.edu/core/index.htm) and weight management training for dietitians provided by the Commission on Dietetic Registration (www.cdrnet.org/whatsnew/certificateofTraining.htm).

Funding

State health departments need substantial resources to implement and evaluate comprehensive statewide nutrition and physical activity programs. They can do so, however, by using resources creatively and coordinating these programs with related chronic disease programs. The Healthy Hawaii Initiative (HHI), for example, uses tobacco settlement funds not only to control tobacco use but also to address other chronic disease risk factors, including poor nutrition and physical inactivity. Detailed information about the HHI can be found at http://mano.icsd.hawaii.gov/doh/resource/hhi-plans/index.html. A breakdown of how the HHI allocated the $9.6M it received for FY 2001 is presented in Table 3. This program also illustrates how a public health agency can promote public health by funding strategic partners rather than by providing services directly to the public. By focusing on education, using a broad-based approach, and leveraging its resources with the help of capable partners, the HHI was able to reach many segments of the population and ultimately provide more effective long-term preventive services.

National Leadership and Partnerships

CDC is committed to providing national leadership to support state-level public health programs and has developed strategic partnerships with national health agencies and other organizations committed to promoting healthy nutrition and increased participation in physical activities. Web sites for organizations that can serve as partners for nutrition and physical activity programs are listed in Table 4.

Progress to Date and Challenges Ahead

Although CDC's Division of Nutrition and Physical Activity (DNPA) has formally been in existence only

Table 3. Allocation of Resources, Healthy Hawaii Initiative, Fiscal Year 2001

Component	Activities	Amount
School-based programs	Establish health and physical education content standards in schools statewide, K-12.	$2,850,000
	Fund 16 schools to pilot a coordinated school health program that targets physical activity, nutrition, and tobacco.	$750,000
Community-based initiatives	Implement various competitive targeted interventions.	$1,000,000
Professional and public education	Implement a social marketing and public awareness campaign to promote physical activity and good nutrition and to discourage tobacco use.	$1,000,000
Tobacco counter-marketing	Supplement CDC funding for tobacco counter-marketing.	$800,000
HI Outcomes Institute	Partner with the University of Hawaii to create a neutral, credible, single point of access to integrate, analyze, and share data and provide professional development in the areas of assessment and evaluation.	$3,200,000
Total		**$9,600,000**

since 1999, it has made substantial progress in developing effective nutrition and physical activity strategies for preventing obesity and other chronic diseases. The physical activity chapter of the *Guide for Community Preventive Services* recommends several evidence-based strategies for increasing physical activity such as placing prompts that encourage people to use stairs rather than elevators, increasing the number and intensity of physical education programs in schools, and providing people with greater access to recreational facilities.

Several major challenges remain. Although the dietary practices of Americans have changed substantially in the past 20 years, none of these changes has yet been causally linked to the obesity epidemic. Thus the development of effective evidence-based strategies to prevent and treat obesity through dietary changes remains a high priority. In addition, although obesity has been negatively correlated with physical activity levels and breastfeeding history and positively correlated with time spent watching television, we have only limited information about the best way to translate these findings into effective public health strategies. Thus further research and continued monitoring of existing interventions are essential in these areas as well. Furthermore, as state health departments attempt to coordinate the efforts of various categorical programs promoting physical activity and

Table 4. Potential Partners for Comprehensive State Nutrition and Physical Activity Programs

Organization	Web Site
American Academy of Pediatrics	www.aap.org/
American Alliance for Health, Physical Education, Recreation and Dance	www.aahperd.org
American Association of Public Health Physicians	www.aaphp.org
American Cancer Society	www.cancer.org
American College of Sports Medicine	www.acsm.org
American College of Preventive Medicine	www.acpm.org
American Council on Exercise	www.acefitness.org
American Diabetes Association	www.diabetes.org
American Dietetic Association	www.eatright.org
American Heart Association	www.americanheart.org
American Public Health Association	www.apha.org
Association of Schools of Public Health	www.asph.org
Association of Teachers of Preventive Medicine	www.atpm.org
Centers for Disease Control and Prevention	www.cdc.gov
Cooper Institute for Aerobics Research	www.cooperinst.org
HHS Administration on Aging Division	www.aoa.gov
HHS Office of Minority Health	www.omhr.gov
Human Kinetics Publishers	www.humankinetics.com
National Association for Health and Fitness	www.physicalfitness.org
National Heart, Lung, and Blood Institute	www.nhlbi.nih.gov
National Cancer Institute	www.cancernet.nci.hig.gov
National Institute of Diabetes, Digestive, and Kidney Diseases	www.niddk.nih.gov
National Park Service: Rivers, Trails, and Conservation Assistance Program	www.nps.gov/rtca
National Recreation and Park Association	www.nrpa.org
President's Council on Physical Fitness and Sports	www.fitness.gov
Prevention Research Centers	www.cdc.gov/prc
Society for Public Health Education	www.sophe.org
Society for Nutrition Education	www.sne.org
U. S. Department of Agriculture	www.usda.gov
U. S. Department of Education	www.ed.gov
U. S. Department of Energy	www.energy.gov
U. S. Department of Transportation	www.dot.gov
U. S. Food and Drug Administration	www.fda.gov
YMCA of the United States	www.ymca.net

healthful diets, new, more effective strategies are likely to emerge. Through multiple mechanisms and with the help of many partners, CDC stands ready to help state health agencies identify the most effective strategies for comprehensively addressing the obesity epidemic in the United States and the chronic diseases associated with it.

Web-Based Resources

Public Health Policy

www.health.gov/healthypeople*:* Provides updated information on *Healthy People 2010* objectives, leading health indicators, and national and state programs.

www.cdc.gov/nccdphp/sgr/sgr.htm*: The Surgeon General's Report on Physical Activity and Health* (1996).

www.surgeongeneral.gov/topics/obesity: *The Surgeon General's Call To Action To Prevent and Decrease Overweight and Obesity*. Provides updated information on strategies to reduce the burden caused by obesity.

www.nns.nih.gov: National Nutrition Summit. Provides highlights of accomplishments in the areas of food, nutrition, and health since the landmark 1969 White House Conference on Food, Nutrition, and Health and identifies continuing challenges and emerging opportunities for the nation in these areas; focuses on nutrition and lifestyle issues affecting people of all ages, particularly those related to the nation's epidemic of overweight and obesity.

www.cdc.gov/nccdphp/publicat.htm*:* A source for various government publications relevant to physical activity and health.

http://odphp.osophs.dhhs.gov: Provides information on public health policies and reports and on the Best Practices Initiative of HHS's Office of Disease Prevention and Health Promotion.

Surveillance, Evaluation, and Research

www.cdc.gov/nccdphp/brfss: Provides Behavioral Risk Factor Surveillance System (BRFSS) data, including state and national summaries as well as copies of current and past questionnaires.

www.cdc.gov/nccdphp/dash/yrbs/index.htm: Provides Youth Risk Behavior Survey (YRBS) data as well as copies of current and past questionnaires.

www.cdc.gov/nccdphp/dnpa/pnss.htm: Provides information collected by the Pediatric Nutrition Surveillance System (PedNSS), including data collected from health, nutrition, and food assistance programs for infants and children.

www.cdc.gov/nccdphp/dnpa/physical/handbook/index.htm*: Physical Activity Evaluation Handbook*. Provides tools for state and local agencies and community-based organizations that are evaluating physical activity programs.

For additional information on how to conduct evaluations of health programs, see www.cdc.gov/eval.

Interventions and Program Development

http://thecommunityguide.org/pa/ Guide to Community Preventive Services. Provides recommendations for effective, evidence-based strategies.

www.cdc.gov/nccdphp/dnpa/kidswalk/kidswalk_guide.htm: Includes information on how communities can implement the Kids Walk to School Program.

www.paceproject.org: Patient-centered Assessment and Counseling for Exercise and Nutrition. Provides information on physician counseling techniques for physical activity and nutrition programs.

www.cdc.gov/nccdphp/dnpa/pahand.htm*:* Provides access to *For Promoting Physical Activity: A Guide for Community Action*.

www.cdc.gov/nccdphp/dnpa*:* The Web site of CDC's Division of Nutrition and Physical Activity.

www.cdc.gov/nccdphp/dnpa/pep.htm*:* The Web site of CDC's PEP program.

www.cdc.gov/nccdphp/dash/SHI/index.htm*:* The Web site of CDC's School Health Index.

www.state.hi.us/doh/legrpts2002/tspact_259sec27.pdf: The Web site of the Healthy Hawaii Initiative, which provides examples of community health improvement strategies in the areas of tobacco use prevention and control, physical activity, and nutrition.

www.astphnd.org: Nutrition and Physical Activity Work Group's *Guidelines for Comprehensive Programs to Promote Healthy Eating and Physical Activity*.

http://thecommunityguide.org/pa: A systematic review of the effectiveness of selected population based interventions designed to increase levels of physical activity from the Task Force on Community Preventive Services.

www.cdc.gov/breastfeeding/00binaries/bluprntbk2.pdf: *HHS Blueprint for Action on Breastfeeding, 2000*.

Communication and Social Marketing

www.cdc.gov/cdcynergy/: The Web site for CDCynergy, an interactive CD ROM that guides the user through the communications planning process.

www.hsc.usf.edu/CFH/ntcsm/: An on-line training course in social marketing from the University of South Florida.

Partnerships, Alliances, and Coalitions

www.dhs.ca.gov/cpns/index.htm*:* Describes nutrition-related partnering opportunities in California.

www.ncpreventionpartners.org*:* Describes how North Carolina used various partnerships to pursue public health goals.

www.cdc.gov/prc/glance*:* A CDC Web site that lists current Prevention Research Centers and describes some of the projects they have engaged in.

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Advancing Tobacco Control Through Evidence-Based Programs

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Overview

In the Surgeon General's report, *Reducing Tobacco Use*, former U.S. Surgeon General David Satcher noted that "Our lack of greater progress in tobacco control is more the result of our failure to implement proven strategies than it is the lack of knowledge about what to do."[1] The report provides a complete analysis of five major approaches to reducing tobacco use: educational, clinical, regulatory, economic, and comprehensive. The authors of the report concluded that the comprehensive approach, which involves the synergistic coordination of the other major approaches, has been most successful in reducing tobacco use, and that statewide comprehensive approaches were particularly effective. They estimated that if the strategies shown to be effective were fully implemented, the rates of tobacco use, both among young people and among adults, could be cut in half by 2010.[2] In an independent analysis, the Institute of Medicine (IOM) also concluded that comprehensive state tobacco control programs can reduce rates of smoking and save lives.[3]

The conclusions of the Surgeon General's report and the IOM report are thus consistent: comprehensive statewide tobacco control programs work. Recommended strategies for implementing such programs can be found in *Reducing Tobacco Use* (www.cdc.gov/tobacco),[4] as well as in CDC's *Best Practices for Comprehensive Tobacco Control Programs* (www.cdc.gov/tobacco)[5] and on the Web sites of the Task Force on Community Preventive Services (www.thecommunityguide.org)[6] and the Surgeon General (www.surgeongeneral.gov/tobacco/smokesum.htm).[7] The proven strategies discussed in these sources provide a strong foundation for action at the state level. Possible funding sources for comprehensive state tobacco control programs include money from the settlement of the states' lawsuits against the tobacco industry, state excise tax revenues, general state funds, and federal and private sources.

Burden

Tobacco use is the single most preventable cause of death and disease in the United States. Each year, it causes more than 440,000 deaths and costs the nation approximately $75 billion in medical expenses and $81.9 million in productivity losses.[8] Tobacco use is associated with cancer, heart disease, chronic obstructive pulmonary disease, and stroke—4 of the 5 leading causes of death in the United States. In 2000, an estimated 46.5 million U.S.adults (23.3%) were current smokers. The prevalence of smoking was higher among men (25.7%) than among women (21.0%). Among racial/ethnic groups, Asians (14.4%) and Hispanics (18.6%) had the lowest prevalence of adult cigarette use, and American Indians/Alaska Natives had the highest rates (36%) (Table 1).[9] Although nearly 70% of adult smokers want to quit smoking completely, only a small fraction are successful in any given year because of the highly addictive nature of tobacco use.[10]

Smoking rates among children and youth are perhaps even more disturbing than rates among adults. For example, rates among U.S. high school students increased significantly from approximately 28% in 1991 to 35% in 1999,[11] while 15% of middle school students currently use some form of tobacco (cigarettes, smokeless tobacco, cigars, pipes, bidis, or kreteks).[12] Overall, white teens are taking up

smoking at higher rates than are black and Hispanic teens.[13] Each day, more than 5,000 children or adolescents less than 18 years old try their first cigarette.[14] Although recent studies indicate that U.S. teen smoking rates may have leveled or begun to decline, they are still substantially above the goals articulated in *Healthy People 2010*.

Tobacco products other than conventional cigarettes have also had catastrophic effects on users' health. The use of smokeless tobacco has been associated with leukoplakia and oral cancer, as well as with the early indicators of these conditions, peridontal degeneration and soft tissue lesions; regular cigar use has been associated with cancers of the lungs, larynx, oral cavity, and esophagus; and the use of bidis (small, brown, often flavored tobacco cigarettes from India that are hand-rolled in tendu or tenburni leaf and secured with a string at one end) has been associated with heart disease and cancers of the mouth, pharynx and larynx, lung, esophagus, stomach, and liver. Although bidis were virtually unheard of in this country until quite recently, their popularity among young people has grown alarmingly: as of 2000, 2.4% of middle school

Table 1. Percentage of persons aged 18 years and older who were current smokers,* by selected characteristics—National Health Interview Survey, United States, 2000

	Men (n=13,986)		Women (n=18,388)		Total (n=32,374)	
Characteristic	**%**	**(95% CI †)**	**%**	**(95% CI)**	**%**	**(95% CI)**
Race/Ethnicity§						
White, non-Hispanic	25.9	(± 1.0)	22.4	(± 0.8)	24.1	(±0.7)
Black, non-Hispanic	26.1	(± 2.5)	20.9	(± 1.7)	23.2	(±1.5)
Hispanic	24.0	(± 2.1)	13.3	(± 1.6)	18.6	(±1.3)
American Indian/Alaska Native¶	29.1	(±11.0)	42.5	(±11.0)	36.0	(±8.0)
Asian**	21.0	(± 4.6)	7.6	(± 2.8)	14.4	(±2.8)
Education††						
0–12 (no diploma)	33.2	(± 2.2)	23.6	(± 1.7)	28.2	(±1.4)
≤8	*26.1*	*(± 3.1)*	*14.2*	*(± 2.2)*	*20.0*	*(±1.9)*
9–11	*37.6*	*(± 3.5)*	*30.8*	*(± 2.7)*	*33.9*	*(±2.2)*
12	*40.1*	*(± 6.8)*	*25.3*	*(± 5.1)*	*32.7*	*(±4.4)*
GED§§ diploma	50.1	(± 6.2)	44.3	(± 5.7)	47.2	(±4.3)
12 (diploma)	31.7	(± 1.9)	23.5	(± 1.4)	27.2	(±1.2)
Associate degree	21.9	(± 2.8)	20.4	(± 2.4)	21.1	(±1.8)
Some college	25.8	(± 2.1)	21.6	(± 1.7)	23.5	(±1.3)
Undergraduate degree	14.2	(± 1.7)	12.4	(± 1.5)	13.2	(±1.1)
Graduate degree	9.1	(± 1.8)	7.5	(± 1.6)	8.4	(±1.2)
Age group (yrs)						
18–24	28.5	(± 2.7)	25.1	(± 2.4)	26.8	(±1.8)
25–44	29.7	(± 1.4)	24.5	(± 1.1)	27.0	(±0.9)
45–64	26.4	(± 1.5)	21.6	(± 1.3)	24.0	(±1.0)
≥65	10.2	(± 1.3)	9.3	(± 1.0)	9.7	(±0.8)
Poverty status¶¶						
At or above	25.4	(± 1.0)	20.4	(± 0.9)	22.9	(±0.7)
Below	35.3	(± 3.2)	29.1	(± 2.3)	31.7	(±1.9)
Unknown	23.6	(± 1.8)	19.5	(± 1.4)	21.4	(±1.1)
Total	25.7	(± 0.8)	21.0	(± 0.7)	23.3	(±0.5)

* Smoked >100 cigarettes during their lifetime and reported at the time of interview smoking every day or some days. Excludes 301 respondents for whom smoking status was unknown.
† Confidence interval.
§ Excludes 287 respondents of unknown, multiple, and other racial/ethnic categories.
¶ Wide variances among estimates reflect limited sample sizes.
** Does not include Native Hawaiians and Other Pacific Islanders.
†† Persons aged >25 years. Excludes 305 persons with unknown years of education.
§§ General Educational Development.
¶¶ The 1999 poverty thresholds from the Bureau of the Census were used in these calculations.

students and 4.1% of high school students reported smoking bidis.

Smoking also poses health risks for nonsmokers as well as for those who smoke. Nearly 9 of 10 nonsmoking Americans are exposed to environmental tobacco smoke (ETS), which has been associated with lung cancer and heart disease among nonsmoking adults and with serious respiratory problems among children. In addition, substantial evidence now indicates that ETS exposure is also associated with low birth-weight and sudden infant death syndrome.

The consequences of tobacco use have become a global concern. The World Health Organization (WHO) estimates that about 4 million people die every year of tobacco-related diseases and that without effective international tobacco control programs, the annual death toll will increase to as many as 10 million by 2030, 7 million among people in developing countries.

Healthy People 2010 Objectives

Tobacco use is one of the 28 focus areas of *Healthy People 2010* and is also included in a smaller set of health priorities known as leading health indicators. For more information on the tobacco-related objectives in *Healthy People 2010*, visit www.health.gov/healthypeople. Following is a brief overview of these objectives:

27-1. Reduce tobacco use by adults.

27-2. Reduce tobacco use by adolescents.

27-3. Reduce the initiation of tobacco use among children and adolescents (developmental).

27-4. Increase the average age of first use of tobacco products by adolescents and young adults.

27-5. Increase the prevalence of smoking cessation attempts among adult smokers to 75%.

27-6. Increase the rate of smoking cessation among pregnant smokers to 30%.

27-7. Increase the prevalence of tobacco use cessation attempts by adolescent smokers to 84%.

27-8. Increase insurance coverage of evidence-based treatment for nicotine dependency.

27-9. Reduce the proportion of children who are regularly exposed to tobacco smoke at home to 10%.

27-10. Reduce the proportion of nonsmokers exposed to environmental tobacco smoke to 45%.

27-11. Increase smoke-free and tobacco-free environments in schools, including all school facilities, property, vehicles, and school events, to 100%.

27-12. Increase the proportion of work sites with formal smoking policies that prohibit smoking or limit it to separately ventilated areas to 100%.

27-13. Establish laws that prohibit smoking or limit it to separately ventilated areas in public places and work sites.

27-14. Reduce the rate of illegal tobacco sales to minors through better enforcement of laws.

27-15. Ensure that all states and the District of Columbia suspend or revoke state retail licenses of merchants who violate laws prohibiting the sale of tobacco to minors.

27-16. Eliminate tobacco advertising and promotions that influence adolescents and young adults (developmental).

27-17. Increase the percentage of adolescents who disapprove of smoking.

27-18. Increase the number of tribes, territories, and states (including D.C.) with comprehensive, evidence-based tobacco control programs (developmental).

27-19. Eliminate all state laws that preempt stronger tobacco control laws.

27-20. Reduce the toxicity of tobacco products by establishing a regulatory structure to monitor toxicity (developmental).

27-21. Increase the average federal and state tax on tobacco products.

National Leadership

Reducing rates of tobacco use requires a partnership between the federal government and states. Several federal agencies have conducted studies whose results can provide a foundation for state action, including the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the Substance Abuse and Mental Health Services Administration (SAMHSA), and the Agency for Health Care Policy and Research (AHCPR). These and other federal entities have produced and disseminated important information about the extent of tobacco use, the impact of tobacco use, and the effectiveness of various interventions to reduce tobacco use.

Surveys

Federally supported surveys of tobacco use include the Behavioral Risk Factor Survey, the National Health Interview Survey, the Youth Risk Behavior Survey, and the Youth Tobacco Survey conducted through CDC; the tobacco use supplement to the current population survey being conducted by the Bureau of Census, with support from NIH and CDC; the Monitoring the Future Study conducted through NIH; and the National Household Survey on Drug Abuse conducted through SAMHSA.

Research

The federal government also has sponsored research on the health impact of tobacco use, the determinants of tobacco use, and interventions to reduce tobacco use. Most of this research has been supported by NIH's National Cancer Institute (NCI); however, research into tobacco use has also been supported by other federal entities, including the National Institute on Drug Abuse, the National Institute of Child Health and Development, and the National Heart, Lung, and Blood Institute. Besides supporting disease-specific research, NCI has supported smoking-prevention and smoking-cessation intervention studies, including mass media and school trials and large-scale demonstration projects such as COMMIT and ASSIST. CDC also supports applied research through its Prevention Research Centers; this research focuses on identifying population segments disproportionately affected by tobacco use and on reducing or eliminating these disparities.

Programs

In addition to providing research and survey data that can help states design and implement tobacco control programs, various federal entities also directly support state programs. For example, SAMHSA implements the Synar regulation to reduce youth access to tobacco products through state-level compliance activities; the Agency for Health Care Policy and Research has published clinical practice guidelines on smoking cessation and has worked with a variety of health care organizations to ensure that the guidelines are implemented; and CDC supports several programs to prevent and reduce tobacco use, including the National Tobacco Control Program, which in FY 1999 funded efforts in all states and territories and the District of Columbia to establish core tobacco use prevention and reduction programs. CDC has also developed several educational and media programs that can be used in tobacco control efforts, including the Media Campaign Resource Center, which makes high-quality antismoking advertising materials available for use by states and organizations.

Private organizations are also playing an increasing role in tobacco control. The Robert Wood Johnson Foundation/American Medical Association's SmokeLess States program, for example, directly funds policy-focused interventions and approaches by private, nonprofit organizations. The American Legacy Foundation, an independent national public health foundation, is another important source of funding for state tobacco control programs. Created by the 1998 Master Settlement Agreement between participating states and the tobacco industry, the foundation aims to reduce rates of tobacco use and ETS exposure, reduce disparities in access to prevention and cessation services, and increase smoking-cessation rates. Although numerous

national organizations have undertaken critical activities to curb tobacco use, the success of tobacco control interventions will ultimately depend on the state and local agencies that devise and implement them.

Following is a list of some of the national organizations that can aid in state and local tobacco control efforts:

Action on Smoking and Health: www.ash.org

Advocacy Institute: www.advocacy.org

American Cancer Society: www.cancer.org

Americans for Nonsmokers Rights: www.no-smoke.org

American Heart Association: www.americanheart.org

American Legacy Foundation: www.americanlegacy.org

American Lung Association: www.lungusa.org

Agency for Healthcare Research and Quality: www.ahrq.org

Campaign for Tobacco-Free Kids: www.tobaccofreekids.org

Environmental Protection Agency: www.epa.gov

NIH's National Cancer Institute: www.nci.nih.gov

CDC's Office on Smoking and Health: www.cdc.gov/tobacco

Robert Wood Johnson Foundation/American Medical Association SmokeLess States program: www.ama-assn.org/ama/pub/category/3230.html

Substance Abuse and Mental Health Services Administration: www.samhsa.gov

Prevention Opportunities

Data from California and Massachusetts show that comprehensive tobacco control programs can substantially reduce tobacco use, and in the case of California, reduce rates of death from lung cancer and cardiovascular disease. CDC recommends that such programs should have four main goals:

- To prevent the initiation of tobacco use among young people (primary prevention).
- To help current smokers quit (secondary prevention).
- To eliminate ETS exposure among nonsmokers (primary and secondary prevention).
- To identify population groups disproportionately affected by tobacco use and eliminate these disparities (primary and secondary prevention).

Comprehensive state tobacco control programs should attempt to create "environments" in which smoking is discouraged or banned. The primary way of doing this is by supporting legislative, regulatory, and voluntary organizational restrictions on the use of tobacco, such as on how it is sold, priced, and promoted, and where tobacco products are allowed to be used. These "environmental change" efforts should be supported by tobacco use prevention, treatment, and cessation programs and efforts to prevent people from being exposed to environmental tobacco smoke.

Comprehensive state tobacco control programs should serve as a model for "cultural inclusiveness" and "cultural competency" by addressing the specific concerns of various population segments, including racial and ethnic minorities and other groups at high risk for tobacco-related diseases. They should also attempt to increase awareness of the disproportionate toll that tobacco use exacts from minorities and to convince minority advocacy groups to include tobacco control as part of their agendas.

Comprehensive state tobacco control programs should attempt to partner with any group with overlapping interests that can help them reach their goals, from national nongovernmental health organizations such the American Cancer Society, to federal agencies such as CDC or NIH, to groups representing specific local constituencies such as a PTA chapter or minority advocacy group. Partnering with local groups or community leaders is essential, especially in areas with predominantly minority populations, since these local groups and leaders can help state program officials design interventions or educational campaigns that target local residents in a culturally appropriate manner.

In *Best Practices for Comprehensive Tobacco Control Programs,* CDC recommends ways in which states can establish tobacco control programs that are comprehensive, sustainable, and accountable. Its recommendations are based largely on analyses of existing state programs, especially on those in California and Massachusetts, which were funded with revenue from state tobacco excise taxes. Although the document includes recommended funding ranges for various program components, state officials are of course responsible for funding decisions and, in making them, will have to determine what their most pressing needs are and what funds are available. CDC does, however, recommend that states implement some level of activity in each of the nine categories of programs identified in *Best Practices.* Current allocations for comprehensive state tobacco control programs range from $2.50 to more than $10 per capita; however, no state is currently implementing all of the recommended program components fully. The estimated costs of such full implementation range from $7 to $20 per capita in states with populations under 3 million, from $6 to $17 per capita in states with populations of 3 to 7 million, and from $5 to $16 per capita in states with populations over 7 million.

In *Best Practices,* CDC identifies the following nine categories of programs that should be part of any comprehensive state-level tobacco control program:

I. Community Programs to Reduce Tobacco Use

Local community programs offer a wide range of prevention activities, including engaging youth in developing and implementing tobacco control interventions; developing partnerships with local organizations; conducting educational programs for young people, parents, enforcement officials, community and business leaders, health care providers, school personnel, and others; and promoting both governmental and nongovernmental policies that promote clean indoor air, restrict access to tobacco products, foster insurance coverage for smoking-cessation treatment, and support other program objectives. In California and Massachusetts, local coalitions and programs have been instrumental in state efforts to reduce tobacco use. California spends approximately $1.00 per capita on these programs, and Massachusetts spends more than $2.50 per capita.

II. Chronic Disease Control Programs to Reduce the Burden of Tobacco-Related Diseases

Even if current tobacco use stopped, the accumulated effects of smoking would cause disease among past users for decades to come. Therefore, any comprehensive tobacco control program should include programs to prevent tobacco-related diseases and to detect them as early as possible. The following are examples of such programs, with CDC's recommended funding levels in parentheses:

- Cardiovascular disease prevention ($500,000 for building capacity and $1–$1.5 million for a more comprehensive program).
- Asthma prevention (base funding of $200,000–$300,000 and $600,000–$800,000 to support initiatives at the local level). For more information on asthma prevention, please visit www.epa.gov.
- Oral health programs ($400,000–$700,000).
- Cancer registries ($75,000–$300,000).

III. School Programs

School program activities include implementing CDC's *Guidelines for School Health Programs to Prevent Tobacco Use and Addiction,* which call for tobacco-free policies, teacher training, parental involvement, cessation services, the implementation of curricula shown to be effective by CDC's Research to Classroom Project, and the coordination of school-based tobacco control efforts with those of local community coalitions and statewide media and educational campaigns. Oregon has developed a new funding model for school programs based on these guidelines and reports from California and Massachusetts. At an annual funding level of approximately $1.60 per student, Oregon was able to provide grants to approximately 30% of its school districts. Thus, states following a funding model similar to Oregon's would need to budget roughly

$4.00–$6.00 per student in grades K–12 in order to institute programs in all school districts.

IV. Enforcement

To be effective, tobacco control policies must be vigorously enforced, particularly policies that restrict minors' access to tobacco and those that restrict smoking in public places. State enforcement efforts should be coordinated with those of the Food and Drug Administration (FDA) and the Substance Abuse and Mental Health Services Administration (SAMHSA). California and Massachusetts have addressed enforcement issues by making enforcement a required activity for all recipients of community program grants. Florida has taken a more centralized approach by having state alcoholic beverage control officers conduct compliance checks with the help of locally recruited youth in all regions of the state.

V. Statewide Programs

State tobacco control programs can support local programs by providing technical assistance in conducting program evaluations, using the media to discourage tobacco use, implementing smoke-free policies, and reducing minors' access to tobacco. Statewide organizations representing population segments disproportionately affected by tobacco use can be particularly helpful in devising and implementing interventions targeting those groups. California and Massachusetts have awarded grants to statewide organizations, businesses, and other partners that total about $0.40 to $1.00 per capita per year.

VI. Counter-Marketing

As its name indicates, counter-marketing is used to counter the marketing efforts of tobacco companies as well as subtler social forces (such as youth peer pressure) that encourage smoking. Counter-marketing can take many forms, including paid television, radio, billboard, and print advertisements; the use of media advocacy and other public relations techniques such as press releases, local antismoking events, and health promotion activities; and efforts to reduce tobacco industry sponsorship and promotion of various events (often by helping to arrange for replacement sponsors). Counter-marketing activities can be used to promote smoking cessation and discourage smoking initiation, as well as to garner public support for tobacco control interventions. Counter-marketing campaigns should be a primary activity in all states with comprehensive tobacco control programs. With funding levels ranging from less than $1.00 to almost $3.00 per capita, counter-marketing campaigns in California, Massachusetts, Arizona, and Florida can serve as models for other states.

VII. Cessation Programs

Smoking-cessation programs can yield significant health and economic benefits. Effective cessation strategies include brief advice by medical providers, counseling, and pharmacotherapy. Smoking-cessation activities of comprehensive state tobacco control programs should include establishing population-based treatment programs such as telephone cessation helplines; working to ensure that treatment for tobacco use is covered under both public and private insurance; and eliminating cost barriers to treatment for underserved populations, particularly the uninsured. Although no state is fully implementing the smoking-cessation program recommended by the Agency for Health Care Policy and Research, Massachusetts and California are implementing its basic elements, and the complete recommended program is being implemented in several large health maintenance organizations around the country.

VIII. Surveillance and Evaluation

Tobacco-use surveillance involves monitoring people's tobacco-related behaviors, attitudes, and long-term health outcomes at regular intervals. State tobacco control programs should use such surveillance activities to measure both local and statewide progress toward meeting short-term and intermediate objectives.

Through coordinated surveillance and evaluation activities, state tobacco control programs can demonstrate their accountability, monitor the implementation of program elements, and measure their impact over various periods of time. Logic models can help them to plan and report on these surveillance and evaluation activities, as well as to use surveillance and evaluation results to demonstrate the effectiveness of program activities to decision makers and to show program stakeholders what the program can accomplish over a given period of time (Figure 1).

In *An Introduction to Evaluation Planning, Implementation, and Use*, CDC's Office on Smoking and Health (OSH) recommends that tobacco control programs divide their evaluation efforts into the following six steps:

Step 1: Engage stakeholders.

Step 2: Describe the program.

Step 3: Focus the evaluation design.

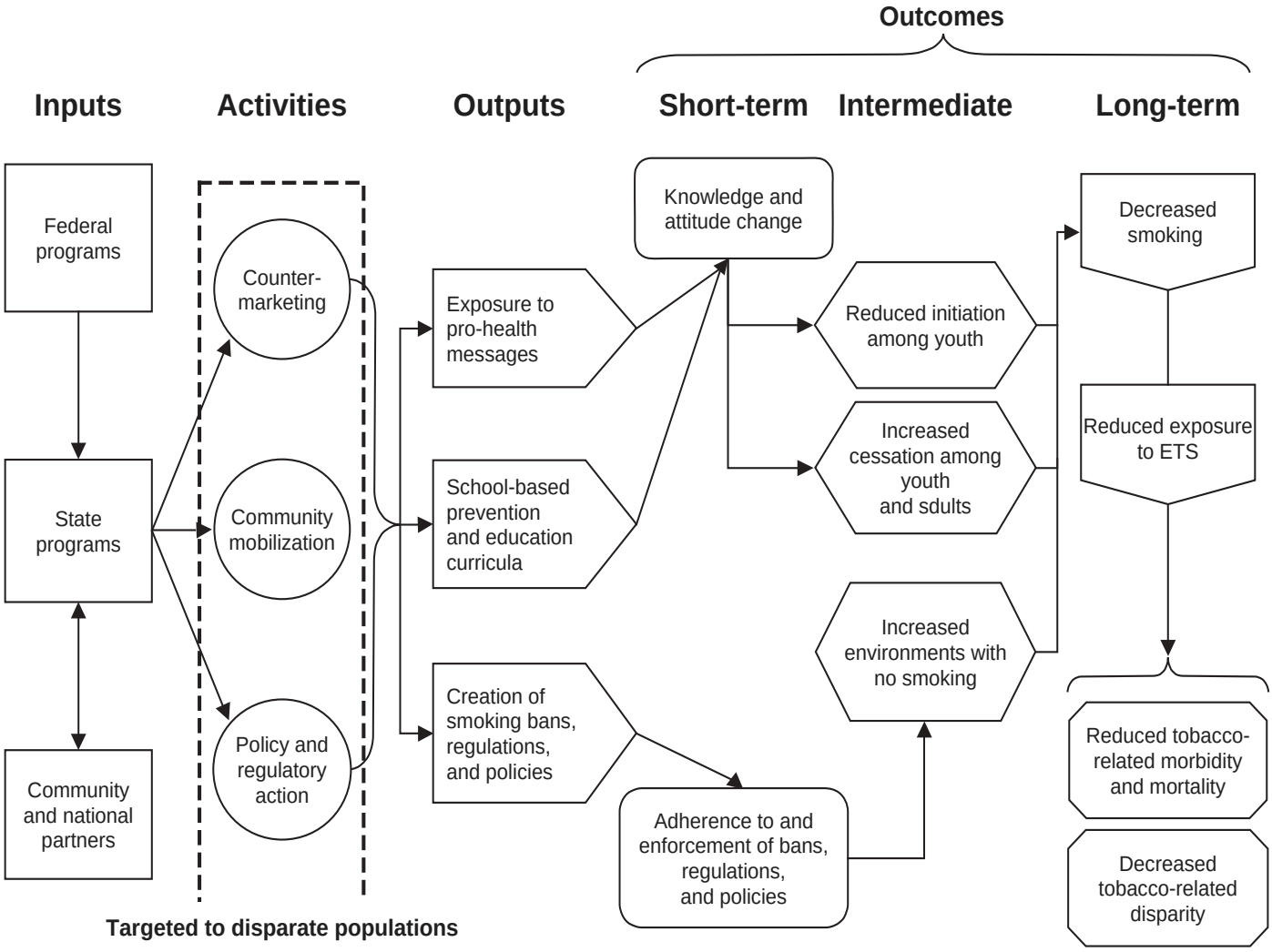
Step 4: Gather credible evidence.

Step 5: Justify conclusions.

Step 6: Ensure that evaluation findings are used, and share lessons learned.

To ensure the comparability of evaluation data from state tobacco control programs throughout the

Figure 1. Logic Model for Tobacco Use Prevention and Control



country, OSH recommends that states use surveillance systems compatible with the Behavioral Risk Factor Surveillance System (BRFSS), the Youth Risk Behavior Survey (YRBS), the Adult Tobacco Survey (ATS), and the Youth Tobacco Survey (YTS). OSH also recommends that states modify these existing systems to meet their specific needs, either by adding additional questions or survey modules, by sampling more extensively to capture local-level data, or by focusing surveillance efforts on populations with high rates of tobacco use or tobacco-related illnesses. In addition, OSH encourages states to combine traditional surveillance with the collection of data on "environmental indicators" such as state and local tobacco policies, pro-tobacco efforts, and taxes on tobacco products; to use information from a variety of sources in program planning; and to disseminate surveillance and evaluation findings in forms most appropriate for specific groups of program stakeholders.

Although state health departments should develop the capacity to manage and conduct surveillance and evaluation activities, they should also, when possible, partner with organizations capable of helping them with these activities, including universities, various health organizations, and local groups that can help them reach populations disproportionately affected by tobacco use.

OSH recommends that state tobacco control programs allocate 10% of their resources for surveillance and evaluation.

IX. Administration and Management

To be effective, state tobacco control programs will need a strong management structure to coordinate program components, involve multiple state and local agencies (e.g., health, education, law enforcement) and levels of local government, and partner with statewide voluntary health organizations and community groups. In addition, their administration and management systems must be able to prepare and implement contracts and monitor program spending and program activities. In California and Massachusetts, at least 5% of program resources were used to build program management structures.

OSH recommends that the management team of state tobacco control programs include people with expertise in program development, coordination, and management; fiscal management, including management of funding to state and local partners; leadership development; tobacco control and tobacco use prevention content; cultural competence; public health policy, including analysis, development, and implementation; community outreach and mobilization; training and technical assistance; health communications, including counter-marketing; the strategic use of both free and paid media messages; strategic planning; gathering and analyzing data (surveillance); and evaluation methods. OSH also recommends that the management team include at least seven full-time positions or their equivalent (FTEs), with the program manager and administrative support positions filled by health department personnel and the other positions filled by either health department personnel or contractors.

Professional Development

As part of its effort to provide information, resources, and training opportunities to the staffs of state tobacco control programs and their various partners, OSH sponsors or cosponsors the following regularly scheduled training activities.

Annual National Tobacco Control Conference

OSH is a primary cosponsor of this annual 2-day conference of tobacco control experts and advocates working at local, state, national, and international levels. The conference gives participants a chance to share their knowledge and experiences and to form mutually beneficial relationships with others in the field.

Annual Tobacco Use Prevention Training Institute (TUPTI)

TUPTI is a week-long multidisciplinary training and education program in which professionals working in tobacco use prevention can hone their skills in dealing with a variety of policy, management, and program issues. It also gives tobacco use prevention practitioners and researchers a chance to interact with each other and perhaps form new partnerships. TUPTI promotes interactive, adult-centered teaching and emphasizes the importance of choosing intervention models most appropriate for a particular setting. TUPTI courses, which promote a comprehensive approach to tobacco use prevention and reduction, are taught by faculty with practical or academic expertise in the field.

Annual Surveillance and Evaluation Workshop

OSH also sponsors an annual 2-day workshop where state tobacco control personnel can discuss surveillance and evaluation issues, especially those related to the Youth Tobacco Survey and the Adult Tobacco Survey. The primary purpose of this workshop is to foster consistency, collaboration, and innovation in surveillance and evaluation activities among all participants in the National Tobacco Control Program.

Training Meetings

Program managers, coordinators, and other personnel from states and other entities receiving OSH grants for comprehensive tobacco control programs have the opportunity to meet up to two times a year at OSH-sponsored training sessions on specific topics.

Audio Conferences

OSH conducts regular audio conferences each month to provide up-to-date information and facilitate information exchange among state health departments and other tobacco control partners.

Strategic Planning

To participate in OSH's National Tobacco Control Program (NTCP), state tobacco control programs must produce a 5-year strategic plan to prevent smoking initiation among youth, promote quitting among adults and youth, eliminate the public's risk for exposure to environmental tobacco smoke (ETS), and identify and target population groups disproportionately affected by tobacco use. The plan should describe the state's strategies for meeting the NTCP's four goals, include a logic model linking program activities to outputs and outcomes over time, and describe and provide a timeline for data-collection activities. The plan should also reflect all tobacco prevention and control activities in the state, complement other state health department plans to reduce rates of tobacco-related chronic diseases such as cancer and cardiovascular disease, and clearly describe how the state will collaborate with partners on various levels. During the strategic planning process, state programs should seek input from all stakeholders, especially those populations disproportionately affected by tobacco use. In addition to producing a 5-year strategic plan, state and local tobacco control programs should produce an annual action plan that identifies specific, measurable objectives and the time frames for achieving them.

By helping stakeholders in a proposed comprehensive tobacco control program jointly define their goals and objectives, the planning process can help solidify and strengthen the support for these programs.

Funding

The following summary of budgetary recommendations for each program area are from CDC's *Best Practices for Comprehensive Tobacco Control Programs*.

Community programs to reduce tobacco use: Base funding of $850,000–$1.2 million per year for state personnel and resources; $0.70–$2.00 per capita per year for local governments and organizations.

Programs to reduce the burden of tobacco-related chronic diseases: $2.8 million–$4.1 million per year.

School programs: $500,000–$750,000 per year for personnel and resources to support individual school districts; $4.00–$6.00 per student in grades K–12 for annual awards to school districts.

Enforcement: $150,000–$300,000 per year for interagency coordination; $0.43–$0.80 per capita per year for enforcement programs.

Statewide programs: $0.40–$1.00 per capita per year.

Counter-marketing: $1.00–$3.00 per capita per year.

Cessation programs: $1 per adult to identify and advise smokers about tobacco use; $2 per smoker to provide brief counseling; and the cost of a full range of cessation services including the provision of pharmaceutical aids, behavioral counseling, and follow-up support ($137.50 per program participant covered by private insurance; $275 per program participant covered by publicly financed insurance).

Surveillance and evaluation: 10% of total annual program costs.

Administration and management: 5% of total annual program costs.

Specific, detailed OSH budget recommendations for individual state tobacco control programs (for FY 1998) can be found in *Best Practices for Comprehensive Tobacco Control Programs*, which can be accessed on-line at www.cdc.gov/tobacco/research_data/stat_nat_data/bpfundmod.pdf.

Future Directions—2003 and Beyond

Over the next year, OSH will focus on four critical issues: protecting the viability of state programs, enhancing smoking-cessation services, informing the public about the dangers of new tobacco products, and providing global leadership on tobacco control.

Protecting the Viability of State Programs

In 2002, budget deficits and other political pressures caused many states to make deep cuts in their funding for tobacco control, particularly in funding derived from the Master Settlement Agreement (MSA) with the tobacco industry. Preliminary OSH estimates show that the total amount of MSA funds appropriated for (but not necessarily spent on) tobacco prevention and control fell from $600 million in FY 2002 to $430 million for FY 2003, which represents a 34% decline from the $655 million in MSA funds actually spent on tobacco prevention and control in FY 2001. History shows that these and other spending cuts could have major public health implications. Similar cuts to California's Proposition 99-funded tobacco control program caused falling tobacco use rates in California to plateau and even begin increasing in some population segments in the mid-1990s. When full funding was restored, usage rates resumed their decline. The recent history of tuberculosis (TB) control in this country provides another disturbing parallel. After successful prevention programs virtually eliminated TB as a public health threat, funding for TB control was cut during the 1990s. As a result, TB rates have crept back up, and TB is once again a major public health issue.

In 2002, even California and Massachusetts, pioneers and leaders in state-based comprehensive tobacco control, were forced to slash the budgets of their tobacco control programs. Because of its massive budget deficit, California withheld all $35 million of the MSA funds that had been set aside for the state tobacco control program for 2002-2003 and also cut the amount the program was to receive from the state's excise-tax-funded Health Education Account (from $86 million to $60 million), meaning that the program's budget was cut by $61 million. Still more drastic was the 90% budget cut in Massachusetts' tobacco control program, which saw its funding cut from $48 million to $6 million following an emergency

rescission by the governor. The impact was enormous, including an immediate shutdown of the program's paid counter-advertising campaign. The Massachusetts Department of Public Health is using its available funds to sustain the basic program-delivery infrastructure of its tobacco control program and is hoping to see funding restored in the near future.

OSH is well aware of how much effort and how many resources it takes to launch a comprehensive tobacco control program, and we know that programs must be sustained if they are to be effective. To help states sustain their programs in today's challenging economic environment, OSH is committed to intensifying its efforts to provide science-based technical assistance, materials, and other resources to help states in the areas of program planning, implementation, and evaluation. In addition to providing core funding through the National Tobacco Control Program (about $1 million per state per year), OSH is dedicated to helping states sustain and document the successes of current programs and fill critical gaps in downsized programs. OSH is also working actively with its national funding partners, including Legacy, the American Cancer Society (ACS), the Robert Wood Johnson Foundation, NCI, and SAMHSA, to ensure that the collective resources for tobacco control are used most strategically. By investing in proven strategies, rigorously monitoring the progress of their tobacco control initiatives, and continuing to support effective programs, states—working closely with OSH and other national partners—have the ability both to achieve our shared tobacco control goals and to see an impressive return on their investment in the form of a healthier population, lower health care costs, and greater economic productivity.

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Building a Healthier Future Through School Health Programs

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National Partnerships

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Building a Healthier Future Through School Health Programs

Carolyn Fisher, EdD, Pete Hunt, MPH, Laura Kann, PhD, Lloyd Kolbe, PhD, Beth Patterson, MEd, and Howell Wechsler, EdD

The Critical Need for Effective School Health Programs

In the United States, 53 million young people attend nearly 129,000 schools for about 6 hours of classroom time each day for up to 13 of the most formative years of their lives.[1] More than 95% of young people aged 5–17 years are enrolled in school. Because schools are the only institutions that can reach nearly all youth, they are in a unique position to improve both the education and health status of young people throughout the nation.

Supporting school health programs to improve the health status of our nation's young people has never been more important. Many of the health challenges facing young people today are different from those of past decades. Advances in medications and vaccines have largely reduced the illness, disability, and death that common infectious diseases once caused among children. Today, the health of young people, and the adults they will become, is critically linked to the health-related behaviors they choose to adopt. Certain behaviors that are often established during youth contribute markedly to today's major causes of death, such as heart disease, cancer, and injuries. These behaviors include

- Using tobacco.
- Eating unhealthy foods.
- Not being physically active.
- Using alcohol and other drugs.
- Engaging in sexual behaviors that can cause HIV infection, other sexually transmitted diseases, and unintended pregnancies.
- Engaging in behaviors that can result in violence or unintentional injuries.

Three of these behaviors—tobacco use, unhealthy eating, and inadequate physical activity—contribute to chronic diseases such as cardiovascular disease, cancer, and type 2 diabetes. These behaviors are typically established during childhood and adolescence, and recent trends have been alarming. Young people are clearly at risk, as the following data show:

- Every day, nearly 5,000 young people try their first cigarette.[2]
- In 2001, only 32% of high school students participated in daily physical education classes, compared with 42% of students in 1991.[3]
- Seventy-nine percent of young people do not eat the recommended five servings of fruits and vegetables each day.[4]
- Each year, more than 900,000 adolescents become pregnant,[5,6] and about 3 million become infected with a sexually transmitted disease.[7]

Rigorous studies in the 1990s showed that health education in schools can reduce the prevalence of health-risk behaviors among young people.

- Studies using a multiple-session school curriculum based on the social influences model and delivered to sixth and seventh grade students achieved significant reductions in smoking among these students through the ninth grade.[8]
- The prevalence of obesity decreased among girls in grades 6–8 who participated in a school-based intervention program.[9]

- Middle/junior high school students enrolled in the school-based Life Skills Training Program were less likely than other students to use tobacco, alcohol, or marijuana, and these effects lasted through the 12th grade (www.lifeskillstraining.com).[10]

School health programs can play a critical role in promoting healthy behaviors while enhancing academic performance. In 1998, Congress noted the opportunity our nation's schools offer when it urged CDC to "expand its support of coordinated health education programs in schools."

Healthy People 2010

Healthy People 2010 outlines 467 national health objectives, of which 107 are directed specifically toward adolescents and young adults (i.e., 10- to 24-year-olds). Among these 107 objectives, 21 are identified as "critical" on the basis of two criteria: 1) they involve critical health outcomes or behaviors that contribute to them, and 2) state-level data necessary to measure progress in meeting the objective are available or soon will be.[4]

Healthy People 2010 Critical Objectives Related to Chronic Disease Prevention Among Adolescents and Young Adults

Among the 21 critical objectives for adolescents and young adults, four relate directly to chronic disease prevention.

- *Objective 27-02:* Reduce tobacco use by adolescents.
- *Objective 27-03:* Reduce initiation of tobacco use among children and adolescents.
- *Objective 19-03:* Reduce the proportion of children and adolescents who are overweight or obese.
- *Objective 22-07:* Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 minutes per occasion.

Healthy People 2010 Objectives Related to Schools and Chronic Disease Prevention

Of the 107 *Healthy People 2010* objectives related to adolescents and young adults, 10 focus on the role of schools in improving the health of young people.

- *Objective 07-02:* Increase the proportion of middle, junior high, and senior high schools that provide school health education to prevent health problems in the following areas: unintentional injury; violence; suicide; tobacco use and addiction; alcohol or other drug use; unintended pregnancy, HIV/AIDS, and STD infection; unhealthy dietary patterns; inadequate physical activity; and environmental health.
- *Objective 07-04:* Increase the proportion of elementary, middle, junior high, and senior high schools that have a nurse-to-student ratio of at least 1:750.
- *Objective 15-31:* Increase the proportion of public and private schools that require use of appropriate head, face, eye, and mouth protection for students participating in school-sponsored physical activities.
- *Objective 19-15:* Increase the proportion of children and adolescents aged 6 to 19 years whose intake of meals and snacks at schools contributes proportionally to good overall dietary quality.
- *Objective 21-13:* Increase the proportion of school-based health centers with an oral health component.
- *Objective 22-08:* Increase the proportion of public and private schools that require daily physical education for all students.
- *Objective 22-09:* Increase the proportion of adolescents who participate in daily school physical education.
- *Objective 22-10:* Increase the proportion of adolescents who spend at least 50% of school physical education class time being physically active.
- *Objective 22-12.* Increase the proportion of public and private schools that provide access to their physical activity spaces and facilities for all persons outside of normal school hours (that is, before and

after the school day, on weekends, and during summer and other vacations).

- *Objective 27-11:* Increase smoke-free and tobacco-free environments in schools, including all school facilities, property, and vehicles, and at all school events.

Promising Practices for School Health Programs

This document describes promising practices that states should consider when planning school-based policies and programs to help young people avoid behaviors that increase their risk for obesity and chronic disease, especially tobacco use, unhealthy eating, and inadequate physical activity. These promising practices incorporate four key concepts.

1. Coordinate Multiple Components and Use Multiple Strategies.

Modern school health programs integrate the efforts and resources of education, health, and social service agencies to provide a comprehensive set of programs and services to promote health and prevent chronic diseases and their risk factors among young people. Such school health programs systematically coordinate the following eight components: 1) health services; 2) health education; 3) efforts to ensure healthy physical and social environments; 4) nutrition services; 5) physical education and other physical activities; 6) counseling, psychological, and social services; 7) health programs for faculty and staff; and 8) collaborative efforts of schools, families, and communities to improve the health of students, faculty, and staff (Figure 1).

Resources

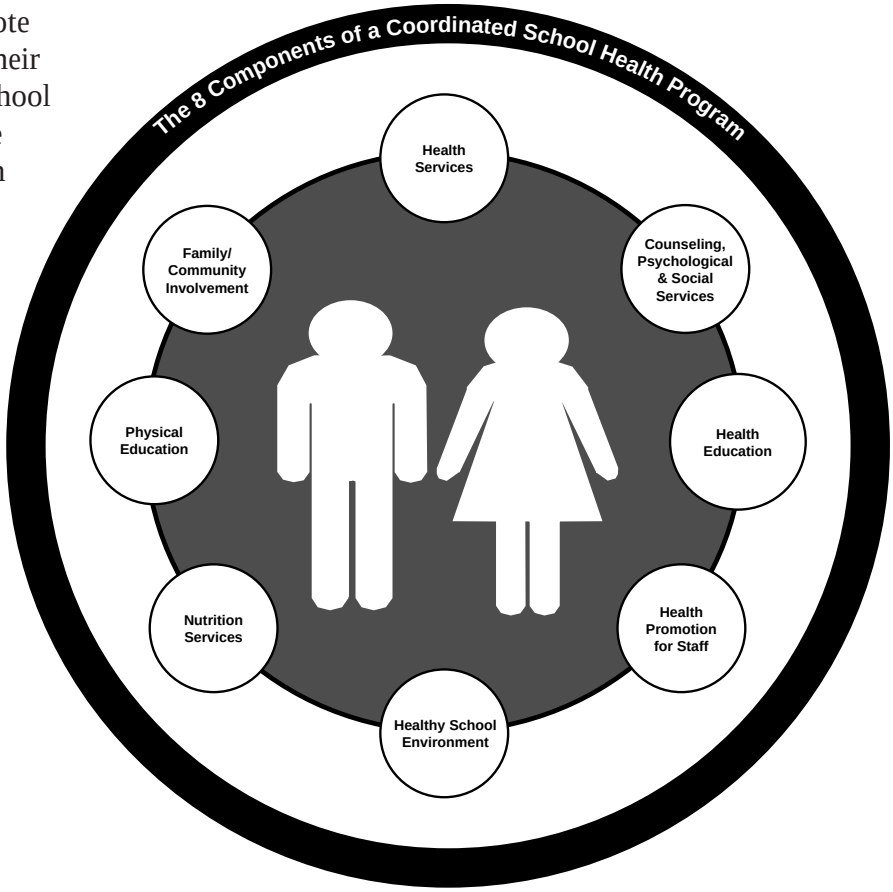
- *Building Business Support for School Health Programs.* 1999. National Association of State Boards of Education. Available from www.nasbe.org/HealthySchools.

A coordinated school health program provides a framework for school districts and schools to use in organizing and managing school health initiatives. It also provides an organizational framework for state agencies to use in planning and coordinating school health initiatives, synchronizing comparable public health and school health programs, and efficiently using multiple funding sources to improve the health and education of young people.

2. Coordinate the Activities of Health and Education Agencies and Other Organizations Working to Improve the Health of Young People.

Health and education agencies share the common goal of improving and protecting the health and well-being of young people, so collaboration should be encouraged at all levels. It is important to build a

Figure 1. A Coordinated School Health Program (CSHP)



state-level structure that supports the implementation of a coordinated approach to school health. Bringing together key resources, programs, and decision makers within a supportive structure demonstrates that school health programs are a priority and models a collaborative structure for those involved in implementing school health programs at the local level. State health and education agencies that do not have a school health coordinator position should be encouraged to establish one to facilitate communication and coordination of programs among key players.

3. Implement CDC's School Health Guidelines.

Developed after an exhaustive review of published research and with input from academic experts and national, federal, and voluntary organizations interested in child and adolescent health, CDC's school health guidelines offer specific recommendations to help states, districts, and schools implement school health programs and policies that have been found to be most effective in promoting healthy behaviors among young people.

CDC's school health guidelines emphasize multiple strategies to prevent tobacco use, promote physical activity and healthy eating, and reduce rates of obesity among young people. The guidelines also identify priorities for state decision makers to consider. Recommendations address policy development, curriculum development and selection, instructional strategies, environmental changes, direct interventions, professional development, family and community involvement, program evaluation, and linkages among components of a coordinated school health program.

A number of tools have been developed that can help schools implement the CDC school health guidelines. These include the following:

- CDC's *School Health Index for Physical Activity, Healthy Eating, and a Tobacco-Free Lifestyle: A Self-Assessment and Planning Guide.* This tool enables schools to identify strengths and weaknesses of health promotion policies and programs; develop an action plan for improving student health; and involve teachers, students, parents and the community in promoting health-enhancing behaviors and better health.
- *Fit, Healthy, and Ready to Learn: A School Health Policy Guide.* This policy guide from the National Association of State Boards of Education provides direction on establishing an overall policy framework for school health programs and specific school policies to promote physical activity and healthy eating and discourage the use of tobacco. The guide is designed for use by states, school districts, and individual schools, both public and private.
- *Changing the Scene: A Guide to Local Action.* This kit from the U.S. Department of Agriculture promotes discussion of healthy school nutrition environments at the local, state, and national levels. Tools within the kit will help school administrators, teachers, parents, school food-service professionals, and community and business leaders to work together to support changes in the school nutrition environment.

Resources

- *Guidelines for School Health Programs to Prevent Tobacco Use and Addiction. MMWR* 1994;43(RR-2). Available at www.cdc.gov/nccdphp/dash/guidelines.
- *Guidelines for School and Community Programs to Promote Lifelong Physical Activity Among Young People. MMWR* 1997;46 (RR-6). Available at www.cdc.gov/nccdphp/dash/guidelines.
- *Guidelines for School Health Programs to Promote Lifelong Healthy Eating.* CDC. *MMWR* 1996;45(RR-9). Available at www.cdc.gov/nccdphp/dash/guidelines.

4. Use a Program Planning Process to Achieve Health Promotion Goals.

The exact nature of coordinated school health programs depends on the unique needs of the school

population and on the resources available to the school and community. Having a program planning process in place is critical for program improvement and long-range planning. This process, which should involve all stakeholders, includes defining priorities on the basis of a population's unique needs, determining what resources are available, developing a strategic plan based on realistic goals and measurable objectives, and establishing processes for determining whether these goals and objectives are met and for continuously improving the program.[11]

Resources

- *Step by Step to Comprehensive School Health: The Program Planning Guide*. ETR Associates. Available at www.etr.org/pub.
- *Step by Step to Health-Promoting Schools*. ETR Associates. Available at www.etr.org/pub.

Eight Priority Actions for Improving the Health of Young People

In the remainder of this chapter, we discuss the following eight priority actions that states can take to improve the health and academic outcomes of their young people.

1. Monitor critical health-related behaviors among young people and the effectiveness of school policies and programs in promoting health-enhancing behaviors and better health.
2. Establish and maintain dedicated program-management and administrative-support systems at the state level.
3. Build effective partnerships among state-level governmental and nongovernmental agencies and organizations.
4. Establish policies to help local schools effectively implement coordinated school health programs and CDC's school health guidelines.
5. Establish a technical-assistance and resource plan that will provide local school districts with the help they need to effectively implement CDC's school health guidelines.
6. Implement health communications strategies to inform decision makers and the public about the role of school health programs in promoting health and academic success among young people.
7. Develop a professional-development plan for school officials and others responsible for establishing coordinated school health programs and implementing CDC's school health guidelines.
8. Establish a system for evaluating and continuously improving state and local school health policies and programs.

Priority 1. Monitor Critical Health-Related Behaviors Among Young People and the Effectiveness of School Policies and Programs in Promoting Health-Enhancing Behaviors and Better Health.

Conduct a statewide assessment of critical health-risk behaviors and the policies and programs designed to discourage them.

School health programs should be based on high-quality data describing the health-risk behaviors of young people and the characteristics of the policies and programs already in place to address those behaviors. The Council of State and Territorial Epidemiologists has approved the following set of adolescent health-risk indicators for inclusion in the National Public Health Surveillance System:[12]

- Cigarette smoking.
- Smokeless tobacco use.
- Consumption of fewer than five servings of fruits or vegetables daily.
- Lack of vigorous and moderate physical activity.
- At risk for being overweight.
- Overweight.
- Alcohol use.
- Binge drinking.

To obtain continuous, high-quality, comparable data for each indicator and other measures of chronic disease risk factors, states can conduct a Youth Risk Behavior Survey (YRBS) every 2 years among representative samples of 9th through 12th grade students. States can supplement the YRBS data with data from the Youth Tobacco Survey (YTS) or other

surveys assessing relevant health-related behaviors and their determinants among young people. States conducting the YRBS, YTS, or other school-based surveys can receive technical assistance from CDC in selecting the sample and implementing the survey, thus reducing the burden that multiple school-based surveys can place on schools.

To evaluate the effectiveness of school health policies and programs, states can develop School Health Education Profiles every 2 years by surveying representative samples of middle/junior high and senior high schools. These surveys provide information on local education and health policies, including tobacco-use-prevention policies, nutrition-related policies, violence-prevention policies, health education, and physical education and physical activity programs.

States should create a framework for coordinating state-level data-gathering and data-analysis activities and establish ongoing processes for selecting samples, collecting data, interpreting results, writing reports for state and local decision makers, and sharing data with agencies and organizations interested in improving the health of young people. Results from the YRBS and the profiles can be disseminated to key decision makers in both the public health and education sectors, such as state and local health officers, education administrators, school board members, legislators, and parents. CDC, in collaboration with state and local agencies, has developed tools to help states plan and conduct these important surveillance activities.

YRBS and School Health Education Profiles data can be used to describe the extent and type of health-risk behaviors among students, raise public awareness of these behaviors, set program goals, develop health education programs, monitor health education policies and programs, support professional development, and support health-related legislation.

States can also participate in national surveys that measure health-risk behaviors among young people, such as the National Youth Risk Behavior Survey, or that measure school health policies and programs, such as the School Health Policies and Programs Study (SHPPS). These surveys provide national data that can be compared with state-level data.

As an example of how state survey data can be used, every 2 years the Montana Office of Public Instruction distributes the *Montana School Health Education Profile: The Status of Health Education in Montana Schools* to state leaders, parents, and others interested in school health education. This document is used to set policy and establish priorities for improving health education programs. For more information, contact the Montana Department of Education at 406-444-1963.

Funding Estimate: CDC provides technical assistance and support to help states conduct the YRBS. CDC recommends that states appropriate about $50,000 every 2 years to complete a state-level YRBS.

Resources

- *Youth Risk Behavior Surveillance System* (YRBSS): Information about the YRBSS is available at www.cdc.gov/yrbs.
- *School Health Policies and Programs Study* (SHPPS): Information about SHPPS and sample questionnaires are available at www.cdc.gov/shpps.
- *Handbook for Conducting Youth Risk Behavior Surveys* (YRBS). Centers for Disease Control and Prevention, 2000. Contact CDC at 770-488-6170.
- *PC Sample/PC School: Survey TA Sampling Software.* Centers for Disease Control and Prevention, 2000. Contact CDC at 770-488-6170.
- *Handbook for Developing School Health Education Profiles* (SHEP). Centers for Disease Control and Prevention, 2000. Contact CDC at 770-488-6170.

Support local-level assessments of school health policies and programs.

States can support local assessments of school health policies and programs to determine their strengths and weaknesses and to identify the resources needed to successfully implement priority school health guidelines. The information can be useful to local school and community leaders in developing a strategic plan for improving the health and education of youth.

CDC's *School Health Index for Physical Activity, Healthy Eating, and a Tobacco-Free Lifestyle: A Self-Assessment and Planning Guide* can help school officials assess the strengths and weaknesses of the eight components of their school health program and of other policies and programs related to chronic disease prevention, establish priorities for improving programs, and monitor changes in processes and outcomes.

Resources

- *School Health Index for Physical Activity, Healthy Eating, and a Tobacco-Free Lifestyle: A Self-Assessment and Planning Guide.* Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2000. Available at www.cdc.gov/nccdphp/dash/SHI/index.htm.

State health and education agencies should also provide technical assistance and resources to support local-level assessment and assist schools in analyzing and using assessment results gathered through the *School Health Index* or other instruments.

Funding Estimate: While there are no state estimates for statewide use of the *School Health Index,* CDC estimates that the per-school cost of administering the *Index* should be minimal. The personnel costs for collecting and analyzing data and developing assessment reports could be borne by the school or school district.

Priority 2. Establish and Maintain Dedicated Program-Management and Administrative-Support Systems at the State Level.

State agencies collectively build the support systems to plan, implement, and evaluate fully functioning coordinated school health programs. By coordinating the allocation of new resources and using existing resources more efficiently, state agencies can help schools to meet the health needs of students and their families. To build a state-level infrastructure that supports coordinated school health programs, health and education agencies must work with other relevant state agencies such as social services, mental health, and environmental health as well as with nongovernmental organizations in the state. The heads of state government agencies must commit to supporting the process of infrastructure development. These leaders should focus on the following when developing infrastructure.

- **Personnel and Organizational Involvement:** State leaders of school health programs should identify the relevant state agencies and the personnel responsible for implementing school health-related policies and programs and should help to coordinate the delivery and use of resources for multi-agency programs related to school health.
- **Authorization and Funding:** State leaders should also 1) identify laws, directives, policies, and mandates that authorize school health programs and promote the implementation of school health guidelines at the local level and suggest new ones that may be needed; 2) obtain the funding needed to support school health programs and ensure that the funding can be used in flexible ways; and 3) establish interagency agreements to facilitate collaborative program planning and to provide resources for local school health programs.

  The search for funding sources can be complicated because coordinated school health programs cover many content areas and health problems. In addition, funding sources and application protocols change substantially from year to year.

CDC's *Healthy Youth Funding Database* provides access to an array of current information on federal, state, and private-sector funding. The easy-to-use database offers examples of how states use federal funds to support adolescent and school health programs.

Resources

- *Healthy Youth Funding Database.* CDC. Available at www.cdc.gov/nccdphp/shpfp/index.asp.

- **Technical Assistance and Resources:** State agency leaders should develop processes for identifying, developing, and disseminating resources for supporting coordinated school health programs and implementing CDC's school health guidelines at the school and district levels. They should identify existing human, data, technological, and material resources that could be used to enhance school health programs; obtain additional resources if they are needed; coordinate the use of professional development resources to improve statewide training networks; and coordinate the support provided by external partners, including institutions of higher education and philanthropic agencies.
- **Communications and Linkages:** State leaders must establish and strengthen linkages that will 1) build the state's capacity to assist in the local implementation of school health guidelines and coordinated school health programs, 2) strengthen collaborations among relevant partners, and 3) facilitate advocacy for school health programs. They should also establish communications networks to promote broad-based decision-making, to ensure that state-level policies and programs are adopted at the local level, and to promote the effective use of local school and district resources to enhance school health programs.

In addition to focusing on these important organizational supports, health and education leaders must help state school health-related staff develop the skills they need to effectively organize and manage school health programs. CDC, in collaboration with state agency staff in states funded for coordinated school health programs, has developed the *Coordinated School Health Program Infrastructure Development: Process Evaluation Manual* as a tool to help states build the necessary support for coordinated school health programs and institutionalize this support at the state and local levels.

Resources

- *Coordinated School Health Program Infrastructure Development: Process Evaluation Manual.* Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1997. Available at www.cdc.gov/nccdphp/dash/publications/index.htm.

State agencies in Wisconsin and Rhode Island have completed assessments of their organizational capacity and leadership for school health and are using the results to strengthen their infrastructure for school health. California created a consensus document, *Blueprint for Action,* to set directions for state school health programs.

In collaboration with CDC and the National Professional Development Consortium for School Health, eight school health managers from state health and education agencies drafted *Responsibilities and Competencies for Managers of School Health Programs.* The draft document identifies five key areas of responsibility for such managers (management; policy; curriculum, instruction, and student assessment; professional development and technical assistance; and surveillance) and four types of competencies that these managers need to be successful (competency in needs assessment, planning, and collaboration; in marketing, information dissemination, and communications; in program implementation; and in monitoring and evaluation). Reducing health-risk behaviors among young people is a complex effort that requires cooperation and collaboration among many partners at the state,

Resources

- *Final Report: Comprehensive School Health Program Infrastructure Needs Assessment.* Providence: Rhode Island Department of Education and Department of Health, 1996. Available at www.health.state.ri.us/disprev/hshk/home.htm.
- *Supporting School Health: An Initial Assessment of Infrastructure for Comprehensive School Health, Student Services, Prevention and Wellness Programs. Phase One, DPI Status and Dynamics.* Madison, WI: Wisconsin Department of Public Instruction, 1995.
- *Building Infrastructure for Coordinated School Health: California's Blueprint.* Sacramento: California Department of Education, 2000. Available at www.cde.ca.gov.

regional, and local levels. At the state level, structures for intra-agency, interagency, and community partnerships must be developed.

Funding Estimate: CDC recommends that states allocate an average of $200,000 per year to support key positions in the health and education agencies.

Priority 3. Build Effective Partnerships Among State-Level Governmental and Nongovernmental Agencies and Organizations.

Reducing health-risk behaviors among young people is a complex effort that requires cooperation and collaboration among many partners at the state, regional, and local levels. At the state level, structures for intra-agency, interagency, and community partnerships must be developed.

Build coordination and planning within state agencies.

State departments of health can foster the intra-agency coordination of programs that address the needs of young people (e.g., maternal and child health, chronic disease, cardiovascular health, physical activity, nutrition, tobacco control) to ensure that these programs, which are often delivered in both community and school settings, are connected and efficient.

Similarly, state departments of education can foster the intra-agency coordination of programs such as Safe and Drug-Free Schools, health education, physical education, food services, health services, and counseling and psychological services. In short, state departments of both health and education should strive to build structures that foster intra-agency collaboration and planning. Such internal partnerships allow agencies to use resources more efficiently, improve communication among staff involved with complimentary programs, and, as a result, strengthen the programs themselves.

Resources

- *Schools and Health: Our Nation's Investment.* Institute of Medicine. Washington, DC: National Academy of Science Press, 1997; 247-52.
- *Coordinated School Health Program Infrastructure: Process Evaluation Manual.* Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1997. Available at www.cdc.gov/nccdphp/dash/publications/index.htm.

Funding Estimate: Intra-agency coordinated planning does not necessitate a separate allocation; it should naturally occur as a part of effective program planning and implementation.

Promote collaboration among state agencies.

To reduce duplication of effort and maximize the use of limited state resources, leaders of state agencies should establish a school health interagency program committee. This committee's primary role would be to coordinate the management and implementation of multiple school health-related programs across agencies. State agencies can develop agreements (e.g., memoranda of understanding) that include jointly prepared plans for coordinating administrative responsibilities and activities among agencies.[13] The interagency collaboration can be coordinated and jointly led by school health leaders from the state education and health agencies. Other members

of this committee might include representatives from state agencies that address social services, justice, mental health, agriculture, substance abuse, parks and recreation, labor, economic development, and transportation, as well as representatives from the governor's office.

Such an interagency committee should not be limited to agency leaders. It should include the program staff who are responsible for promoting the implementation of school health guidelines and strengthening the delivery of services through local school health programs. The committee may take on a variety of roles and responsibilities, including the following:[14]

- Improve communication, planning, coordination, and collaboration among state agencies engaged in ongoing activities relevant to the health and academic achievement of young people.
- Identify needs and strategies for improving state leadership of school health programs.
- Identify and implement state policies and programs to facilitate quality school health programs.
- Coordinate federal, state, and philanthropic funding for school health programs awarded to state agencies.
- Help identify successful school health programs and disseminate information about them to school health officials throughout the state.
- Help coordinate health programs in private, voluntary, and post-secondary institutions.
- Prepare reports and make policy recommendations to relevant state officials.

Strong working relationships between state agencies are evident in Tennessee and Oregon. In Tennessee, for example, the state commissioners of education and health issued a joint statement on school health that resulted in the formation of a working group with members from each agency. As a result of this group's efforts, the agencies executed a memorandum of agreement that established a permanent working relationship between the two agencies and addressed all components of the Tennessee Coordinated School Health Program.

The Oregon Coordinated School Health Initiative is steered by the Blueprint Working Group, which is responsible for guiding the development of the Coordinated School Health Blueprint for Action. This 5-year strategic plan will outline the priority state and local actions to

- Build infrastructure for coordinated school health programs.
- Strengthen the components of coordinated school health programs.
- Address key health-risk behaviors among children and adolescents.

The Blueprint Working Group is made up of state agency program coordinators responsible for the various components of a coordinated school health program and health-related risk factors among children and adolescents. Members of the working group from the Oregon Department of Education include the coordinated school health program director, an HIV prevention specialist, the director of federal programs, a physical education specialist, a child nutrition programs specialist, the juvenile corrections director, a school counseling specialist, and a safe and drug-free schools specialist. Members from the the Oregon Department of Health include the coordinated school health program director, the adolescent health manager, Tobacco Program staff, Cardiovascular Health staff, School-Based Health Program staff, Immunization Program staff, the YRBS coordinator, Environmental Health staff, Family Planning/Teen Pregnancy Prevention staff, and Asthma Program staff. The working group also includes representatives from the Oregon Office of Alcohol and Drug Abuse Program, including staff from the Governor's Council on Alcohol Tobacco and Other Drugs, and the Youth Development Director from the Oregon Commission on Children and Families.

Funding Estimate: CDC recommends that states allocate approximately $5,000 per year to support state interagency program committee activities, including monthly meetings and the production and dissemination of materials and documents to the legislature, government agencies, schools, and others.

Establish a state school health coordinating council.

To expand access to school health resources and coordinate efforts of the larger community interested in improving the health of students, states can establish a school health coordinating council.[10] This council can include representatives from the interagency program committee; health and education leadership organizations such as the state school boards association; nongovernmental organizations such as the American Cancer Society; and associations representing health education, physical education, health care providers, post-secondary institutions, businesses, and community health coalitions, as well as parents and students.

States should establish policies and guidelines that will clearly define the roles and responsibilities of the school health coordinating council in establishing priorities for state school health programs. These roles and responsibilities could include the following:

- Developing statewide consensus on key issues related to school health programs and policies and communicating these issues to the interagency program committee.
- Showcasing effective and innovative coordinated school health programs for multiple audiences, including the state legislature.
- Conveying a clear vision of the role of school health programs in improving the health and academic achievement of students. Councils might convey this vision by developing consensus statements about the correlations between participation in such programs and academic success, by identifying and reducing the barriers to collaboration among state organizations concerned with the health and well-being of children and adolescents, or by integrating programs across agencies and organizations.
- Proposing appropriate state policies and legislation and helping school districts and schools implement the school health guidelines by disseminating resources such as the *School Health Index*.

The Rhode Island School Health Advisory Council was formed as a primary partner in the state's comprehensive school health initiative, *Healthy Schools! Healthy Kids!* The council comprises approximately 150 members representing various constituency groups concerned with changing health priorities, including representatives from state government, the state chapter of the American Academy of Pediatrics, hospitals, schools, community groups, colleges and universities, and various heart, lung, and cancer associations. The council developed Rhode Island's *Healthy Schools! Healthy Kids! Plan for Comprehensive School Health* and continues to implement the recommendations in the plan and to help identify new and emerging health priorities in school health.

Funding Estimate: CDC recommends that states allocate approximately $10,000–$25,000 per year to support a state school health coordinating council. These funds can support travel of non-state agency members, meeting facilities for four meetings per year, and the production of materials and documents for dissemination to the legislature, government agencies, schools, and others. Funds for the council could be allocated separately or could be included as a line item in a program budget to specifically address chronic disease risk reduction.

Priority 4. Establish Policies to Help Local Schools Effectively Implement Coordinated School Health Programs and CDC's School Health Guidelines.

States use laws, policy statements, and administrative regulations to articulate their expectations and recommendations for school health programs and the important role that schools have in improving the health of young people.[14] State agency leaders can establish policies to support local implementation of the school health guidelines and programs. In addition, state education and health agencies can provide model implementation policies to local school districts. This option is especially important in states that have minimal legislative mandates for school health. Model policies should be developed in cooperation with the state's board of education and association of school boards.

The National Association of State Boards of Education (NASBE), in cooperation with the National School Boards Association (NSBA), has developed *Fit, Healthy, and Ready to Learn*, a school health policy guide that translates CDC's school

Resources

- *Fit, Healthy, and Ready to Learn: A School Health Policy Guide.* National Association of State Boards of Education. Washington, DC: NASBE, 1999. Available at www.nasbe.org/HealthySchools/nasbepubs.mgi.
- *Changing the Scene, Improving the School Nutrition Environment: A Guide to Local Action.* U.S. Department of Agriculture, Food and Nutrition Service, 2000. Available at www.fns.usda.gov/tn/Healthy/changing.html.

health guidelines into model policy language.[15] This document can help guide policy development at the state, district, and school levels. It also contains a wealth of information that can guide state health leaders through the process of creating educational policy.

State school health policies typically are enacted or adopted by either the state legislature, the state board of education, or state commissions. Some regulations that have the force of policy can be adopted by the state education agency, which typically is also responsible for implementing state school health policies. The state health department can provide data and testimony to help guide the development of state school health policies. Following are some of the issues that these state-level policies can address.

The formation of school health councils and placement of school health coordinators at the district level.

Some school boards delegate oversight authority on specified health-related issues to a school health coordinating council that includes parents and community representatives. This council might operate as a standing committee of the board or as a distinct body. It might simply be an advisory body or might have authority to enhance program coordination among staff members working in the various school health components. When such a council is active and has real influence, it is a natural forum for involving outside professionals—such as physicians, law enforcement officers, media representatives, and university faculty members—with the school district. Virginia and Texas require districts to have school health councils.

The size of a superintendent's staff depends on the size and the resources of the district. A district may or may not have school health program coordinators who provide guidance and technical assistance to school personnel. If they are present, such staff members are natural points of contact for outside professionals who want to work with schools.

Resources

- *Improving School Health: A Guide to the Role of the School Health Coordinator.* Atlanta: American Cancer Society, 1999. Available at www.schoolhealth/info.
- *Improving School Health: A Guide to School Health Councils.* Atlanta: American Cancer Society, 1998. Available at www.schoolhealth/info.
- *Promoting Healthy Youth, Schools, and Communities: A Guide to Community-School Health Advisory Councils.* Des Moines: Iowa Department of Public Health, 1999. Available at www.idph.state.ia.us/fch/fam_serv/advisory.htm.

Instructional delivery and curricula content.

State education agencies and local school districts may use the National Health Education Standards, which are based on health education theory and practice, to establish curriculum frameworks and standards. These standards provide a framework for decisions about which lessons, strategies, activities, and types of assessment to include in a health education curriculum. Health education curricula based on the national standards can foster universal health literacy, which the Joint Committee on National Health Education Standards defines as the ability to obtain, interpret, and understand basic health information and services and to use such information and services to improve one's health.

Resources

- *National Health Education Standards: Achieving Health Literacy.* Joint Committee on National Health Education Standards. Atlanta: American Cancer Society, 1995. Available at www.aahperd.org/aahe/natl_health_education_standards.html.
- *Moving into the Future: National Standards for Physical Education.* National Association for Sports and Physical Education. Washington, DC : NASPE, 1995. Available at www.aahperd.org/naspe/publications-nationalstandards.html.

Resources

- *School Health: Findings from Evaluated Programs. 2nd ed.* U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Washington, DC: DHHS, 1998.
- *Safe and Drug-Free Schools Program. Principles of Effectiveness.* U.S. Department of Education. Federal Register. Vol. 63, No. 104, 1998:29902–6. June 1, 1998. Available at www.ed.gov/legislation/FedRegister/announcements/1998-2.
- *Exemplary and Promising Safe, Disciplined and Drug-Free Schools Programs.* U.S. Department of Education, Office of Special Educational Research and Improvement and Office of Reform Assistance and Dissemination. Washington, DC: DoE, 2001.
- *Health Framework for California Public Schools Kindergarten Through Grade Twelve*. California Department of Education. Sacramento: Calif. DoE, 1994.

Student and staff performance standards.

State boards of education, state school boards associations, and public health boards can set learning standards for health education and physical education. These standards can serve as the basis for local school health education and physical education programs and the development of performance standards for teachers. Many states have developed student performance standards that are either based on or aligned with national health- and physical-education standards.

Specifications for a healthy school nutrition environment.

State boards of education can adopt policies that limit the number of times that students have access to food and beverages in vending machines at school or that set specific nutritional quality standards for the types of food and beverages available on campus, including those in vending machines. In West Virginia, the state board of education adopted a nutrition policy for the types of foods available in school vending machines that is one of the strongest in the nation.

Tobacco-free schools.

A tobacco-free environment, as defined by CDC, means tobacco use is prohibited on school property, including buildings, grounds, and vehicles, and at school-sponsored events on and off school property. This rule applies to students, staff members, and visitors. Policies that ensure a tobacco-free environment can be adopted at the school, district, or state level. At the state level, these policies are generally enacted as law by the state legislature, but some states have empowered their state boards of education with the authority to mandate policies that affect districts and schools. States with tobacco-free school policies include Alabama, Arizona, Arkansas, California, Colorado, Hawaii, Mississippi, New Mexico, New York, Ohio, Texas, Utah, Washington, and West Virginia.

Procedures for monitoring and enforcing tobacco-free schools policy can also be established at the local or state level. For example, a state department of education may require districts to report tobacco-use violations; a local school board might require a progressive discipline plan for student policy violations that begins with an educational

Resources

- *Fit, Healthy, and Ready to Learn: A School Health Policy Guide.* National Association of State Boards of Education. Washington, DC: NASBE, 1999. Available at www.nasbe.org/HealthySchools/fithealthy.mgi.
- *Creating and Maintaining a Tobacco-Free School Policy.* Partnership for a Tobacco-Free Maine, Department of Human Services. Augusta, ME: 2000. Available at www.tobaccofreemaine.org.
- *Tobacco-Free School Policy Guide.* Available from the Office of Public Instruction, P.O. Box 202501, Helena, MT 59620-2501.
- *Guidelines for Implementation of West Virginia Board of Education Policy 2422.5A: Tobacco Control.* Available from the West Virginia Department of Education, 1900 Kanawaha Blvd. East, Charleston, WV 25305-0330.

intervention. The National Association of State Boards of Education and a number of state and local education and health agencies have produced guidelines for implementing tobacco-free school policies.

Quality professional development of school health staff.

State boards of education can set professional development requirements for school health program staff and other personnel who implement health programs in schools. For example, Maine decided to focus on middle school students as part of its efforts to reduce tobacco addiction rates among teens and young adults. All of the state's middle school teachers were offered professional development in Life Skills Training, a program to help teens develop healthy personal and social skills. Since the program began in 1997, smoking among Maine high school students has dropped more than 20%. Increases in the state excise tax and new community-based programs also contributed to this decrease. (For more information about the importance of professional development, see Priority 7.)

Appropriations to fund school health programs.

States can enact legislation that establishes appropriations to support

- Hiring school health coordinators, physical education teachers, health education teachers, school counselors, or school nurses in all school districts.
- Assessing local school health standards, policies, and programs.
- Providing professional development for school staff responsible for delivering school health programs and implementing school health guidelines.
- Ensuring that young people have access to facilities that promote physical activity.

Funding Estimate: Although the cost of developing and enacting state-level policies will be minimal, the implementation of these policies may require additional appropriations for materials and resource development or professional development specific to a new program priority. In these cases, funds can be included in program costs. Some policies might require additional funding to ensure local-level implementation. For example, state appropriations are necessary to support school health programs at the local level. State agencies need to consider these costs in addition to specific state program costs. CDC recommends that states allocate sufficient funds to support a school health council and school health coordinator and to implement a school health program in all school districts.

Priority 5. Establish a Technical-Assistance and Resource Plan that Will Provide Local School Districts with the Help They Need to Effectively Implement School Health Guidelines.

To advance state policies and support the local implementation of priority school health policies and programs that are consistent with the school health guidelines, state agencies can develop and implement a plan for providing technical assistance and resources to school districts and schools. State education and health agencies must develop the capacity to help schools improve their school health programs and provide school personnel with the tools they need to help reduce tobacco use, increase physical activity, and support healthy eating patterns among students. State health and education agency leaders can

- Establish criteria to help local schools develop, assess, and select effective curricula; institute

processes for identifying and reviewing potential programs based on these established criteria; and develop strategies for disseminating information about selected programs to teachers and community members.

- Develop and disseminate guidelines and resources to assist school districts in establishing school health councils.
- Identify and promote the use of resources for developing school health policy and for planning and assessing school health programs (e.g., CDC's *School Health Index*; NASBE's *Fit, Healthy, and Ready to Learn*; and USDA's *Changing the Scene*) and make these resources available to local school districts. For example, in Georgia, the DeKalb County Board of Education and Board of Health have collaborated to promote the use of the *School Health Index* in DeKalb's elementary schools. In the 2001-2002 school year, 17 schools completed the index, including the action plans, and 8 schools received funding from a variety of Board of Health programs. Funded activities include the following:
    - Hiring certified physical education teachers for the first time.
    - Developing walking clubs.
    - Establishing wellness programs for school staff members.
    - Purchasing exercise equipment for students to use.
    - Developing fitness stations on the school campus for use by students, staff members, and the community.
    - Providing professional development for teachers.
    - Offering healthier choices in the school vending machines.
- Identify community-resource personnel and programs that complement school health policies and make these available to local school districts to foster community-school partnerships.

Resources

- *Moving into the Future: National Standards for Physical Education*. National Association for Sports and Physical Education. Washington, DC: NASPE, 1995. Available at www.aahperd.org/naspe/publications-nationalstandards.html.
- *National Health Education Standards: Achieving Health Literacy.* Joint Committee on National Health Education Standards. Atlanta: American Cancer Society, 1995. Available at www.aahperlth_education_ standards.htm.
- *Keys to Excellence: Standards of Practice for Nutrition Integrity.* American School Food Service Association. Alexandria, VA: ASFSA, 1995. Available at www.asfsa.org. (Search "Keys to Excellence.")
- *Scope and Standards for Professional School Nursing Practice.* National Association of School Nurses, Inc. and American Nurses Association. American Nurses Publishing. Washington, DC, 2001. Available at www.nasn.org and at www/ana.org.

Resources

- *State of Maine Guidelines for Coordinating School Health Programs.* Maine Department of Education. Available at www.mainecshp.com.

- Identify national standards and guidelines for health education, physical education, school nutrition programs, and school health services and convey this information to local school districts to facilitate effective policy and program implementation.
- Establish technical-assistance communication networks (e.g., e-mail networks) or refer school health staff to existing national technical-assistance communication networks. For example, the Maine Department of Education, through its

Maine's Learning Results, has developed a technical-assistance plan to strengthen state and local efforts to improve student learning, define professional development needs, update local curricula and instructional practices, and assess student achievement. It also provided additional resources to improve school health programs through its publications, communications networks, and technical assistance.

- Identify a contact or lead person in every school to receive regular school health communications and resources.
- Identify appropriate media campaign materials and resources that can help local health agencies and school districts promote positive health messages and programs for youth.

Resources

- CDC's *Youth Media Campaign*. Available at www.verbnow.com.

- Respond to requests for technical assistance and information from local school health staff or strengthen regional technical-assistance systems to support local needs.
- Communicate school health-related findings from the *Community Guide to Preventive Services*, which features systematic reviews of published studies conducted by the Task Force on Community Preventive Services in coordination with a broad team of experts, including those from CDC. In one such review, the Task Force found that physical education classes are effective in improving both physical activity levels and physical fitness among school-age children. On the basis of these findings, the Task Force issued a strong recommendation to implement programs that increase the amount of time that students spend in school-based physical education classes.

Resources

- *Community Guide to Preventive Services*. Available at www.thecommunityguide.org.

State health and education agencies can establish frameworks for allocating funds to support local school health policies and programs that are consistent with the intent of state policies and appropriations. For example, in response to legislation that appropriated health protection funds to the Massachusetts Department of Education, the agency developed specific assurance documents that established school health councils and coordinators in the districts that received these funds. The education agency also provided technical assistance to help local coordinators implement a comprehensive, interdisciplinary Pre-K–12 health education and human services program.

Resources

- *Health Protection Fund*. Massachusetts Department of Education. Available at www.doe.mass.edu. (Search "Health Protection Fund.")

Funding Estimate: Funding for this priority provides materials and tools necessary to accomplish program priorities. Depending on the program, costs can vary. CDC recommends that approximately $120,000 per year be allocated to support personnel, technical-assistance delivery, and resource development to implement school health guidelines.

Priority 6. Implement Health Communications Strategies to Inform Decision Makers and the Public About the Role of School Health Programs in Promoting Health and Academic Success Among Young People.

State agencies need to build support at both the state and local levels for school-based programs to reduce tobacco use, increase physical activity, and improve eating behaviors among students. As an important part of this effort, state health and education agencies can develop and implement a school health communications plan to promote the value of school health programs among legislative leaders, state government policy makers (including health and education leaders), local school leaders, business leaders, parents, students, and other community members. Such a plan should foster communication among state-level partners working to improve

school health programs and increase the flow of information and resources between the state and local levels.

Resources

- *Building Business Support for School Health Programs.* National Association of State Boards of Education, 1999. Available at www.nasbe.org/Educational_Issues/Safe_Healthy.html.
- *School Health Starter Kit: For Motivated People Who Want to Get Others Involved.* Washington, DC: Council of Chief State School Officers, 1999. Available at www.publications.ccsso.org.

For example, the Oregon Department of Education formed an external communications work group to develop and implement an awareness campaign to promote coordinated school health programs among local decision makers and gatekeepers (e.g., school board members, school administrators, county commissioners). The campaign has stressed the links between students' educational outcomes and their physical, social, and emotional health and the critical role that school health programs can play in improving these outcomes. This work group includes representatives from a wide variety of state partners interested in school health, including the Oregon Association for Health, Physical Education, Recreation and Dance; the Oregon School Health Education Coalition; the Oregon Dairy Council; the Oregon Partnership (alcohol-use prevention); the Northwest affiliate of the American Cancer Society; the Oregon School Nurses Association; and Children First for Oregon (a Kids Count affiliate). As a result of the work group's efforts, in many districts, school health councils have been formed to plan the implementation of school health programs.

Funding Estimate: State communications planning and implementation costs vary greatly, depending on personnel costs and the communications activities planned each year. CDC recommends that approximately $25,000 per year be allocated to support communications personnel and the implementation of a school health communications plan.

Priority 7. Develop a Professional Development Plan for School Officials and Others Responsible for Establishing Coordinated School Health Programs and Implementing CDC's School Health Guidelines.

Professional development is critical to the effective implementation of the school health guidelines and coordinated school health programs.[13] Any state plan for reducing the risk for chronic disease among young people should include a comprehensive plan for teaching the skills that state and local decision makers, school staff, parents, and community members will need to support and implement a coordinated school health program. This development plan should address the specific training needs of the various target groups and should be informed by literature from the field of professional development and training. States can provide or support professional development training in a variety of ways:

- Through a cadre of trainers who can provide and model interactive professional development and who are themselves provided with ongoing support, training, and feedback.
- Through multiple delivery systems, such as scheduled workshops, materials centers, interactive Web sites, and district mentoring programs.
- By providing funds for professional-development events and materials.
- By providing support staff to manage the logistics of training.
- Through marketing strategies to create awareness of and encourage participation in professional development and training.

Resources

- *Strategies for Professional Development in Cooperative Agreements with State Education Agencies, Local Education Agencies, and National Non-Governmental Organizations.* Available at www.cdc.gov/nccdphp/dash.
- Assumptions about staff development based on research and best practice. Wood FH, Thompson SR. *Journal of Staff Development* 1993;14(4):52-57.

Plans should specify the target audience for each professional-development event and should include learning and performance objectives. Insofar as possible, participants in these events should develop action plans that describe how they will incorporate their newly acquired knowledge and skills into their professional responsibilities. Professional-development events should be evaluated by the quality of those plans and how well they are implemented.

Professional-development events may be needed for school personnel, such as health and physical education teachers, nurses, school counselors, food service directors, and administrators. Others who require professional development may include school board members; parents; health educators in state health departments; health department staff who work with youth-focused, community-based organizations; parks and recreation staff; business leaders; clergy; and social services and juvenile justice staff. Depending upon the work plan and desired outcomes, professional development could include awareness sessions, skill-building training, topical events, or customized offerings for teachers and school health coordinators.

Opportunities for professional development to support school health programs are available through a variety of venues, including national and state-level conferences and other continuing education opportunities offered by professional organizations.

National health organizations also offer specialized opportunities for professional development, such as those offered at the American Cancer Society's School Health Coordinator Leadership Institute. Several states have replicated the institute or are planning to do so. For more information, contact

Resources

- *Training Tracker: A Computer-Based Training Tool.* (E-mail request for information to nccddashtracker@cdc.gov.)

Education Resources

- *American School Food Service Association* (ASFSA): www.asfsa.org
- *Association for Supervision and Curriculum Development (ASCD):* www.ascd.org
- *American Association for Health Education (AAHE):* www.aahperd.org/aahe
- *National Association for Sport and Physical Education (NASPE):* www.aahperd.org/naspe
- *American School Counselor Association (ASCA):* www.schoolcounselor.org
- *National Association of School Nurses (NASN):* www.nasn.org
- *National Association of School Psychologists (NASP):* www.nasponline.org
- Society of State Directors of Health, Physical Education and Recreation (SSDHPER): www.thesociety.org

Public Health Resources

- American Public Health Association (APHA): www.apha.org
- Association of State and Territorial Chronic Disease Program Directors (ASTCDPD): www.chronicdisease.org
- Association of State and Territorial Directors of Health Promotion and Public Health Education (ASTDHPPHE): www.astdhpphe.org
- Society of Public Health Educators (SOPHE): www.sophe.org

Federal Resources

- U.S. Department of Agriculture (USDA): www.usda.gov
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC): www.cdc.gov/tobacco
- The President's Council on Physical Fitness and Sports:: www.fitness.gov

the American Cancer Society, Children and Youth Initiatives, at 404-982-3672.

Other venues for professional development include professional-preparation programs offered by institutions of higher education, professional journals, online courses, and listservs. States should develop systems to provide follow-up support to participants after the professional-development events have concluded. Such support could be provided through booster sessions, peer counseling, networking groups, or ongoing sequential training. CDC has developed *Training Tracker*, a database program that enables agencies and organizations to track their various training and professional-development activities over time. *Training Tracker* will store data useful for planning and evaluating professional development events.

State health and education agencies should support policies and identify funding that will advance the development of a statewide, comprehensive professional-development plan. In general, state agencies should designate staff to both develop this plan and ensure its implementation at the state and school-district level. However, if professional-development events are typically delivered at the regional level, it might be more appropriate for regional, county, or local education agency staff to develop their own plans.

Funding Estimate: Professional development costs can vary greatly depending on length of events, content, and participant costs. CDC recommends that states allocate approximately $120,000 of their annual budget for professional development.

Priority 8. Establish a System for Evaluating and Continuously Improving State and Local School Health Programs.

Program evaluation is an essential ongoing organizational practice in public health and education. The results of such evaluations not only measure a program's success in meeting its goals but also provide information for planning future program activities. Agencies need to develop clear plans, inclusive partnerships, and feedback systems that foster learning and ongoing improvement. Routine, practical evaluations that provide information for management and improve program effectiveness should be a part of education and public health programs at both the state and local levels.

Program evaluation helps program officials to better understand their programs' needs and assets, to establish priorities, and to use their resources more effectively.

As an agency develops its program goals, objectives, and implementation plans, it should also develop procedures for measuring its success in meeting these goals and objectives. Evaluations can be used to assess the following four aspects of program activities:

1. The development and implementation of health-related education policies.
2. The provision of professional development activities for decision makers and education and public health agency staff.
3. The development and implementation of effective curricula and programs for students.
4. The establishment of sufficient capacity to develop and implement program activities and collaborate with other organizations.

Agencies can perform two kinds of evaluations: *process evaluations* and *outcome evaluations. Process evaluations* require accurate and organized records of program activities and are central to the ability of program staff to effectively monitor and report on their activities. By delineating the *who, what, when,* and *where* of program activities, process evaluations allow agency staff to assess whether these activities met their goals and objectives. Agency staff can also use process evaluations to chart and report on activities across time in a very systematic and cost-effective manner. Because a basic understanding of the process of program activities is critical to evaluating their outcomes, education and public health agencies should conduct process evaluations annually. *Outcome evaluations* are used to assess the impact of program activities on their participants, including

Resources

- Framework for program evaluation in public health. *MMWR* 1999;48(RR-11). Available at www.cdc.gov/eval/framework.htm.
- Evaluating a national program of school-based HIV prevention. Collins J, Rugg D, Kann L, Pateman B, Banspach S, Kolbe L. *Evaluation and Program Planning* 1996;19(3): 209–18.
- *Introduction to Program Evaluation for Comprehensive Tobacco Control Programs.* MacDonald G, Starr G, Schooley M, Yee SL, Klimowski K, Turner K. Atlanta: CDC, 2001.
- *Handbook for Evaluating HIV Education.* Atlanta: CDC, 1992. Available at www.cdc.gov/nccdphp/dash/publications/index.htm.
- *Coordinated School Health Program Infrastructure Development Process Evaluation Manual.* Atlanta: CDC, 1997. Available at www.cdc.gov/nccdphp/dash/publications/index.htm.
- *Physical Activity Evaluation Handbook.* Atlanta: CDC, 2002. Available at www.cdc.gov/nccdphp/dnpa/physical/handbook/index.htm.

changes in their knowledge, attitudes, skills, and behaviors both immediately following program activities and over the long term.

Objectives measured by process evaluations may be defined by the four key concepts and eight priority actions described in this chapter and by performance measures identified by CDC program announcements. Objectives measured by outcome evaluations also may be defined by performance measures identified in CDC program announcements as well as by *Healthy People 2010* objectives.

National data can help place program data in a more useful context for understanding program outcomes. For example, the School Health Policies and Programs Study (SHPPS)[16] may help administrators understand the outcomes of policies, professional-development activities, and curricula implementation. Similarly, national Youth Risk Behavior Survey (YRBS) data may help education and public health agencies understand long-term trends in student health-risk behaviors. Although process evaluations are generally easier to conduct, agencies should conduct outcome evaluations for at least one major program activity annually. They should also conduct an overall program outcome evaluation at the end of a program's 5-year funding cycle.

Evaluation results are only valuable when they are used to develop and improve program activities. Evaluation results may be communicated to national, state, and local education and public health agencies; to school districts and individual schools; to community-based organizations; and to community members.

State agencies should develop evaluation resources, tools, and a technical assistance process to help local agencies evaluate their program activities. Agencies may want to consider enlisting the help of post-secondary institutions or of independent evaluators or evaluation firms. However, the respective roles and duties of agency staff and hired evaluators must be clearly outlined, and evaluators and agency staff must agree on the purpose, methods, and procedures of evaluations.

There are four commonly accepted standards for evaluation: *utility, feasibility, propriety,* and *accuracy. Utility* refers to the usefulness of evaluation results. Evaluations with good utility specify the amount and type of information collected, make clear the values used in interpreting collected data, and present findings in a clear and timely way. *Feasibility* refers to the extent that evaluations employ practical, non-disruptive procedures, take into account the differing political interests of those involved, and use resources prudently. *Propriety* is a measure of how well the rights of those affected by the evaluation are respected. Evaluations with good propriety have protocols and other agreements to ensure that the welfare of human subjects is protected, that the findings are disclosed in a complete and balanced

fashion that reflects multiple perspectives, and that conflicts of interest are addressed in an open and fair manner. *Accuracy* is a measure of how well evaluation results reflect reality. Accurate evaluations describe the program activities and their contexts, articulate the purpose and methods of the evaluation, employ systematic procedures to gather valid and reliable information, apply appropriate methods of analysis and synthesis, and produce impartial reports containing justified conclusions.

One example of an evaluation performed by a state education agency is the Kentucky Department of Education's assessment of training on an HIV prevention curriculum that was provided to 113 school teachers. For this evaluation, the teachers answered questions immediately before, immediately after, and 6 months after their training about their comfort in discussing or teaching topics related to HIV and pregnancy prevention, their comfort with various instructional methods, and their attitudes toward people with HIV. Evaluation results indicated that teachers' comfort with teaching HIV and pregnancy prevention topics, their comfort with instructional methods, and their attitudes about people with HIV significantly improved immediately after their training. The evaluators recommended that current training practices should be continued but that additional evaluation should be performed to determine the fidelity with which teachers implemented programs in the classroom.

Funding Estimate: States need to build their capacity to evaluate school health policies and programs and provide technical assistance in evaluation to local school districts. CDC recommends that states allocate approximately $24,000 to support evaluation efforts.

National Leadership

Leadership in these efforts can come from various sources, including federal agencies and partnerships among governmental and nongovernmental organizations at both the national and state levels.

Since 1987, the Division of Adolescent and School Health (DASH) within CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) has provided fiscal and technical support to state education agencies, large urban school districts, and national nongovernmental organizations to improve school health programs and the health of young people. DASH has also developed numerous tools and resources to assist organizations, agencies, and schools in achieving many of the priorities identified in this chapter. (These tools and resources are available at www.cdc.gov/nccdphp/dash/publications/index.html.) In addition, DASH sponsors the National School Health Leadership Conference every 2 years to promote promising practices in school health and to build national and state partnerships to improve school health policies and programs.

DASH continues to work closely with NCCDPHP's Office on Smoking and Health and its divisions of Adult and Community Health, Cancer Prevention and Control, Diabetes Translation, Nutrition and Physical Activity, Oral Health, and Reproductive Health to achieve national health objectives for preventing risks that contribute to chronic disease.

Collaborative strategies are necessary to promote healthy communities, healthy schools, and healthy children within our nation. In recognition of the need for sustained and coordinated federal efforts to strengthen and improve the education and health of school-age children and youth, the U.S. Departments of Education, Health and Human Services, and Agriculture established the Interagency Committee on School Health in 1994. The committee, which meets twice each year, is co-chaired by the Assistant Secretary for Health in the Department of Health and Human Services, the Assistant Secretary for Elementary and Secondary Education in the Department of Education, and the Under Secretary of Food, Nutrition and Consumer Affairs in the Department of Agriculture. Committee members represent the Department of Defense, the Department of Justice, the Environmental Protection Agency, the Indian Health Service, the Bureau of Indian Affairs, and the Consumer Product Safety Commission, as well as the Departments of Education, Agriculture, and Health and Human Services.

National Partnerships

The National Coordinating Committee on School Health (NCCSH) was established in 1994 by the Secretaries of the Departments of Education and Health and Human Services. Shortly after NCCSH was created, the Department of Agriculture added its support. The NCCSH was formed to link federal departments with national nongovernmental organizations to support quality, coordinated school health programs in our nation's schools. Its responsibilities include providing national leadership for the promotion of quality school health programs; improving communications, collaboration, and information sharing among national organizations; identifying local, state, and federal barriers to the development and implementation of effective school health programs; and collecting and disseminating information that can help to improve the effectiveness of these programs. Membership has grown to approximately 75 national organizations.

DASH has established formal partnerships with more than 40 national nongovernmental health and education organizations, which work with DASH to develop model policies, guidelines, and professional development opportunities to help states establish high-quality school health programs. In addition, the Association of State and Territorial Chronic Disease Program Directors (ASTCDPD), the Association of State and Territorial Directors of Health Promotion and Public Health Education (ASTDHPPHE), and the Society of State Directors of Health, Physical Education, and Recreation (SSDHPER) have established the Coordinated School Health Program Collaborative to help reduce chronic disease risks and promote healthy behaviors among students. ASTCDPD and ASTDHPPHE also collaborated on the development of the School Business Resource Kit, which provides convenient access to valuable resources for learning more about coordinated school health programs, effective strategies for implementing them at the state and local levels, and ways to strengthen partnerships between health and education agencies.

Many national education groups have worked together to gain and sustain support for implementing school health programs. These groups have developed several tools to help build support for a coordinated approach to school health. One such tool, the School Health Starter Kit, developed by the Association of State and Territorial Health Officials and the Council of Chief State School Officers, is a powerful package of research-based materials specifically designed to help communities build support for school health programs.

State Partnerships

Funding for Coordinated School Health Programs

DASH supports coordinated school health programs to discourage unhealthy behaviors such as poor eating habits, physical inactivity, and tobacco use and to promote healthy behaviors. These programs aim to reduce young people's risk for chronic disease later in life. The eight components of a school health program systematically address these risk behaviors. DASH's funding and support enable state departments of education and health to work together efficiently, respond to changing health priorities, and effectively use limited resources to meet a wide range of health needs among the state's school-age population. With this support, state and local departments of education and health are able to 1) provide high-level staff members to coordinate, support, and evaluate local school health programs; 2) build a training and development system for health and education professionals at the state and local levels; and 3) bring together various organizations to develop and coordinate strategies for reducing risk behaviors among young people.

Professional Development Consortium

DASH also supports the national Professional Development Consortium, which helps DASH-funded state and local education agencies and national nongovernmental organizations strengthen their ability to implement professional-development activities that will improve the quality of comprehensive school health education and coordinated school health programs, including HIV prevention

education. One example of such a professional-development opportunity is the National Professional Development Workshop on School-Based Tobacco Prevention and Control, sponsored by DASH, CDC's Office on Smoking and Health, and the Professional Development Consortium. Three of these national workshops, attended by teams of representatives from the education and health agencies in 32 states, have been held to improve the capacity of states to implement effective school-based tobacco-use prevention and control programs and to develop strategies for ensuring and reporting progress.

Progress to Date and Challenges Ahead

In 1987, CDC established the Division of Adolescent and School Health to help the nation's schools implement coordinated school health programs. Through this division, CDC

- Monitors the prevalence of health risks among students and the prevalence of school policies and programs to reduce those risks.
- Applies research to identify effective policies and programs.
- Evaluates the effectiveness of implemented policies and programs.
- Provides funds for state and large city departments of education and health to help schools in their jurisdictions implement coordinated school health programs.
- Provides funds for national education and health and national nongovernmental organizations, including the National Association of State Boards of Education and the National School Boards Association, to help the nation's schools implement such programs.

Because every child needs sound preparation for a healthy future, school health programs should be established in all U.S. schools. Convincing children and adolescents to adopt behaviors that reduce their risk for chronic diseases is a continual challenge and should be a goal of all public health programs. Achieving this goal requires that state leaders in public health and education accept the opportunity and responsibility to effectively implement and improve school health programs. CDC maintains its commitment to work with these state leaders and with national organizations to make coordinated school health programs available in every state.

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