The *Public Health Action Plan to Prevent Heart Disease and Stroke:* Ten-Year Update

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FOR HEART DISEASE & STROKE PREVENTION

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For more information, visit www.nationalforum.org

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Preface

Why the *Action Plan*?

The transition to the new millennium witnessed several significant developments for heart disease and stroke prevention in the United States, among them:

- For the first time, the US Centers for Disease Control and Prevention awarded funds appropriated by Congress to support prevention efforts in states with the highest cardiovascular disease death rates (1998).
- The National Association of Chronic Disease Directors established the Cardiovascular Health Council to coordinate state-level heart disease and stroke prevention work (1998).
- *Healthy People 2010* identified heart disease and stroke prevention as a distinct focus area, with its comprehensive goal "to improve cardiovascular health and quality of life through the prevention, detection, treatment, and control of risk factors; early identification and treatment of heart attacks and strokes; and prevention of recurrent cardiovascular events" (2000).
- The American Heart Association developed a formal partnership with the US Department of Health and Human Services and its *Healthy People* structure to collaborate in the new national efforts in this area (2000).

In parallel with these developments, CDC recognized the need for a long-range strategic plan "to chart a course for CDC and collaborating public health agencies, with all interested parties and the public at large, to help in promoting achievement of national goals for preventing heart disease and stroke over the next two decades – through 2020 and beyond".

Development of the 2003 *Action Plan*

For this purpose CDC, with the American Heart Association and the Association of State and Territorial Health Officials as co-lead partners, launched a planning effort in 2001. A working group and five widely representative expert panels developed a draft plan. In 2002, an ad hoc meeting called the National Forum for Heart Disease and Stroke Prevention was convened to review the draft recommendations of the plan. More than 80 people representing 66 national and international organizations and agencies participated in the Forum and the work culminated in the *Public Health Action Plan to Prevent Heart Disease and Stroke*, released by Department of Health and Human Services Secretary Tommy G. Thompson on April 15, 2003.[1]

1 For more information, visit www.cdc.gov/dhdsp/library/action_plan/index.htm

The Action Framework that guided development of the *Action Plan* was founded on the four components of the *Healthy People 2010* goal – from prevention of risk factors to prevention of recurrent cardiovascular events – and led to 24 recommendations and 69 proposed action steps. Three overarching tasks were to:

- Strike a new balance in our investment in health by putting prevention first;
- Transform our public health agencies into effective instruments for leading policy and environmental change and for supporting the entire range of public health approaches to heart disease and stroke prevention; and
- Prevent the causes themselves of heart disease and stroke when possible, upstream, not only waiting to treat the causes or their consequences, downstream.

The National Forum was formally organized in 2003 to institutionalize leadership in implementation of the *Action Plan*. The vision of the National Forum is to work together for a heart-healthy and stroke-free world and its mission is to provide leadership and encourage collaboration among organizations committed to heart disease and stroke prevention. Its ongoing task has been to prioritize the actions its member organizations can most successfully lead, convening its members annually to review progress.

The 2008 Update

The *Action Plan* calls for periodic evaluation, which first took place in 2008. That Update noted accomplishments, continuing challenges, and future directions in light of intervening changes in the landscape of heart disease and stroke prevention.[2] It highlighted landmark events of the preceding five years, the current burden of and disparities attributable to CVD, and the ongoing work of the National Forum's implementation groups. Each group identified new and continuing actions and set priorities for the immediate future.

The rationale for public health action to prevent heart disease and stroke was "strongly reinforced by current data and by the interim developments", and it was concluded that the *Action Plan* "continues to chart a course whose pursuit during the remainder of this decade and through the next is vital to the present and future health of this nation and the world" (National Forum, 2008b).

The 2008 Update remains faithful to the underlying premises and key recommendations of the original *Action Plan*, while taking into account developments of the past decade that present new opportunities and continuing challenges for improvement in the nation's health and movement toward our vision of a world that is heart-healthy and stroke-free.

In four of the following Sections, we update each Section of the original *Action Plan*: the need for action, platform for action, call to action, and mobilization for action. We conclude with a focus on next steps for bringing implementation to scale, in 2014 and beyond.

2 For more information, visit http://nationalforum.org/actionplan

Executive Summary

The *Public Health Action Plan to Prevent Heart Disease and Stroke* was released in April 2003 by Tommy G. Thompson, Secretary of Health and Human Services, who saw the *Action Plan* as being "…our landmark, long-term guide for improving the nation's heart and stroke health" and offering "…a new promise of success. Quite simply, this plan gives health practitioners and policy makers a framework for developing a health care system that equally supports treatment and prevention."

Influence of the *Action Plan*: A Decade of Progress and Change

Since its initial release, the *Action Plan* has been influential in shaping efforts to prevent heart disease and stroke in the United States and beyond, serving as the foundation for:

- Creating the National Forum for Heart Disease and Stroke Prevention (2003);
- Providing the mission and goals for CDC's new Division for Heart Disease and Stroke Prevention (2006);
- Preserving the Heart Disease and Stroke Focus Area and strengthening objectives for this topic area in *Healthy People 2020* (2010);
- Launching the Million Hearts® Initiative as a partnership between CDC and the Center for Medicare and Medicaid, leveraging prevention and public health provisions of the Affordable Care Act (2011);
- Forming the CDC Million Hearts Collaboration, which links CDC with leading national organizations to help achieve the goals of both the Million Hearts Initiative and the *Action Plan* (2012); and
- Collaborating with colleagues around the world in their efforts to reduce the global burden of heart disease and stroke (2003 – 2013).

More generally, the *Action Plan* is a continuing point of reference for the State Heart Disease and Stroke Prevention programs and the ongoing work of CDC's Division for Heart Disease and Stroke Prevention.

A New Perspective

Today, a decade after its release, we have updated the *Action Plan* in accordance with its four original pillars: the need for action, the platform for action, the call to action, and mobilization for action.

1. Need for Action

The continuing *need for action* reflects these facts:

- Declining death rates from heart disease and stroke in the United States over the past decade indicate significant ongoing progress towards becoming a nation that is heart healthy and stroke free.
- Continuing CVD morbidity results from still-high incidence of heart attacks and strokes and a shift to a less-often fatal and a more-often disabling course of major CVD.
- Persisting health disparities resulting from CVD reflect unequal exposure to the causes and unequal access to prevention and treatment for minority and other vulnerable populations.
- Rising costs of CVD in the United States have been forecast to exceed $1 trillion annually by 2030.
- Increasing global costs of CVD result from rising rates of ischemic heart disease and stroke, which rank first and second among causes of death, first and third among causes of years of life lost, and first and fourth among causes of disability-adjusted years of life lost, worldwide.

2. Platform for Action

The most prominent new planks in the *platform for action* are:

- New understanding of the lifetime impact of low CVD risk, early life origins of CVD, decline in cardiovascular health from childhood, and the potential for positive health interventions.
- New policies and programs, such as the prevention and public health provisions of the Affordable Care Act, the Million Hearts Initiative, the *Healthy People 2020* goals and objectives, and the American Heart Association/American Stroke Association's 2020 Impact Goal.
- New tools for communication and information exchange through social media, the National Forum's Policy Depot, CDC's messaging programs; healthcare quality improvement through mHealth; population health monitoring/surveillance through electronic health records; and other innovations.
- New partnerships in government, the private sector, and with potential new partners in agriculture and food policy, urban planning and environmental quality, health care systems planning and evaluation, and others.

3. Call to Action

Sharpened priorities in the *call to action* include:

- Seven Action Priorities for 2014 and beyond, based on the fundamental requirements and essential components of the 2003 *Action Plan* and new circumstances and opportunities
- Strategies for dissemination, and implementation of the Ten-Year Update

4. Mobilization for Action

Mobilization for action focuses on the community level:

- The rationale for community level prevention
- Guidance to prevention at the community level
- Recent community-level initiatives

Based on this perspective, the *Action Plan*: Ten-Year Update identifies seven action priorities that reflect the changing landscape – both new opportunities and remaining barriers.

Seven Immediate Action Priorities for 2014 and Beyond

Priority	Focus	Action Needed
Effective communication	Prevention and public health	Communicate to legislators, policymakers, and the public at large the nation's vital stake in sustaining and building upon the prevention and public health provisions in the Affordable Care Act, e.g., the National Prevention Council, Prevention and Public Health Fund, and others.
Strategic leadership, partnerships, and organization	Public health – healthcare collaboration and integration	Integrate public health and health care into a public health system effective in supporting community-level prevention policies and programs, e.g., the Million Hearts Initiative.
Taking action	Cardiovascular health and health equity	Develop, advocate, and implement policies, programs, and practices aimed to improve the nation's cardiovascular health in terms of the *Healthy People 2020* objectives and AHA metrics – addressing tobacco use, overweight/obesity, physical activity, healthy diet (including reduction in sodium and artificial trans fat intake), blood pressure, cholesterol, and fasting plasma glucose); and ensure that all such actions reach everyone, especially those most vulnerable due to unfavorable social and environmental conditions.
Building capacity	Prevention workforce	Make full use of resources for education and training of the prevention workforce at local, state, national, and global levels.
Evaluating impact	Monitoring cardiovascular health	Advocate for a comprehensive, robust and timely system of monitoring cardiovascular events (heart attacks, stroke, heart failure) and cardiovascular health metrics for the US population, including full adoption of the "developmental" heart disease and stroke objectives of *Healthy People 2020*.
Advancing policy	Research on critical questions to advance policy and practice	Pursue needed implementation and dissemination science and health economics research, including needed education and training for this research, in support of health policy development, implementation, and dissemination.
Engaging in regional and global collaboration	Initiatives linking CVD and NCD prevention	Undertake collaborations in major regional and global cardiovascular health and NCD initiatives, in the interest of improving cardiovascular health and reducing the burden of NCDs in the United States and globally.

(Source: Authors)

The Outlook for the Future

Although the high burden, unacceptable disparities, and ever-mounting costs of CVD throughout the nation and the world persist, they are largely preventable. Since the launch of the original *Action Plan*, the opportunities to reduce CVD incidence and risk have become significantly clearer, and specific actions have been identified to exploit these opportunities. Sound policies and programs to improve cardiovascular health are in place and known to be effective. Significant progress has been made over the past decade.

Now these policies must be disseminated and programs scaled up to realize their full potential impact, especially by investing "upstream". Fortunately, support for these efforts has been expanded significantly through financial, regulatory, and legal provisions for prevention and public health under the Affordable Care Act and by increased attention, engagement, and investment by private organizations and foundations. These recent developments add greatly to the momentum behind public health efforts to prevent heart disease and stroke and other major non-communicable diseases.

Putting the *Action Plan*: Ten-Year Update to work will require new and sustained commitments by interested organizations, agencies, and individuals, with the expected reward of an unprecedented impact on the nation's health. There is abundant opportunity for meaningful action at every level: individual, community, state, national, and global. Sustaining the commitment of organizations and individuals at each of these levels offers high promise for progress, from the present reality to a future that is heart-healthy and stroke-free.

1: Mounting Need for Action

The first pillar of the 2003 *Public Health Action Plan to Prevent Heart Disease and Stroke* is the demonstrated need for action to reduce the burden, disparities, and costs of heart disease and stroke to the nation, based on the great potential for prevention. This Update presents data that clearly reaffirm this need and the opportunity.

1.1: Burden and Disparities – United States

The cardiovascular disease (CVD) burden and accompanying disparities in the United States today are illustrated here with selected data regarding changes since the late 1990s as documented in the *Healthy People 2010* Final Report and American Heart Association's (AHA) Heart Disease and Stroke Statistics – 2013 Update (HHS, 2010; Go et al., 2013).[1]

The *Healthy People 2010* Final Report indicates the progress, or lack of progress, on each of the objectives for the past decade for which data were available for evaluation (HHS, 2010). A total of 19 objectives (including sub-objectives for specific target groups) were included in the heart disease and stroke Focus Area in *Healthy People 2010*.[2] The data presented in Table 1.1 indicate general improvement in these indicators for the United States population as a whole. Death rates for coronary heart disease (CHD) and for stroke far exceeded the targets, each with decreases of one-third from the baseline rates in 1999 to 2007, the latest final mortality data available for this report. Hospitalization for heart failure also declined by one-third over this period for the youngest stratum (ages 64-75 years). In striking contrast, hypertension increased in prevalence by 20%, while the target called for a nearly 40% decrease.

The *Heart Disease and Stroke Statistics 2013 Update* presents the current situation as indicated by available data during report preparation in 2012 (Go et al., 2013). Deaths in 2009 from new or recurrent CHD and strokes and from heart failure totaled more than 570,000, resulting from more than 1.7 million events. Living with CHD, stroke, heart failure, or hypertension (with some overlap among these categories) were 15.4 million, 6.8 million, 5.1 million, and 77.9 million persons, respectively. Ideal cardiovascular health behaviors – defined by AHA as the most favorable scores on four components, tobacco use, body mass index (BMI), physical activity, and healthy diet – were virtually absent in the population. However, ideal cardiovascular health factors – similarly defined with four components, tobacco use, blood pressure, cholesterol, and fasting plasma glucose – were present in 35.5% of the population aged 12-19 years, and 13.9% of those aged 20 years and older (Lloyd-Jones et al., 2010).

1 For further data, see the Appendix Tables 1-6
2 Tracking data for all objectives can be found at: http://wonder.cdc.gov/data/2010

Table 1.1: Selected Indicators of CVD Burden, United States (HHS, 2010; Go et al., 2013)

From the *Healthy People 2010* Final Report

1	The majority of objectives for which data were available showed improvement, with movement toward (8), or meeting or exceeding (4) targets.
2	The CHD death rate decreased by 35.4% from 1999 to 2007, from 195/100,000 to 126/100,000, surpassing the target of 165/100,000.
3	The stroke death rate decreased by 32.3% from 1999 to 2007, from 62/100,000 to 42/100,000, surpassing the target of 50/100,000.
4	Hospitalizations for congestive heart failure among persons aged 65-74 years decreased by 35.6%, from 1999 to 2007, from 13.2/1000 to 8.5/1000, surpassing the target of 6.5/1000; for older persons hospitalization rates decreased but did not reach their respective targets
5	Prevalence of hypertension among persons aged 18 years and older increased by 20% from 1988-1994 to 2005-2008, from 25% to 30%, moving away from the target of 14%

From *Heart Disease and Stroke Statistics 2013 Update*

6	Numbers of events: New and recurrent CHD, 915,000 (2013 estimate), 386,324 deaths 2009; new and recurrent stroke, 795,000 (annual estimate), 128,842 deaths 2009; heart failure, 56,410 deaths 2009.
7	Prevalence of CHD, 2010: 15.4 million; stroke, 6.8 million; heart failure, 5.1 million; hypertension, 77.9 million.
8	Ideal health profile, composite score e6, 2007-2008: age 12-19 years, 8.2%; ages e 20 years, 3.6%.
9	Ideal health behaviors, composite - all 4, 2007-2008: age 12-19 years, 0.0%; ages e 20 years, 0.1%.
10	Ideal health factors, composite - all 4, 2007-2008: age 12-19 years, 35.5%; ages e 20 years, 13.9%.

(Source: Authors)

These observations suggest three conclusions regarding the current burden of CVD in the United States. First, improvement is possible and has in fact been dramatic as measured by mortality rates for CHD and stroke through the past decade. Second, prevalence of these major cardiovascular conditions remains high, with tens of millions of people affected, even before including high blood pressure (which by far dominates the total count). Third, ideal levels of the underlying behaviors and resulting factors, when viewed in terms of cardiovascular health and despite longstanding recognition and significant expenditures to improve them, remain elusive for the great majority of the population. Especially significant, they decline in prevalence from pre-adult to adult ages, indicating a loss of cardiovascular health from childhood.

Reduction or elimination of health disparities has long been an integral part of *Healthy People* as an over-arching goal and is addressed specifically in the context of heart disease and stroke as well, in the 2010 Final Report (HHS, 2010). Regarding change over the decade in measures for the 2010 objectives, large geographic disparities continue to be observed in occurrence of death from CHD and stroke. Disparities by race/ethnicity and education attainment persist – often with 50% or greater excesses among the least versus the most advantaged groups – and have in many instances widened even while overall improvements have taken place. African Americans and persons with less than high school education are particularly disadvantaged in these respects.

Table 1.2: Disparities in Selected Health Indicators by Race/Ethnicity, United States (HHS, 2003)

From the *Healthy People 2010* Final Report

1	Disparities by geographic location continue, with CHD especially concentrated in the "coronary valley" (the Ohio-Mississippi River Basin) and stroke in the "stroke belt" (Southeast).
2	Disparities by race/ethnicity, sex, and educational attainment were prominent and widespread across the 2010 objectives, with many having increased and few improved over the decade.
3	These disparities commonly were excesses of 50% or more for the least favorable versus the most favorable group.
4	Reductions in death rates for both CHD and stroke affected groups differentially, with persistent or increasing disparities between the least favorable versus the most favorable groups.
5	High and increasing disparities were especially frequent among African Americans (CHD deaths, stroke deaths, hypertension prevalence) and persons with less than high school education (CHD deaths, stroke deaths, and knowing their blood pressure).

From *Heart Disease and Stroke Statistics 2013 Update*

6	Prevalence of CHD, and of both stroke and heart failure, in 2005-2008 were especially high among black females, and among both black males and females, respectively.
7	Among health behaviors, prevalence of smoking in 2011 was greater among black and white males and females compared with Mexican Americans; among males, physical activity in 2011 was least among Mexican Americans; and overweight and obesity in 2010 were greatest among Mexican American males and both black and Mexican American females.
8	Among health factors, in 2010, prevalence of high blood pressure was greatest, in 2010, for black males and females; total cholesterol (>200 mg/dl) was greater for Mexican American than black or white males; physician-diagnosed diabetes mellitus was most frequent among black males and females.
9	At no age, from 12-19 to e60 years of age, in 2007-2008, was the ideal cardiovascular health score of 7 attained by any percentage of the population; the most lenient standard, meeting a composite ideal cardiovascular health score e5, was observed in 39.8% at age 12-19 and 15.8% among all persons aged e20 years, a marked disparity by age; among adults, whites had higher prevalence of ideal cardiovascular health (by 5 or more of 7 metrics) that did blacks or Mexican Americans.
10	The least often-met ideal cardiovascular health component in 2007-2008 was dietary pattern, at every age. Variation in dietary patterns by race/ethnicity among adults was marked - and mixed - in 2005-2008: white men and women reported diets furthest from dietary guidelines in sugar-sweetened beverages; non-Hispanic black men and women reported diets lowest in meeting whole grains and in nuts, legumes, and seeds; and Mexican American men and women reported patterns with intakes of whole grains, nuts, legumes and seeds, also of sweets and bakery desserts, saturated and total fats as a percentage of calories all closest to meeting dietary guidelines.

(Source: Authors)

The American Heart Association's 2013 Statistical Update presents a summary of recent indicators of cardiovascular health disparities by race/ethnicity (Go et al., 2013). The excess burden of CHD, stroke, and heart failure among blacks is demonstrated as of 2005-2008. Adverse health behaviors and factors affected black men and women especially, although some measures were also disadvantageous for Mexican American males or females. No group exhibited ideal cardiovascular health under its most stringent definition, but a more lenient criterion (at least 5 of 7 metrics classified as ideal) revealed prevalence greater among white than among black or Mexican American adults and greater among persons under age 20 than at ages 20 years and older. Healthy diet score is problematic in that the ideal level is vanishingly rare in the population. Scores on most components are predominantly intermediate or poor, with some variation among race/ethnic groups.

General conclusions regarding these disparities are: First, geographic disparities, as indicators of variation in cardiovascular health over large areas of the country, remain prominent and only dimply understood. Second, disparities by race/ethnicity persist, are in some instances widening, and continue to be especially disadvantageous for blacks. Third, disparities by age have long been recognized in terms of cardiovascular event rates, but are now evident as well in terms of loss of cardiovascular health, beginning before adulthood, as ideal health behaviors and factors decline into and throughout adulthood.

More generally, the continuing burden of CVD calls for intensification of our prevention efforts from public health and health care, or community and clinical, perspectives. The cumulative success of preventive efforts from both public health and clinical domains has resulted in a significant decrease in CHD deaths and continuing fall in stroke deaths over recent decades (Rosamond, 1998; Pearson, 2013). These major declines are considered about equally attributable to population-wide risk factor trends and treatment of individuals with risk factors or CVD (Ford, 2007). However, partially offsetting increases in obesity and diabetes are a very serious concern. One-third of adults and up to 18% of youth are obese, while one in three Americans are expected to develop type 2 diabetes by the year 2050 (Hill, 2013). Currently, 8.3% of the US population lives with diabetes and an additional 35% have prediabetes, at high risk for the development of diabetes. (Hill, 2013). Adding heart failure and chronic kidney disease (CKD) to the aggregate burden, and continued aging of the population, presage substantial increases in costs of CVD to the United States in the near future.[3]

Disparities in CVD occurrence in the United States begin with the wide geographic variations, noted above, not explainable in terms of clinical care access, race/ethnicity, education, or other plausible factors. The Centers for Disease Control and Prevention's county-level atlases of CHD and stroke mortality in the United States show persistence of the long-recognized stroke belt and demonstrate the "coronary valley" as well (Casper, 2000; Barnett, 2001; Casper 2003). Disparities by race and ethnicity are also striking. For example, non-Hispanic blacks have been found to have CHD rates in marked excess over those of other racial and ethnic groups. Indeed, CVD is the greatest cause of lower life expectancy for this group. This is demonstrated forcefully in the work of Murray and colleagues, whose "eight Americas" exhibit a 12- to 15-year deficit in life expectancy for non-Hispanic black men and women in comparison with Asian Americans, the longest-lived of the eight demographic strata in the United States. Death rates for persons with less than a high school education were almost three times the rates of those with some college education. (Murray, 2006; Frieden, 2011; NCHS, 2012)

With increased survival from acute coronary syndromes, longer lives, and improved clinical and community care, the prevalence of heart failure is believed to be steadily increasing, although there are difficulties with measurement (Bonneux, 1994). On the basis of data from National Health and Nutrition Examination Survey (NHANES) 2007–2010, approximately 5.1 million Americans 20 years of age and older had heart failure. Projections also suggest that by 2030, the prevalence of heart failure will increase another 25% from 2013 estimates. The total cost of heart failure is projected to increase from an estimated $32 billion in 2012 to $70 billion in 2030, a 120% increase (Go, 2013).

3 See Section 1.2

Chronic kidney disease appears to be another factor for all-cause mortality and CVD in the general population and is more pronounced in blacks than in whites. While some controversy exists about whether CKD is an independent risk factor for CVD, it is clear that people with CKD, as well as those with end-stage renal disease (ESRD) are at very high risk for CVD events (Go, 2013). For individuals with CKD, CVD mortality rates are 10 to 30 times higher than in the general population (Go, 2013; US Renal Data System, 2002). Some 20 million adults in the United States have CKD and 8 million of these are classified as having moderate or severe kidney disease (Levey, 2003; Weiner, 2004).

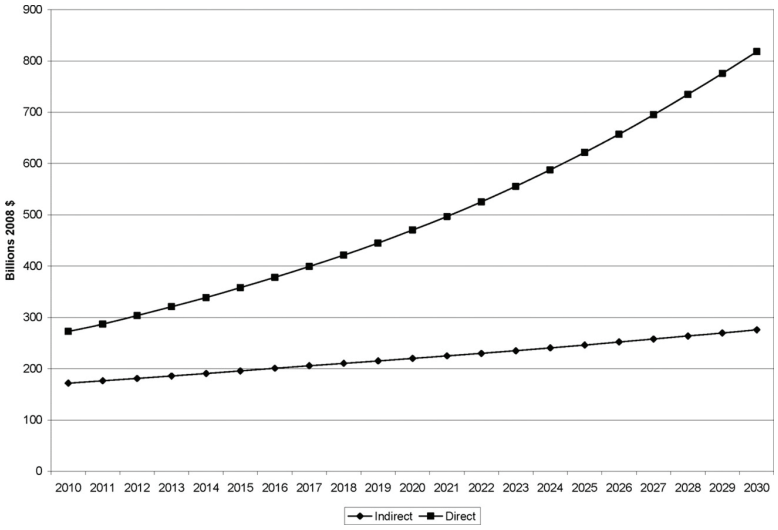
Between the 1988–1994 NHANES study and the 2003–2006 NHANES study, the prevalence of CKD jumped from 18.8 to 24.5% in people ages 60 and older. Between 1980 and 2009, the prevalence rate for ESRD increased nearly six-fold, from 290 to 1,738 cases. In 2009, more than 871,000 people were being treated for ESRD in the United States (NIDDK, 2013).

Overall, reductions in heart disease and stroke deaths, mainly favorable risk factor trends (reductions in smoking, second-hand smoke exposure, and uncontrolled high blood pressure and cholesterol), and increasing use of effective treatments are encouraging. Yet the challenges of increasing prevalence of obesity and diabetes and persistent disparities in cardiovascular health underscore the need for more effective and sustained action to continue favorable change and arrest the adverse changes underlying these conditions.

1.2: Projected Costs – United States

Despite advances in prevention and treatment and a steady decline in mortality rates, heart disease and stroke remain the number one and four killers of Americans respectively and continue to exact a heavy toll in terms of morbidity, mortality, disparities, and health care costs. The share of overall medical costs attributable to CVD is 17% and projected to grow. The American Heart Association recently developed a peer-reviewed methodology to forecast the prevalence and future costs of care for hypertension, CHD, heart failure, stroke, and all other CVDs through 2030 (Heidenreich, 2011).

Figure 1.1: Projected Direct and Indirect Costs of All CVD, 2010 to 2030, US (in billions 2008$) (Heidenreich, 2011)



(Source: *Circulation*)

Total direct medical costs associated with CVD were projected to triple, from $273 billion in 2010 to $818 billion in 2030. Indirect costs due to lost productivity from all CVDs were similarly projected to increase from $172 billion to $276 billion in 2030, an increase of more than 60%. Combined, these costs were projected to exceed $1 trillion by 2030 (Heidenreich, 2011).

In 2013, analogous forecasts addressed specifically two of the conditions included in the original estimates: heart failure and stroke (Heidenreich, 2013; Ovbiagele, 2013). Between 2013 and 2030, both heart failure and stroke were projected to increase by about 20%, due largely to the aging of the population. By 2030 it was estimated 3.9% of the US population over the age of 18 could expect to have a stroke and that between 2012 and 2030, total annual direct stroke-related medical costs were projected to increase from $71.55 billion to $183.13 billion (2012$). Indirect costs (again, attributable to lost productivity) were similarly projected to rise from $33.65 billion to $56.54 billion over the same period, raising total annual costs of stroke to $240.67 billion by 2030, an increase of 129%.

In modeling the heart failure projections, the original forecasting methods were further adapted to address issues associated with double counting comorbid conditions. Under this model it was estimated that by 2030 over 8 million people in the United States would have heart failure, or one in every 33 persons. Total direct medical costs attributable to heart failure were projected to increase from $21 billion to $53 billion; total annualized costs, inclusive of indirect costs, were estimated to grow from $31 billion in 2012 to $70 billion in 2030. The investigators further noted that, with inclusion of the total costs of all cardiac care for heart failure patients, the 2030 projected cost estimates of treating patients with heart failure would have exceeded $160 billion in direct costs.

Through ongoing work in this critical area, AHA continues to update its projections. The revised total direct medical costs of CVDs are now projected to more than double, from $415 billion to $918 billion (2012$) between 2013 and 2030. Indirect costs (due to lost productivity) are estimated to increase from $189 billion to $290 billion in 2030, an increase of 53%. The combined costs attributable to CVDs are now forecasted to exceed $1.1 trillion by 2030; the annual CVD costs for persons age 65 to 79 are projected to increase by 144%, from $215 billion in 2012 to $524 billion per year in 2030.

The projections serve as a sobering reminder of what is in store for the United States if insufficient policy changes are made and action taken to reverse these trends. Effective prevention strategies, such as those outlined in the 2003 Action Plan and this Update, are essential if we are to curtail these trends.

1.3: Global Perspective

Four statements reflect a current global perspective on heart disease and stroke:

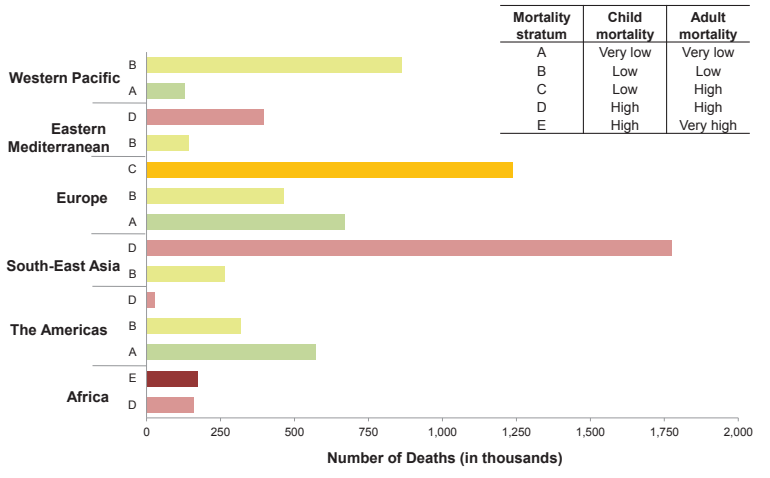
- They affect people everywhere, throughout their entire life course, and have done so for several decades.
- They are caused by factors that are well known, occur universally, and are modifiable through effective – and cost-effective – interventions at both population and individual levels.

- They have been projected to increase in their burden worldwide, especially in low- and middle-income countries, by measures of death, disability, disparities, and costs.
- They predominate in the global burden of non-communicable diseases (NCDs) and share in their major contributing causes – prevention of heart disease and stroke has far-reaching impact on other NCDs as well.

The global burden of heart disease and stroke was documented more than 30 years ago when World Bank data showed that death rates for both ischemic heart disease and cerebrovascular disease were substantial in every region of the world as estimated for 1985, regardless of the strong continuing dominance in some regions of other causes of death as a proportion of the total (Bulatao, 1992). More recently, the World Health Organization (WHO) presented estimates of deaths due to ischemic heart disease and stroke, by WHO region and mortality stratum, showing again that no region is free of the burden of these diseases (WHO, 2004). These numbers of deaths from ischemic heart disease are dominated by India in the region of South-East Asia, the Russian Federation in Europe, and China in the Western Pacific. For stroke, the leaders are China, India, and the Russian Federation. Even in Africa, notably, more than 200,000 deaths from each cause were estimated to have occurred in 2002.

Global disparities in CVD deaths and disability, with underlying social and economic conditions, were mapped for nearly 200 countries in 2004 (Mackay, 2004). Recently, the Global Burden of Disease Study 2010 reported that ischemic heart disease and stroke together caused one in four deaths worldwide in 2010, increased from one in five in 1990 – 12.9 million deaths in all (Lozano, 2012). Looking ahead to 2020, heart disease and stroke are projected to rank the first and second causes of death globally, first and third causes of years of life lost, and first and fourth causes of disability-adjusted life years lost However, these are not the only forecasts of the future – rival aspirations are expressed by leading organizations and reflect confidence that meaningful action can be taken, with substantial positive impact (Labarthe, 2012).

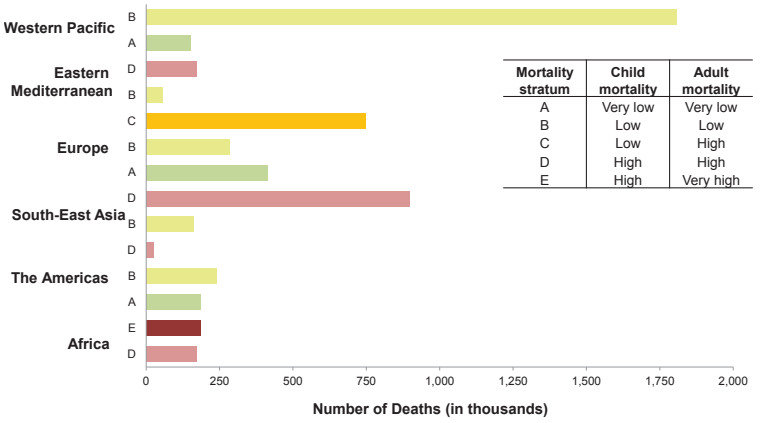
Figure 1.2: Global Ischemic Heart Disease Death Rates (WHO, 2004)



Number of deaths (in thousands) due to ischemic heart disease by mortality strata in each WHO region, 2002.

(Source: WHO)

Figure 1.3: Global Stroke Deaths (WHO, 2004)



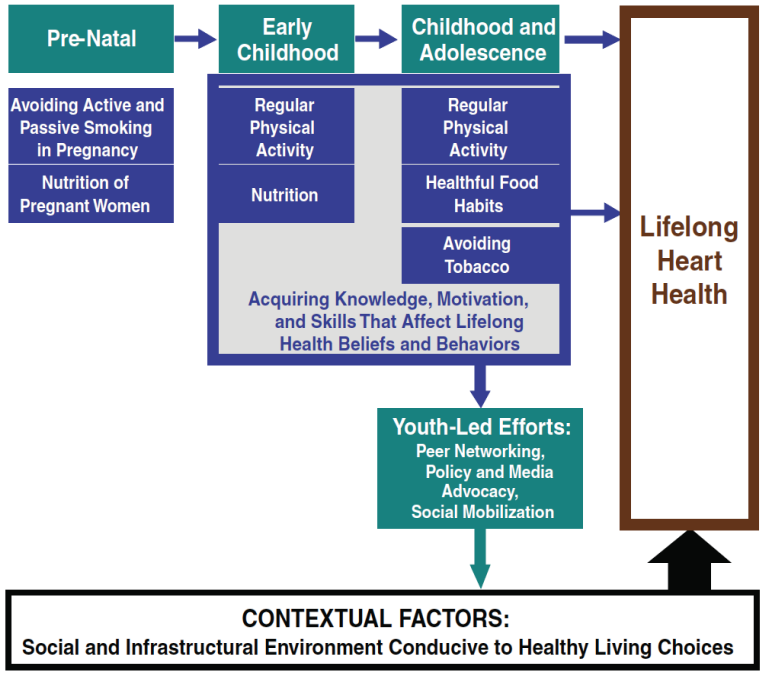
Mortality stratum	Child mortality	Adult mortality
A	Very low	Very low
B	Low	Low
C	Low	High
D	High	High
E	High	Very high

Number of deaths (in thousands) due to cerebrovascular disease by mortality strata in each WHO region, 2002.

(Source: WHO)

Development of cardiovascular risk begins in childhood or in utero and progresses throughout life for the majority of people (IOM, 2010). Figure 1.4 underscores the growing recognition that fetal, neonatal, and early childhood conditions have lasting effect on cardiovascular risk. Evidence of pre-natal influences extends the concept of primordial prevention, or prevention of CVD risk factors in the first place, backward in development from childhood to fetal life, or to prior parental behaviors and health status as well as the social and environmental conditions of early life. This understanding is important to the concept of promotion and preservation of cardiovascular health beginning in childhood.

Figure 1.4: Growing Toward Heart Health: Influences and Opportunities into Adulthood (IOM, 2010)



(Source: IOM)

Consistent with estimates from the Global Burden of Disease Study, the INTERHEART and INTERSTROKE studies convincingly demonstrate the ubiquity of a limited number of factors – fewer than 10 – that account for some 90% of the occurrence of ischemic heart disease and cerebrovascular disease in every region of the world (Mathers, 2006; Yusuf, 2004; O'Donnell, 2010). The IMPACT CHD model attributes declines in CHD deaths in several countries to both favorable population-wide trends in these factors and widespread (if far from complete) implementation of effective treatments for individuals with existing disease (Ford, 2007). Several of these factors have been shown to be modifiable through cost-effective interventions, denoted recently by the WHO as "Best Buys", at either the population or the individual, health care level (WHO, 2011).

Table 1.3: WHO's "Best Buys" in NCD Prevention: Population- and Individual-Level Interventions with Known Cost-Effectiveness (WHO, 2011)

The population level	Protecting people from tobacco smoke and banning smoking in public places
	Warning about the dangers of tobacco use
	Enforcing bans on tobacco advertising, promotion and sponsorship
	Raising taxes on tobacco
	Restricting access to retailed alcohol
	Enforcing bans on alcohol advertising
	Raising taxes on alcohol
	Reducing salt intake and salt content of food
	Replacing trans-fat in food with polyunsaturated fat
	Promoting public awareness about diet and physical activity, including through mass media
The individual, health-care level	Counseling and multidrug therapy ("a regimen of aspirin, statin, and blood pressure-lowering agents...in people at high cardiovascular risk"), including glycemic control for diabetes for people ≥ 30 years old with a 10-year risk of fatal or nonfatal cardiovascular events ≥ 30%
	Aspirin therapy for acute myocardial infarction

(Source: Authors)

Among several global CVD forecasts, one of the more forceful is the 2004 report, A Race Against Time: The Challenge of Cardiovascular Disease in Developing Countries (Leeder, 2004). The potential impact of these conditions on the working-age population (35-64 years) of developing countries was illustrated with projections of loss of life and productivity for Brazil, China, India, Russia, and South Africa. It was concluded that "…without concerted, ongoing intervention to prevent the precursors and reverse the negative effects of CVD in developing countries, a global health crisis in the current workforces (and later among the elderly) of those countries will occur – and sooner, rather than later".

By 2011, discussing the major NCDs together (CVD, cancer, diabetes, and chronic respiratory diseases), WHO expressed a similarly alarming assessment: "…[T]he epidemic of these diseases is being driven by powerful forces now touching every region of the world: demographic ageing, rapid unplanned urbanization, and the globalization of unhealthy lifestyles. While many chronic conditions develop slowly, changes in lifestyles and behaviours are occurring with a stunning speed and sweep" (WHO, 2011).

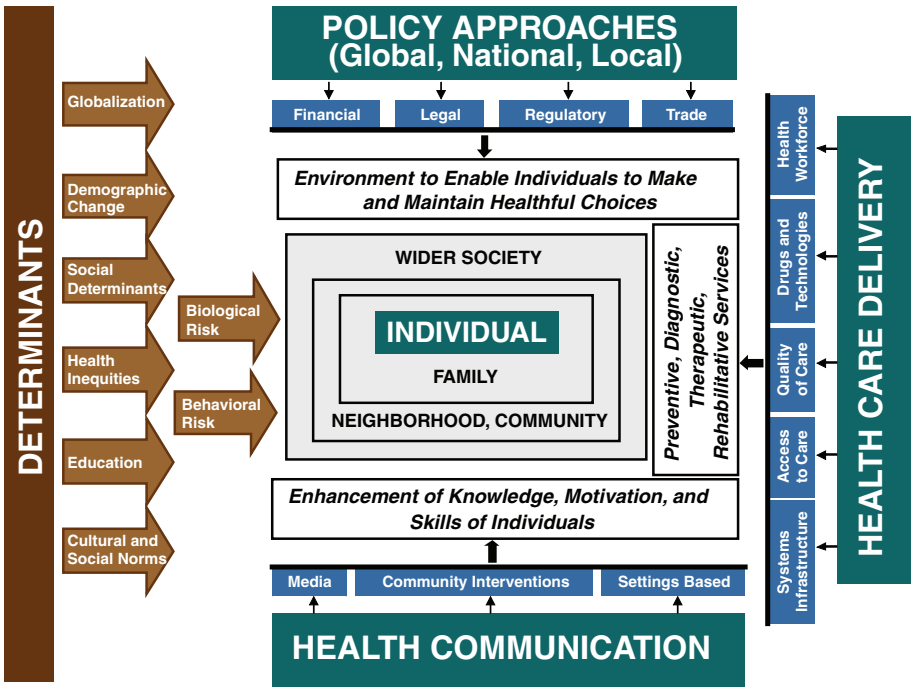
But against these ominous predictions, WHO in the same report offered the prospect that action based on the "Best Buys" noted above could potentially "…[p]roduce accelerated

results in terms of lives saved, diseases prevented, and heavy costs avoided". This suggestion of a rival forecast, more optimistic regarding potential impact if effective action is taken, is reinforced by a number of reports and recommendations over the past decade.

Global Developments of the Past Decade

A focus on CVD in developing countries was reflected in a 1988 poster from WHO reading: "Heart attacks are developing in developing countries – Prevent them now". Reference by WHO, quoted above, to the "stunning sweep" of change in the world's most populous and least developed countries reinforces the urgency of CVD prevention especially in such countries. The 2010 IOM report, *Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health*, presents an extensive analysis of the problem and proposes a comprehensive framework for action that embraces the major determinants and strategies of health communication, health care delivery, and policy approaches to meet the challenge (IOM, 2010; 1998). Figure 1.5 represents the interplay between health determinants and health care, and the contributions of health communication and health policy, to the health status of individuals, families, neighborhoods, communities, and wider society. It is a useful general backdrop for the Action Framework of the *Action Plan,* with its focus on cardiovascular health and disease.

Figure 1.5: Comprehensive Strategy to Address CVD (IOM, 1998)



(Source: IOM)

A prominent aspect of recent reports – and the evolving conceptualization of global health priorities – is the focus not on CVD alone, but on the major NCDs together: CVD, cancer, diabetes, and chronic respiratory diseases (IOM, 2010; Labarthe, 2012). A mounting wave of concern regarding neglect of NCDs followed from omission, in the United Nations' Millennium Development Goals, of any reference to CVD or the NCDs. Health goals discussed were limited to HIV/AIDS, malaria, and tuberculosis (UNGA, 2000).

The consequences of this concern with broadest practical significance were developments leading to the High-level Meeting of the UN General Assembly (UNGA) to address the global challenges of NCDs in September 2011, and subsequent work by WHO to fulfill the resulting charge from the UNGA (UNGA, 2011). The Secretary-General of WHO was directed to present options for action by the end of 2012, report on progress made by 2013, and undergo a comprehensive review and assessment of progress in 2014.

Accordingly, WHO developed the Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013-2020 (WHO, 2013). The Global Action Plan calls for a 25% relative reduction in premature mortality from the NCDs by 2025. Voluntary global targets are set for each major determinant: alcohol use, physical activity, population intake of salt/sodium, tobacco use, blood pressure, diabetes and obesity, drug therapy and counseling to prevent heart attacks and strokes, and essential medicines. This represents a considerable advance over preceding recommendations, being expressed in terms of explicit quantitative and, in principle, measurable indicators of intervention impact. This new level of specificity, prioritization, and focus, with standardized intervention targets, presents a new context for regional and global collaboration. This may create opportunities for the United States' effective engagement in these activities through the

Table 1.4: Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013-2020 (WHO, 2013)

Vision: A world free of the avoidable burden of noncommunicable diseases.		
Goal: To reduce the preventable and avoidable burden of morbidity, mortality and disability due to noncommunicable diseases by means of multisectoral collaboration and cooperation at national, levels, so that populations reach the highest attainable standards of health and productivity at every age and those regional and global diseases are no longer a barrier to well-being or socioeconomic development.		
Overarching principles:	• Life-course approach	• Human rights approach
	• Empowerment of people and communities	• Equity-based approach
	• Evidence-based strategies	• National action and international cooperation and solidarity
	• Universal health coverage	• Multisectoral action
	• Management of real, perceived or potential conflicts of interest	
Objectives		
1. To raise the priority accorded to the prevention and control of noncommunicable diseases in global, regional and national agendas and internationally agreed development goals, through strengthened international cooperation and advocacy.		
2. To strengthen national capacity, leadership, governance, multisectoral action and partnerships to accelerate country response for the prevention and control of noncommunicable diseases.		
3. To reduce modifiable risk factors for noncommunicable diseases and underlying social determinants through creation of health-promoting environments.		
4. To strengthen and orient health systems to address the prevention and control of noncommunicable diseases and the underlying social determinants through people-centred primary health care and universal health coverage.		
5. To promote and support national capacity for high-quality research and development for the prevention and control of noncommunicable diseases.		
6. To monitor the trends and determinants of noncommunicable diseases and evaluate progress in their prevention and control.		
Voluntary global targets		
(1) A 25% relative reduction in the overall mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases		
(2) At least 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context		
(3) A 10% relative reduction in prevalence of insufficient physical activity		
(4) A 30% relative reduction in mean population intake of salt/sodium		
(5) A 30% relative reduction in prevalence of current tobacco use in persons aged 15+ years		
(6) A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances		
(7) Halt the rise in diabetes and obesity		
(8) At least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes		
(9) An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major noncommunicable diseases in both public and private facilities		

(Source: WHO)

Action Plan and National Forum, as well as with organizations working at the global level. Accompanying these global targets is a "comprehensive global monitoring framework" with 25 indicators classified as measures of morbidity and mortality, behavioral and biological risk factors, and national systems responses. Several dietary indicators are included, consistent with WHO's Global Strategy on Diet, Physical Activity and Health, that emphasize intakes of sodium, saturated and trans-fatty acids, fruits and vegetables, and alcohol (WHO 2004).

On a regional level, a new initiative with potential global reach is the Global Standardized Hypertension Control program of CDC. In partnership with the Pan American Health Organization (PAHO), CDC has led development of this initiative with a three-part goal: establish a simplified core set of antihypertensive medications for region-wide or global use in treating most people with hypertension; assure availability and affordability of these medications through production and distribution arrangements; and adaptation of health care systems to meet requirements of effective care delivery for long-term, sustained hypertension control. Initial implementation will be in the region of Latin America and the Caribbean (Sonia Angell, Senior Advisor, Centers for Disease Control and Prevention; Personal communication, 2013).

Regional and Global Aspects of the *Action Plan* and Role of the National Forum

From the beginning, the *Action Plan* emphasized a global perspective, recognizing regional and global collaboration as one of the five essential components of the plan. The rationale for this component lies in the mutual gain from sharing knowledge and experience in heart disease and stroke prevention throughout the world. The United States has much to offer and much to learn from such collaboration.

Engagement of the United States in global health was already strongly supported as of 2003 by the IOM's report, America's Vital Interest in Global Health, which concluded: "… [T]he United States should build on its strengths and seize the unprecedented opportunities to work with its international partners to improve health worldwide" (IOM, 1997). The next year, the IOM report, Control of Cardiovascular Diseases in Developing Countries: Research, Development, and Institutional Strengthening, recommended specific steps to assess the burden, develop intervention plans, and take effective action country by country (IOM, 1998). Further, the Department of Health and Human Services (HHS) was already supporting and conducting global health activities potentially applicable to heart disease and stroke prevention (HHS, 2003).

The National Forum's Expert Panel on Regional and Global Collaboration developed for the 2003 Action Plan a comprehensive set of recommendations, action steps, and expected outcomes that mirrored those of the other four panels for action within the United States. This underscored the close parallel of needs and opportunities between the United States and the rest of the world (HHS, 2003).

First, one of the *Action Plan's* highest priorities was to strengthen the global focus of organizations and agencies in the United States on global cardiovascular issues. Finding a lack of explicit national policy in this area, the National Forum created and adopted in 2008 a policy statement guiding action in the United States toward improving regional

and global cardiovascular health (National Forum, 2008a). The Statement is aligned with CDC global health goals, incorporates core values and guiding principles, and identifies six implementation strategies that address tobacco control, diet, physical activity, and essential drugs and lifestyle counseling for prevention and treatment of CVD, including prevention of recurrent CVD events.

Second, strengthening capacity to take action on regional and global recommendations for heart disease and stroke prevention was seen to require substantially increased resources for education and training, especially regarding policy development, implementation, and evaluation. Acting on this, and reiterated in the 2008 Update, the National Forum convened a global summit on education and training in 2009 that brought together leaders in academia, profit- and non-profit sectors, and government. The report presents a six-point rationale in support of the global need for education and training to foster action, and it outlines available approaches to meet this need (National Forum, 2009).[4]

Third, a priority also reiterated in the 2008 *Action Plan* Update is to assist in strengthening global capacity to develop, implement, and evaluate policies and programs for heart disease and stroke prevention. For this purpose the National Forum, in collaboration with the Country-wide Integrated Non-communicable Diseases Intervention (CINDI) Program and with unrestricted grant support from Bayer HealthCare, created the Policy Depot (Mason, 2012). As a model of the regional and global collaboration envisioned in the Action Plan, this initiative drew on input from more than 30 national and international organizations and agencies and explicitly aims to facilitate progress toward the global improvement in cardiovascular health called for by the UNGA 2011 resolution (UNGA, 2011).[5]

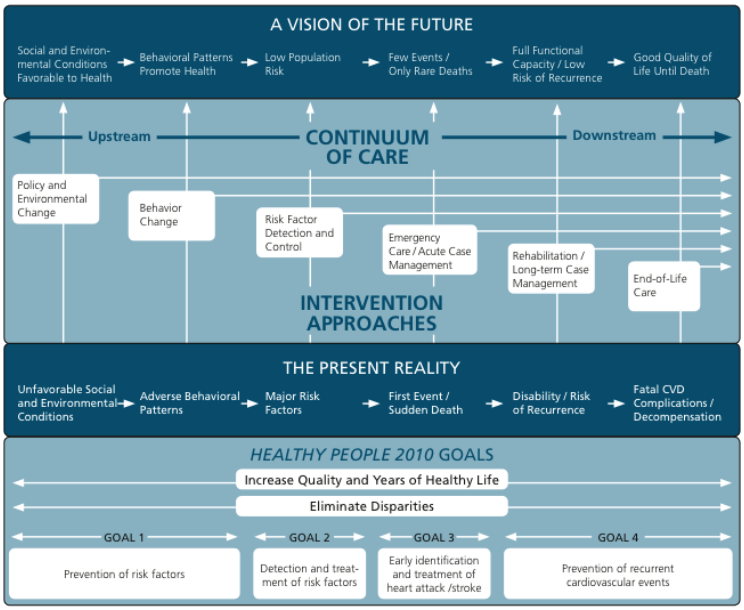
Moving beyond 2013, the *Action Plan* and the National Forum's priorities have clearly been and remain congruent with those of the global community. For example, the *Action Plan* and National Forum activities parallel several specific targets of the WHO's Global Action Plan as well as the Global Standardized Hypertension Treatment program. Continuing focus by the National Forum on overall reduction in CVD mortality, cardiovascular health disparities/health equity, sodium reduction, and surveillance provide examples of areas of continuing regional and global collaboration, as can new opportunities as they arise. There is significant potential to impact CVD and other NCDs on a global scale.

4 Recommendations from this report are discussed in section 4.2
5 The Policy Depot is discussed further in section 3.2

2: New Planks in the Platform for Action

The second pillar of the 2003 *Action Plan* was "A Comprehensive Public Health Strategy and the Five Essential Components of the Plan: A Platform for Action". The platform features a schematic Action Framework to guide long-range strategic planning and effective intervention to prevent heart disease and stroke.

Figure 2.1: Action Framework (National Forum, 2008b)



(Source: National Forum)

The framework presents a vision of the future of cardiovascular health for the United States, juxtaposed against the present reality (valid in 2014 as it was in 2003). This represents a spectrum of progressive development of risk from unfavorable social and environmental conditions to the clinical onset of major cardiovascular events, resulting in either early death or in prolonged disability and risk of recurrence to the end of life. Intervention approaches are denoted that can achieve movement from the present to that vision at every point along the spectrum: policy and environmental change, population behavior change, risk factor detection and control, emergency care and acute case management, rehabilitation and long-term case management, and end-of-life care.

The spectrum from population-wide public health interventions to individual-level treatment and case management represents a continuum of care, from population to patient. While the former, upstream, interventions are especially germane for public health strategies, the overall functioning of health systems to provide accessible, affordable, high-quality clinical services downstream is also integral to attaining goals

of population health. From the population health perspective, the public health system embraces the entire array of intervention approaches as a whole.

The *Healthy People 2010* goals for heart disease and stroke prevention were the foundation on which the framework was built. They serve in the same pivotal role in *Healthy People 2020*. They can be distinguished as prevention of risk factors (Goal 1), detection and treatment of risk factors (Goal 2), early identification and treatment of heart attacks and strokes (Goal 3), and prevention of recurrent cardiovascular events (Goal 4).

A 1988 IOM report defined the mission of public health and its three core functions. It strongly emphasized the role of public health agencies in collaboration with health care providers, other health-sector partners, non-health-sector partners, the public at large and representatives of specific groups or settings, and all interested parties and stakeholders (IOM, 1998). Two subsequent IOM reports published in 2002 addressed new requirements for educating health professionals. They proposed a broad view of the public health system, focusing on population health, strengthening public health infrastructure, building partnerships, developing systems of accountability, emphasizing evidence, and improving communication (IOM, 2002a; 2002b).

To consider contemporary public health approaches to prevent heart disease and stroke, as conceptualized in the Action Framework in 2003, five planning components were considered essential:

- **Taking action:** putting present knowledge to work;
- **Strengthening capacity:** transforming the organization and structure of public health agencies and partnerships;
- **Evaluating impact:** monitoring the disease burden, measuring progress, and communicating urgency of action;
- **Advancing policy:** defining gaps in policy and research needs to fill them; and
- **Engaging in regional and global partnerships:** multiplying resources and capitalizing on shared experience.

An expert panel was selected to address each component and provide recommendations, propose specific action steps, and define the expected outcomes. A working group was charged to integrate these contributions into a comprehensive plan. The group found two areas in which recommendations made by the panels warranted separate recognition as fundamental requirements of the plan: *effective communication*, and *strategic leadership, partnerships, and organization* of the nation's public health agencies and their partners. In all, 24 recommendations and 69 specific action steps were proposed (HHS, 2003).

Two key steps followed. First was to institutionalize the *Action Plan*, through establishment of the National Forum for Heart Disease and Stroke Prevention as a permanent entity to be its principal vehicle of implementation (Labarthe, 2008). Second was to prioritize its recommendations, resulting in selection of eight initial action targets (Labarthe, 2005).

This was the platform for action as of 2003. In the first Update (2008) the original recommendations were retained and two were added, while specific action steps were

updated and further prioritized in recognition of progress made, new opportunities, and resource considerations (National Forum, 2008b). The platform was reaffirmed.

Today, taking account of developments of the past decade, we see many new opportunities for action. These are based on new knowledge and understanding of what matters most and what works best in heart disease and stroke prevention, new policies and programs that demonstrate how much can be done, new tools that can be deployed to support public health efforts, and new partners who can help to broaden the base of action well beyond that of the health sector alone.

Review of these four areas demonstrates important new planks in the platform for action.

2.1: New Knowledge and Understanding

Low Risk and Lifetime Risk

Understanding of cardiovascular risk factors such as blood lipids, blood pressure, and blood glucose has long been focused on values at the upper extreme of risk or, since Rose, both the upper extreme and the overall distribution (Rose, 1981). Attention specifically to the low risk extreme is a development mainly of the past decade, for example: low risk in terms of the major established risk factors (blood lipids, blood pressure, blood glucose, BMI, absence of smoking), is associated not only with low rates of cardiovascular events and greater life expectancy, but also better quality of life and lower health care expenditures through the end of life (Stamler, 1999; Daviglus, 2003; Daviglus, 2005). Recent findings that midlife cardiorespiratory fitness predicts reduced risk of later-life dementia further support this concept – and potentially broaden its implications to include preservation of cognitive function, a cardiovascular condition of major public health importance in itself (DeFina, 2013). Thus low risk has become a newly prominent focus of attention.

Individual cardiovascular risk assessment has by common convention been defined as short-term, 10-year risk, with interest especially in those at the upper extreme. When risk prediction is extended to lifetime risk, as measured at various ages ranging from 45 years to 75 years, it is found that the same factors have significant prognostic value throughout the remaining years. This is true not only at the upper extreme but also for those at low risk (Berry, 2012). Preservation of low risk to middle age and to successively older ages throughout adulthood continues to confer benefit as measured by rates of fatal CHD, nonfatal myocardial infarction, and fatal or nonfatal stroke. Being and remaining at low risk are therefore explicitly worthy goals for cardiovascular health.

Cardiovascular Health – Ideal and Positive

Cardiovascular risk behaviors[1] as well as risk factors[2] have also been examined from a positive perspective, with demonstration that persons with a healthy profile of lifestyle factors (with respect to diet, physical activity, tobacco, alcohol, and BMI) experience substantially lower incidence of CHD (Stampfer, 2000).

1 Now "health behaviors"
2 Now "health factors"

These observations, resulting from a new positive orientation, have contributed importantly to the growing recognition that cardiovascular health, and not only CVD, is an appropriate focus of policy and practice. An intermediate step has been to define cardiovascular health and to specify metrics for monitoring its occurrence and change in the population over time. Table 2.1 presents for each of the seven metrics adopted by AHA data from the 2005-2006 cycle of NHANES to estimate the prevalence of "poor", "intermediate", and "ideal" status on each metric, separately among children and adults in the United States (Lloyd-Jones, 2010). Among children, ideal status predominates over intermediate or poor status for current smoking (83%), BMI (69%), total cholesterol (67%), blood pressure (82%), and fasting plasma glucose (81%). For adults this is true only for smoking status (73%). *Cardiovascular health metrics mainly decline from childhood to adulthood*.

A further observation from Table 2.1 is the virtual absence (less than 0.5%) of an ideal healthy diet score, in either children or adults. Even an intermediate score – meeting only two to three components of the score – is found in only 9% of children 5-19 years of age and 26% of adults over age 20. The score includes five primary indicators of a dietary pattern consistent with the Dietary Approaches to Stop Hypertension eating plan: minimum target intakes of fruits and vegetables, fish, fiber-rich whole grains, and maximum intakes of sodium and sugar-sweetened beverages. Secondary indicators, used in monitoring but not included in the score, are minimum target intakes of nuts, legumes, and seeds, and processed meats, and maximum intakes of saturated fat. Given the fundamental role of nutrition, change in the diet of all Americans must be high on the agenda for improving cardiovascular health (Implications of these findings are discussed in section 2.2).

Table 2.1: Definition of Poor, Intermediate, and Ideal CV Health for Each Metric, Along with NHANES 2005-2006 Unadjusted Prevalence Estimates for AHA 2020 Goals (Lloyd-Jones, 2010)

	Poor Health		Intermediate Health		Ideal Health	
Goal/Metric	Definition	Prevalence, %	Definition	Prevalence, %	Definition	Prevalence, %
Current smoking						
Adults >20 y of age	Yes	24	Former ≤12 mo	3	Never or quit >12 mo	73 (51 never; 22 former >12 mo)
Children 12–19 y of age	Tried prior 30 days	17			Never tried; never smoked whole cigarette	83
Body mass index						
Adults >20 y of age	≥30 kg/m^2	34	25–29.9 kg/m^2	33	<25 kg/m^2	33
Children 2–19 y of age	>95th Percentile	17	85th–95th Percentile	15	<85th Percentile	69
Physical activity						
Adults >20 y of age	None	32	1–149 min/wk moderate intensity or 1–74 min/wk vigorous intensity or 1–149 min/wk moderate+vigorous	24	≥150 min/wk moderate intensity or ≥75 min/wk vigorous intensity or ≥150 min/wk moderate+vigorous	45
Children 12–19 y of age	None	10	>0 and <60 min of moderate or vigorous activity every day	46	≥60 min of moderate or vigorous activity every day	44
Healthy diet score						
Adults >20 y of age	0–1 Components	76	2–3 Components	24	4–5 Components	<0.5
Children 5–19 y of age	0–1 Components	91	2–3 Components	9	4–5 Components	<0.5
Total cholesterol						
Adults >20 y of age	≥240 mg/dL	16	200–239 mg/dL or treated to goal	38 (27; 12 treated to goal)	<200 mg/dL	45
Children 6–19 y of age	≥200 mg/dL	9	170–199 mg/dL	25	<170 mg/dL	67
Blood pressure						
Adults >20 y of age	SBP ≥140 or DBP ≥90 mm Hg	17	SBP 120–139 or DBP 80–89 mm Hg or treated to goal	41 (28; 13 treated to goal)	<120/<80 mm Hg	42
Children 8–19 y of age	>95th Percentile	5	90th–95th Percentile or SBP ≥120 or DBP ≥80 mm Hg	13	<90th Percentile	82
Fasting plasma glucose						
Adults >20 y of age	≥ 126 mg/dL	8	100–125 mg/dL or treated to goal	34 (32; 3 treated to goal)	<100 mg/dL	58
Children 12–19 y of age	≥126 mg/dL	0.5*	100–125 mg/dL	18	<100 mg/dL	81

Some percentages do not appear to add up because of rounding.
SBP indicates systolic blood pressure; DBP, diastolic blood pressure.
*Estimate not reliable.

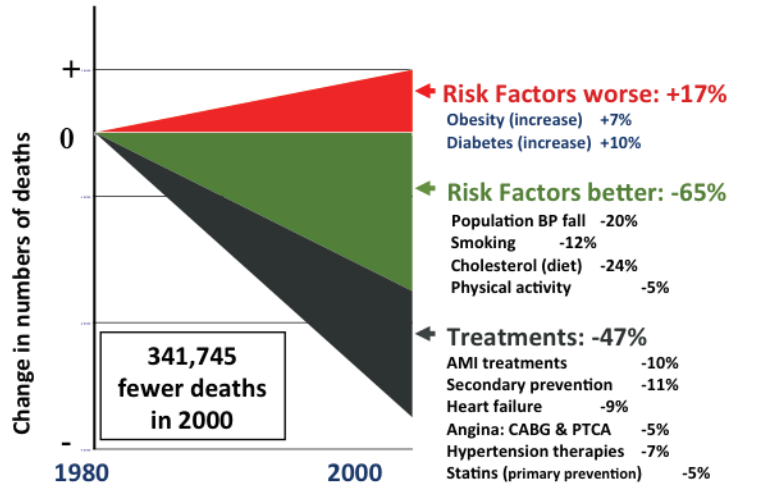
(Source: Circulation)

Converging with these advances in the concept of cardiovascular health are new insights about positive health, from the field of positive psychology (Seligman, 2008). Many observations suggest that such subjective psychological attributes as optimism and other measures of positive psychological well-being are protective against cardiovascular events, independent of major risk factors or negative emotions (Boehm, 2012a). Interventions to strengthen such positive psychological attributes have been considered promising as an approach to improving cardiovascular health, in part by improving health behaviors. (Seligman, 2005; Boehm, 2012b). Under the Pioneer Portfolio of the Robert Wood Johnson Foundation, the project "Exploring the Concept of Positive Health" is assessing such evidence for establishing a discipline of "positive cardiovascular health" to include policy and practice interventions (RWJF, 2013).

Models to Explain the Past and Predict the Future

Statistical models have become more commonly used to explain historical trends, assess contributions of multiple factors to the present burden, or forecast the future course of CVD under various assumptions of intervention impact (Unal, 2006). For example, the IMPACT CHD model has been applied looking both backward and forward to estimate effects of population-wide risk factor trends and clinical treatment of persons with known CHD, in several countries (Ford, 2007; Huffman, 2013). In the United States, coronary deaths observed in 2000 were more than 840,000 fewer than expected based on 1980 rates, the difference due about equally to population-wide improvements in blood pressure, cholesterol, smoking, and physical activity – despite partially off-setting increases in diabetes and obesity – and use of commonly available treatments of patients with CVD (Figure 2.2, based on data from Ford, 2007).

Figure 2.2: Major Shifts in Population Risks and Expanded Treatment of CHD, 1980-2000 (based Ford, 2007)



Explaining the fall in coronary heart disease deaths, IMPACT Model, United States, 1980-2000.

(Source: Capewell, S., with permission)

Models have also been used to evaluate the relative impact of particular interventions, for example, to improve quality of care and thereby reduce the number of preventable deaths (Farley, 2010). Farley and others estimated that services to prevent CVDs would have the greatest impact on all-cause mortality. Improved treatment of hypertension and

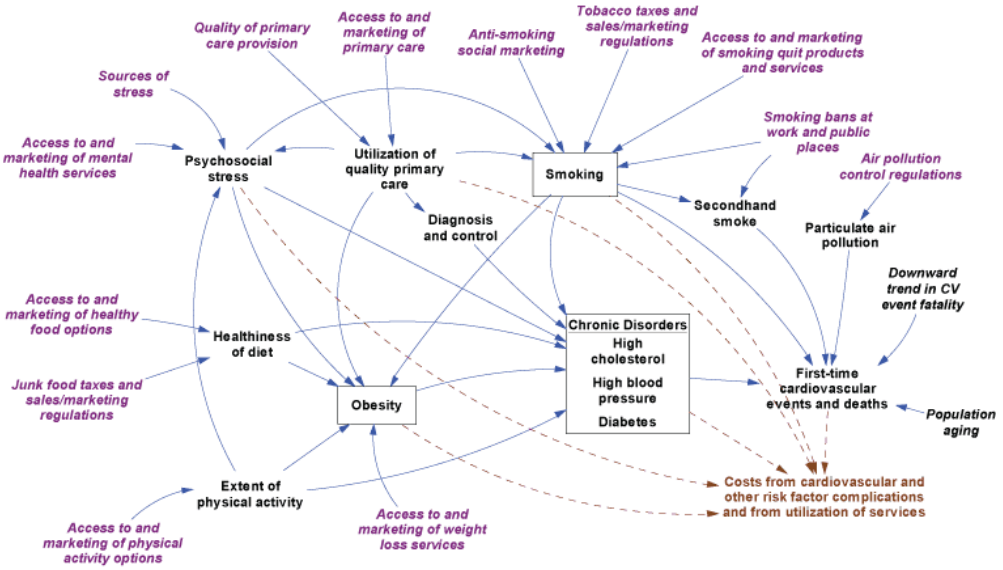
elevated LDL-cholesterol and more frequent use of aspirin prophylaxis could together prevent 50,000-100,000 deaths per year for persons aged less than 80 years, including 25,000-40,000 deaths at ages below 65 years. These findings supported the CDC policy priority of focusing on the ABCS"[3] in efforts to accelerate reduction in cardiovascular mortality. This is the rationale for the Million Hearts Initiative.

Significantly, total mortality has also been shown to be reduced by measures to improve cardiovascular health, in a model of "perfect care". Under this model, risk factors are eliminated and all effective medications are prescribed before and between acute heart disease events. According to the model, risk factor elimination prior to any event, or between initial and recurrent events, would be more effective than treatments during the acute episode. The apparent impact of this strategy on total mortality adds further weight to the view that improving cardiovascular health has important implications for NCDs more generally, and not CVD alone (Kottke, 2009).

Historical analyses reinforce the concept that both population-wide trends and clinical interventions with wide uptake have important impact in reducing CHD deaths. As another example, system dynamic modeling has been used to assess community-level determinants of cardiovascular events, supporting community leaders in decision-making regarding intervention priorities tailored to local circumstances (Homer, 2010). Figure 2.3 reveals relationships among multiple contextual factors and more proximal ones that may strongly influence the effectiveness of targeted interventions. This model also provides insight into both intervention costs and the savings from reduced costs of cardiovascular events and lost productivity.

3 Appropriate use of aspirin therapy, Blood pressure control, Cholesterol management, and Smoking cessation

Figure 2.3: Simulation Model for CVD Outcomes (Homer, 2010)



(Source: *Preventing Chronic Disease*)

Ongoing Assessment of Evidence for Prevention

Understanding the potential impact of interventions is an ongoing task, with well-established practices for evidence reviews. Several of the current standard approaches have been reviewed and illustrated recently, including those of the ACC/AHA, European Society of Cardiology, United States Preventive Services Task Force (Task Force), Cochrane Collaboration, and WHO (Labarthe, 2011). Chief among these from a public health perspective in the United States is the work of the Community Preventive Services Task Force. The charge to the Task Force, expanded under the Affordable Care Act (ACA), includes continual identification of new topic areas for review, not less often than 5-yearly updates of previous reviews, improved integration with Federal Government health objectives, enhanced dissemination of recommendations, and provision of technical assistance for implementation. A yearly Report to Congress is required, and the 2013 Report is devoted to CVD prevention (The Patient Protection and ACA, 2010; Task Force, 2013).

A comprehensive compilation of the Task Force's recommendations relevant to cardiovascular health – including, for example, those pertaining to tobacco use, nutrition, or physical activity – has yet to be published. However, those identified in the 2013 Report to Congress are only a small part of the Task Force's work in this area to date. Those listed here concern interventions in clinical settings and relate to provider and patient behaviors and cost factors: team-based care for CVD prevention, reducing out-of-pocket costs for medications to control high blood pressure and cholesterol, and for evidence-based tobacco cessation treatments; tobacco quitline interventions; and clinical decision-support systems. In each case, the Task Force has published a Task Force Finding & Rationale

Table 2.2: Recent Recommendations of the Community Preventive Services Task Force Addressing Risk Factors for CVD (Task Force, 2013)

Type of Intervention	Description of Intervention	Task Force recommends it based on effectiveness in
Team-Based Care—for CVD prevention	A health systems intervention that uses a team—including primary care providers, other health professionals (usually nurses and pharmacists), and patients—working together to improve blood pressure control among patients at risk for CVD	1) Reducing blood pressure in individuals 2) Improving blood pressure control in a larger proportion of patients
Reducing Patient Out-of-Pocket Costs—for medications to control high blood pressure and high cholesterol	Reducing patient out-of-pocket costs for medications to control high blood pressure and high cholesterol, when combined with additional policies or actions to improve patient–provider interaction and patient knowledge	1) Improving medication adherence 2) Lowering blood pressure and cholesterol
Clinical Decision-Support Systems—for CVD prevention	Computer-based information systems, specifically aimed at CVD prevention, designed to assist healthcare providers in implementing clinical guidelines at the point of care	1) Improving screening by healthcare providers for CVD risk factors 2) Improving practices for CVD-related preventive care, clinical tests, and treatments
Reducing Out-of-Pocket Costs—for evidence-based tobacco cessation treatments	Program and policy changes to make evidence-based tobacco cessation treatments—including medication, counseling, or both—more affordable	Increasing the number of tobacco users who quit, thereby reducing their risk of CVD and other tobacco-related diseases and conditions
Quitline interventions—to increase tobacco use cessation	Quitline interventions available at no cost to quitters—particularly proactive quitlines (i.e., those that offer follow-up counseling calls)—that provide evidence-based behavioral counseling and support, sometimes along with pharmacotherapy, to help tobacco users quit	Increasing tobacco use cessation among callers interested in quitting, thereby reducing their risk of CVD and other tobacco-related diseases and conditions

(Source: Task Force)

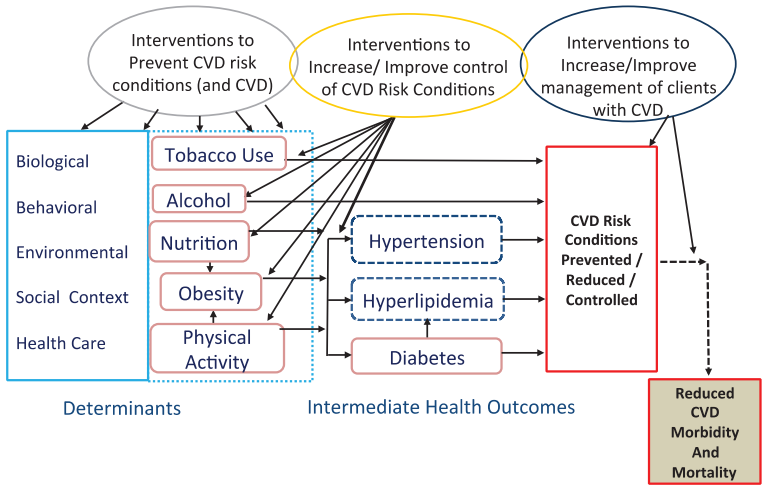
Statement that presents a definition of the topic, findings of the review, and rationale for its recommendations.[4] In addition to discussion of applicability of the findings, data quality, and other benefits and harms of the recommended action, two other significant aspects are addressed: considerations for implementation, and evidence gaps.

Findings of many other Task Force reviews relevant to cardiovascular health have been published elsewhere and are tabulated in the 2013 report.[5] These reviews relate to preventing excess alcohol consumption, diabetes prevention and control, school-based nutrition programs, obesity prevention and control, promoting physical activity, and reducing tobacco use and secondhand smoke exposure.

From discussion in the 2013 report it is anticipated that the Task Force will, in coming years, further address high blood pressure; high cholesterol; diets high in fats, cholesterol or salt; and obesity – topics on which the Task Force has conducted only limited reviews to date. Such reviews would be consistent with the charge to the Task Force under the ACA, Title IV, Sec 4003, to provide "…yearly reports to Congress and related agencies identifying gaps in research and recommending priority areas that deserve further examination, including areas related to populations and age groups not adequately addressed by current recommendations" (ACA, 2010). The CVD prevention logic model adopted by the Task Force conveys the scope of this activity, from prevention of risk through risk factor control to management of CVD.

4 Each report is available at: www.thecommnityguide.org
5 See Appendix Tables 8-10

Figure 2.4. Logic Model: Strategies to Prevent CVD, (Task Force, 2013)



(Source: Task Force)

2.2: New Policies and Programs

The Affordable Care Act and Its Implications for Cardiovascular Health: Million Hearts and More

The potential impact of the ACA on prevention and public health is beyond measure, though this aspect of the health reform law enacted in 2010 has been little recognized outside public health circles (The Patient Protection and ACA, 2010). The Affordable Care Act is described by Koh and Sebelius as responding to the high prevalence of preventable health conditions among Americans and the shortage of delivery of recommended preventive services:

> …with a *vibrant emphasis on disease prevention*. Many of the 10 major titles of the law, especially Title IV, Prevention of Chronic Diseases and Improving Public Health, advance a prevention theme through a wide array of new initiatives and funding. As a result, we believe that the Act will *reinvigorate public health* on behalf of individuals, worksites, communities, and the nation at large…and will usher in a *revitalized era for prevention at every level of society* (The Patient Protection and ACA, 2010; p1296). [Emphasis added]

Koh and Sebelius tabulate 28 provisions from five titles of the law that create new opportunities across these several levels (Koh, 2010). Among these provisions, political attention has especially targeted the Prevention and Public Health Fund, Title IV Section 4002, which "expands and sustains national investment in prevention and public health programs" and appropriates funds that were scheduled to escalate from $500 million in FY 2010 to $2 billion per year for FY 2015 and beyond. Trust for America's Health, reporting frequently on Congressional action, chronicles more than 30 attempts mounted by members of Congress to reallocate these funds to other programs, with some success.[1]

There is no sign of public awareness of these provisions or the importance of sustaining them. This is cause for concern and points to one potential action priority for the National Forum and other organizations in 2014 and beyond.

For example, it is this array of provisions that enabled creation of the Million Hearts Initiative, launched in September 2011, with its multiple lines of action for heart disease and stroke prevention (Frieden, 2011). The underlying concept is that increased focus on priority preventive services and community interventions affecting heart disease and stroke can have a major immediate impact on the rate of cardiovascular events in the United States. The primary levers are those noted above within the ACA to strengthen affordability, access, and quality of preventive services – with quantitative targets for improvement.

The goal is to prevent 1 million heart attacks and strokes in the United States between 2012 and 2017 through these improvements in the ABCS and in population-wide measures to reduce consumption of sodium and trans fats as well as tobacco use. The Million Hearts process involves engagement of both clinical and community resources and utilizes new tools such as health information technology (electronic health records), quality of care

1 For more information, visit: healthyamericans.org/health-issues/news

incentive programs (the Physician Quality Reporting System), and clinical innovations such as team care. For example, this approach has been developed for rapid implementation to improve hypertension control, as recommended by the Task Force (Task Force, 2013).

Table 2.3: Affordable Care Act's Improvement Targets for the ABCS (Frieden, 2011)

Intervention	Baseline	Target	Clinical target
Aspirin for those at high risk	47%	65%	70%
Blood pressure control	46%	65%	70%
Cholesterol management	33%	65%	70%
Smoking cessation	23%	65%	70%
Sodium reduction	~ 3.5 g/day	20% reduction	
Trans fat reduction	~ 1% of calories	50% reduction	

(Source: New England Journal of Medicine)

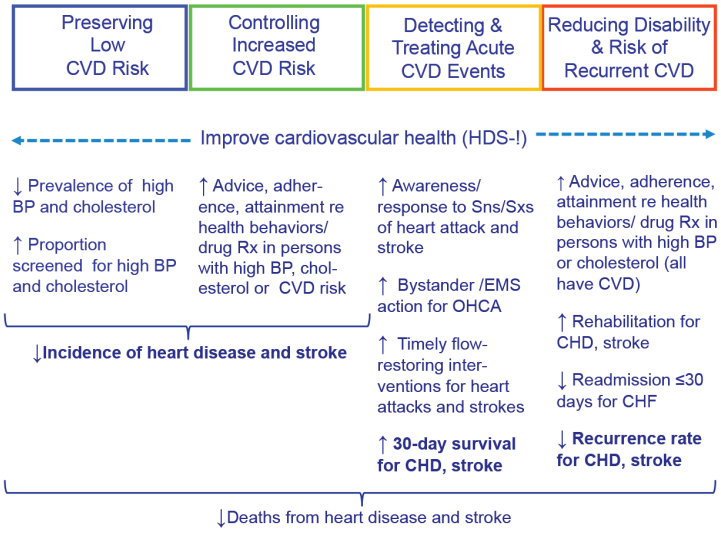
A further provision of the ACA is to support a National Diabetes Prevention Program, focusing on reducing preventable diabetes in at-risk adult populations. In this program, reimbursement is provided for the lifestyle-behavioral interventions that are its core. This is a significant advance in reimbursement/cost-reduction policies potentially applicable to other interventions (The Patient Protection and ACA, 2010).

2020 Goals for Cardiovascular Health: *Healthy People* and AHA/ASA

Healthy People 2010 expressed federal policy for heart disease and stroke prevention as of 2000, by recognizing this topic as Focus Area 12 in *Healthy People 2010* (HHS, 2000). Success in the effort to retain categorical topic areas for *Healthy People 2020* was accompanied by retention of the 2010 goal for heart disease and stroke, to "improve cardiovascular health and quality of life through the prevention, detection, and treatment of risk factors; early identification and treatment of heart attacks and strokes; and prevention of recurrent cardiovascular events" (HHS, 2010).

For 2020, the goal remains to improve cardiovascular health through a four-fold approach. Figure 2.5 further illustrates the alignment of the (paraphrased) *Healthy People 2020* objectives for heart disease and stroke across the four approaches. It includes, with emphasis, the newly introduced Objective HDS-1: "(Developmental) Increase overall cardiovascular health in the US population". This, in *Healthy People* terms, is classified as a "developmental objective" – of sufficient importance to be listed but awaiting full development of indicators and target levels before being formally adopted; this must be accomplished before mid-decade for the objective to be retained. It should be noted that a number of *Healthy People 2020* objectives important for heart disease and stroke prevention are presented under other focus areas: diabetes, health related quality of life and well-being, nutrition and weight status, physical activity, social determinants of health, and tobacco use. A comprehensive view of relevant objectives requires attention to each of these additional focus areas.

Figure 2.5: *Healthy People 2020* Objectives for Heart Disease and Stroke Prevention (HHS, 2010)



CVD, cardiovascular disease; HDS, heart disease and stroke; BP, blood pressure; Rx, treatment; Sns/Sxs, signs/symptoms; EMS, emergency medical services; OHCA, out-of-hospital cardiac arrest; CHD, coronary heart disease; CHF, congestive heart failure.

(Source: HHS)

Importantly, population improvement in cardiovascular health can occur with effective intervention at any of the four stages – preventing risk in the first place, reducing it once present, limiting functional loss from acute events, or improving prognosis for survivors of these events. Three other objectives are highlighted in bold because, although proposed, they were not adopted for *Healthy People 2020* even as developmental objectives: incidence of heart disease and stroke, 30-day survival for CHD and stroke, and recurrence rates for CHD and stroke.

A close parallel between *Healthy People 2020* in this respect and the innovative, arguably revolutionary, AHA's 2020 Impact Goal will be readily apparent: The American Heart Association's goal is "to improve the cardiovascular health of all Americans by 20% by 2020, while reducing death from CVDs and stroke by 20%" (Lloyd-Jones, 2010; Labarthe, 2012b). Consequences of this bold declaration include a new focus on cardiovascular health, in contrast to disease, in order to define it and to specify metrics by which to set intervention targets and assess the present status and future change in the whole population.[2]

This new understanding of cardiovascular health has major implications for policy and practice in heart disease and stroke prevention. Improving cardiovascular health invokes two broad approaches, discussed above in connection with global cardiovascular health.[3] The familiar strategy of risk factor detection and control can in principle move individuals from poor to intermediate or intermediate to ideal cardiovascular health – the remedial approach. Less familiar, though increasingly recognized, is the strategy of preventing cardiovascular risk in the first place, seen now as preserving ideal cardiovascular health – the primordial approach. Data on the cardiovascular health metrics from NHANES

2 Results of this work are shown in Table 2.1
3 See Section 1.3

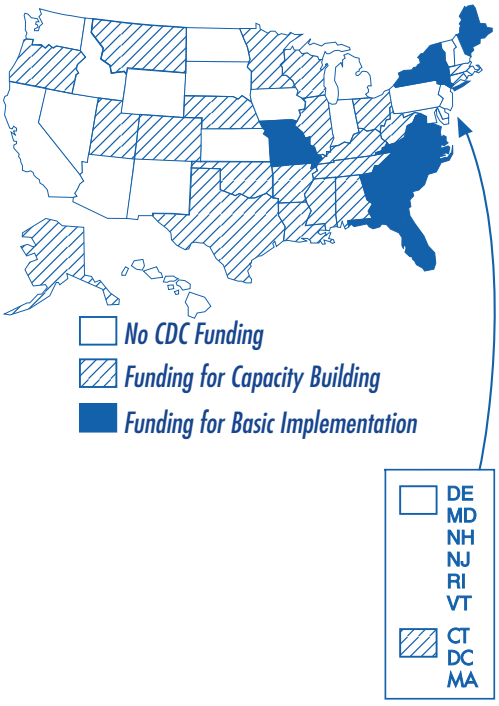
summarized in the 2011 AHA Statistical Update first demonstrated not only the very low prevalence of ideal cardiovascular health in adults, but a sharp decline in prevalence of having even four to five metrics at ideal levels, from below age 20 to age 20 and above – from 47% to 16%. There is a marked *loss of ideal cardiovascular health from childhood on*, a fact that underscores the need for aggressive implementation of primordial policies and practices to preserve cardiovascular health beginning in childhood, if the goals and objectives of both *Healthy People 2020* and the AHA are to be achieved (Roger, 2011).

Heart Disease and Stroke Prevention Programs in States and Communities

State-level Heart Disease and Stroke Prevention Programs were first implemented through CDC in 1998 in eight states with exceptionally high cardiovascular mortality. By 2002, growth in Congressional appropriations for these programs provided funding for 29 states and the District of Columbia. But more than 50 million Americans resided in states still lacking any level of support for these programs.

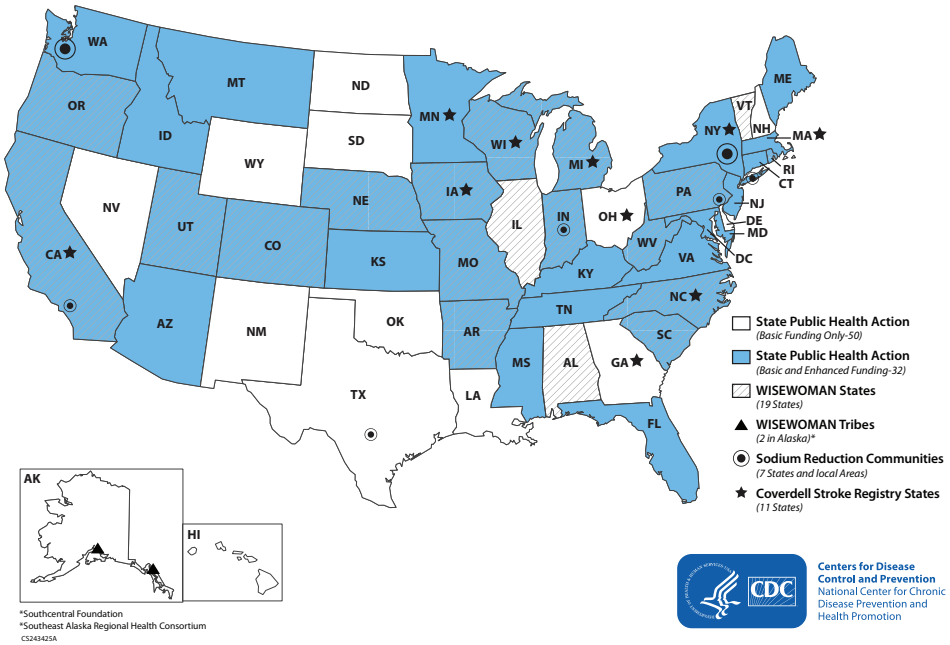
New policies for funding state-level public health programs for chronic disease prevention have now been implemented such that every state will have a core level of support for heart disease and stroke prevention, in conjunction with other components essential for effective promotion of cardiovascular health and prevention of cardiovascular and other NCDs. The map of state heart disease and stroke prevention programs in 2003 (Figure 2.6) identified the 29 funded states including the District of Columbia (DC). Ten years on, all 50 states and DC receive support for these programs (Figure 2.7). Planned funding by state ranges from $500,000 to $750,000 for the basic component, in all states, and an additional $1.2 to $1.7 million for an enhanced component awarded competitively to 32 states.

Figure 2.6: CDC Funding for State Programs, 2002 (HHS, 2003)



(Source: HHS)

Figure 2.7: CDC Funding for State Programs, 20013 (CDC, 2014)



(Source: CDC)

According to CDC's National Center for Chronic Disease Prevention and Health Promotion:[4]

> Four CDC programs work together through this program to support chronic disease prevention programs nationwide. Those programs are: diabetes; heart disease and stroke prevention; nutrition, physical activity, and obesity; and school health. These chronic diseases often happen at the same time and are the result of risk factors that are related. The strategies to prevent these health conditions are often similar and by combining approaches, public health programs can work together to be more impactful and efficient. This combined effort builds upon lessons learned in controlling diabetes, heart disease, and obesity, and promoting school health.
>
> States focus work in four areas:
>
> 1. Epidemiology, surveillance, and evaluation to inform, prioritize, and monitor diseases and risk factors and the delivery of interventions.
> 2. Environmental strategies that reinforce healthful behaviors and expand access to healthy choices.
> 3. Health systems interventions to improve the delivery and use of clinical and other preventive services.
> 4. Clinical and community linkages to better support chronic disease self-management.
>
> The funding award has three short-term goals:
>
> 1. Improve environments in worksites, schools, early childhood education

4 For more information, visit www.cdc.gov/nccdphp/programs

services, state and local government agencies, and community settings to promote healthy behaviors. Also, to expand access to healthy choices for people of all ages related to diabetes, cardiovascular health, physical activity, healthy foods and beverages, obesity, and breastfeeding.

2. Improve the delivery and use of quality clinical and other health services aimed at preventing and managing high blood pressure and diabetes.

3. Increase links between community and clinical organizations to support prevention, self-management and control of diabetes, high blood pressure, and obesity.

The program funds two components with project periods of up to 5 years. All states and the District of Columbia are funded for a non-competitive, **basic component**. In addition to basic funding, 32 states are funded for a competitive, **enhanced component**. [Emphasis added]

With other major chronic disease programs from CDC, this new approach offers long-awaited opportunities for enhanced coordination and collaboration across programs.

While many of CDC's heart disease and stroke prevention activities have traditionally been directed to states, a recent emphasis has been placed on direct support to communities, through such programs as Racial and Ethnic Approaches to Community Health, Steps to a Healthier US, Communities Putting Prevention to Work, and most recently the Community Transformation Grants (CTGs) provided under Title IV Section 4201 of the ACA. Collectively, these programs greatly increase support for selected communities to apply known effective strategies to prevent major chronic diseases and to improve quality of life. The CTGs alone are supporting 61 state/territorial and local/municipal health consortia, investing more than $175 million to reach nearly 130 million people and to bring about fundamental change in community characteristics to promote improved health.

Yet another recent development is the appearance of "little clinics" or "minute clinics" in a variety of settings – especially in pharmacies and grocery stores – with potential to be leveraged into focal points for support of lifestyle and behavioral changes regarding diet, physical activity, and medication adherence. This type of "disruptive innovation" may offer a valuable community resource to support prevention of cardiovascular and other chronic diseases.

Much has changed – and is continually changing – with new policies and programs for heart disease and stroke prevention today, constituting significant advances since 2003.

2.3: New Tools

New Tools for Communication

Social Media

Since the launch of the original *Action Plan* in 2003, social media – virtual communities where users create and share information – has risen to become a dominant source for

news, information, and discussions. Through popular websites such as Facebook, Twitter, LinkedIn, Reddit, and Pinterest, organizations can deliver health related messaging to millions of individuals throughout the world.[5] The American Heart Association's Go Red for Women, Million Hearts, GHDonline, the World Heart Federation's World Heart Day, and NCDFREE are examples of campaigns that have successfully used social media to inform and engage large target audiences.[6]

The Policy Depot

Recognizing the need to increase the capacity of NCD policy stakeholders worldwide, the National Forum launched the Policy Depot on World Heart Day (September 29), 2012.[7] The Policy Depot is a social community that enables users to explore and develop NCD policy solutions at local, national, and global levels. An entirely digital platform, the Policy Depot connects decision-makers, practitioners, and researchers to relevant policies, resources, and other professionals.

Rather than providing static content (such as reports, research, or position papers), the Policy Depot emphasizes the unique role of the individual policy stakeholder and the dynamic, ever-changing environment in which he/she does policy work. This tailored, multi-dimensional approach creates opportunities for individuals to develop meaningful cross-sector and geographically diverse collaborations that are needed to implement evidence-based preventive NCD policies.

Vital Signs

Collection of data through NHANES and other sources on major risk factors as high blood pressure and cholesterol has contributed to a recent CDC communications program called *Vital Signs*.[8] Typically each monthly report is accompanied by a supporting scientific review in CDC's *Morbidity and Mortality Weekly Reports* as well as press releases, podcasts, and other communications. The September 2013 edition reported that 200,000 cardiovascular deaths per year due to ischemic heart disease, stroke, chronic rheumatic heart disease, and hypertensive disease in people under 75 years of age are preventable (CDC, 2013a).

CDC Grand Rounds

Also noteworthy in connection with communications and media engagement is the recently introduced program of "CDC Grand Rounds" a monthly one-hour presentation by internal and external public health experts that is webcast and archived for future viewing. Programs in the cardiovascular arena to date have addressed sodium reduction (April 21, 2011), Million Hearts (February 28, 2013) and hypertension control (May 21, 2013).

5 www.facebook.com; www.linkedin.com; www.reddit.com; www.pinterest.com
6 www.goredforwomen.org; http://millionhearts.hhs.gov/; http://ghdonline.org/; www.world-heart-federation.org; http://ncdfree.org
7 www.policydepot.org
8 For more information, visit: www.cdc.gov/vitalsigns

New Tools for Intervention

mHealth

At the individual level of intervention, whether for behavior monitoring or introduction of specific preventive measures, mobile health technology (mHealth) is advancing rapidly with innumerable applications being developed and evaluated for their utility in preventive programs. These represent another example of disruptive innovations with potential for radical change in the way preventive strategies are deployed.

Electronic Health Records

Electronic health records (EHRs) are digital patient records that can be accessed and updated in real time. As of 2012, 72% of office-based medical practices are using an EHR system and these systems present an opportunity to identify and monitor trends in prevalence, treatment, and control of CVD at the primary care level.[9]

2.4: New Partners

The National Prevention, Health Promotion, and Public Health Council

At the global level, calls for engagement of multiple sectors of government in national health policy have become common, a concept echoed in the 2010 IOM report on promoting cardiovascular health in the developing world (IOM, 2010). Dual objectives are to insure that health issues are considered in policies in every area ("health in all policies") and that health policies reflect input and commitment beyond the health sector alone ("all-of-government policies").

The Affordable Care Act provides for establishment of the National Prevention, Health Promotion, and Public Health Council (National Prevention Council), composed of the US Surgeon General as Chair, with Secretaries of HHS, Agriculture, Education, Transportation, Labor, Homeland Security, and Assistant Secretary for Indian Affairs; Directors of the Office of National Drug Control Policy and the Domestic Policy Council; the Administrator of the Environmental Protection Agency; the Chairmen of the Federal Trade Commission and the Corporation for National and Community Service; and heads of other Federal agencies as deemed appropriate.

The charge to the National Prevention Council is broad, including provision of leadership and coordination across the Federal government with respect to "prevention, wellness and health promotion practices, the public health system, and integrative health care in the United States". The Council is further charged, "after obtaining input from relevant stakeholders," to "develop a national prevention, health promotion, public health, and integrative health care strategy that incorporates the most effective and achievable means of improving the health status of Americans and reducing the incidence of preventable illness and disability in the United States". Additional components of the charge further empower the Council to recommend policies specifically to address tobacco

9 See Section 3.1

use, sedentary behavior, and poor nutrition, and to propose innovative approaches to transformative models of prevention at both community and individual levels.

This partnership across Federal agencies is now well along with its charge. It provides a new context for Federal health policy with potential to achieve an altogether new level of policy coherence and support across government departments and agencies in the interest of the public's health.

Bridging Public Health and Clinical Care

Nationally, within the context of health reform, many clinical health systems are exploring innovative models that are transitioning away from disjointed fee-for-service care and are instead focusing on improving health outcomes and containing costs through coordinated actions with public health and other sectors, including social services. As approaches to improving health for patients and the population evolve, substantial opportunities are emerging for public health and clinical care not only to collaborate at the community level, but also to become integrated. This was the focus of a 2012 IOM report, *Primary Care and Public Health: Exploring Integration to Improve Population Health,* initiated by CDC and Health Resources and Services Administration, the principal public health and primary care agencies of the Federal government (IOM, 2012). This report emphasized that the health of our nation, its individuals, and its communities is dependent upon both the public health and clinical medicine/healthcare systems. Health status is a result of multiple factors, including healthcare access and quality, clinical preventive efforts and health behaviors as well as increasingly recognized social, environmental and economic determinants that must be addressed for optimal outcomes and improvements in health equity. Challenges to this task are substantial, but promising opportunities for collaboration between these sectors are emerging that may yield significant and lasting improvements in the health of individuals, communities, and populations. (IOM, 2012).

As characterized by Landon and others:

> The efforts of the primary care clinician and the public health official on behalf of the patients and communities they jointly serve must be increasingly coordinated, complementary, mutually accountable, well informed by data, and comprehensive. The policy, practice, and information environments are now conducive to achieving the elusive goal of a transformed, robust, and equitable population health system (Landon 2012, p 462).

A practical illustration is provided by efforts of the Association of Academic Health Centers to build a movement of its Centers nationally to address social determinants of health. Leading Centers were joined by CDC, the de Beaumont Foundation, and the Robert Wood Johnson Foundation, among others, in a 2012 meeting to advance this idea (AAHC, 2013). The rationale for this engagement in terms of the business case for academic health centers had been addressed in an earlier Association of Academic Health Centers report calling attention to the opportunities and challenges involved (Knettel, 2011). Others have also called upon providers and health systems to incorporate community prevention and public health collaboration as part of their overall models for achieving cost savings and improved outcomes (Trust for America's Health, 2013).

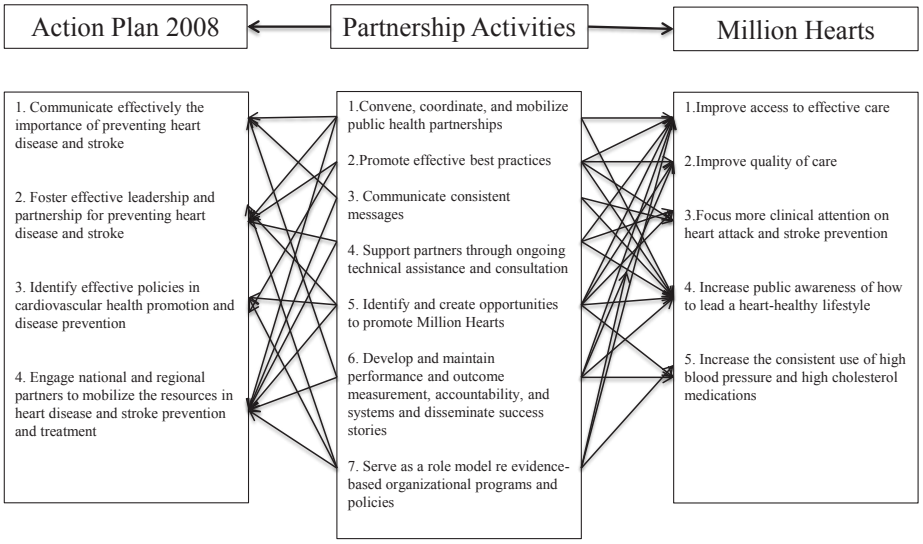
The CDC Million Hearts Collaboration

In response to CDC's 2012 announcement of a new partnership initiative, the National Forum joined with the AHA/American Stroke Association, the Association of State and Territorial Health Officials/National Association of Chronic Disease Directors/Cardiovascular Health Council, and National Association of County and City Health Officials as co-leader organizations and successfully proposed establishment of the CDC Million Hearts Collaboration.[10] The American Heart Association serves as the fiscal agent for management of the Collaboration, with each overall partner organization participating through its leadership and its entire constituency. The 2008 Update of the *Action Plan* was central to the proposed work of the Collaboration, as will be the present Ten-Year Update.

Because a dual focus of CDC's new initiative is both to implement recommendations of the 2008 Update to the *Action Plan* and to support and expand partner engagement in Million Hearts, it was important to demonstrate alignment between the requested partnership activities and the *Action Plan* on the one hand, and Million Hearts on the other.

10 Formerly the Partnership to Prevent Heart Disease and Stroke

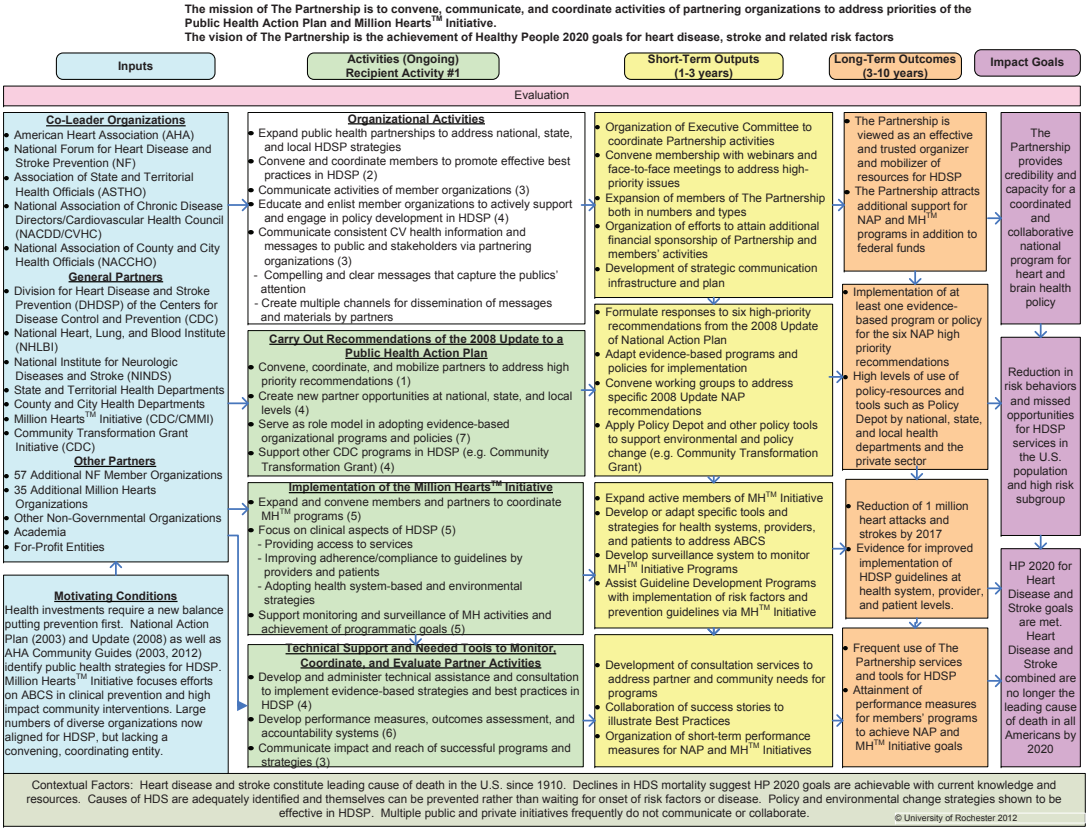
Figure 2.8: Activities of the Collaboration in Support of the *Action Plan* Update 2008 and Million Hearts Priorities (CDC Million Hearts Collaboration, 2012a)



(Source: CDC Million Hearts Collaboration)

The scope of work proposed for the Collaboration, and therefore closely related to that of the National Forum, is demonstrated by a comprehensive logic model.
This new partnership creates unprecedented opportunities, with support of CDC, to build on the strengths and resources of leading non-Federal organizations in heart disease and stroke prevention and public health, at national, state, and community levels.

Figure 2.9: The Collaboration Logic Model (CDC Million Hearts Collaboration, 2012b)



(Source: CDC Million Hearts Collaboration)

Reaching Out and Bringing In

The specific charge to the Collaboration to bring new partners into the Million Hearts Initiative presents a need, opportunity, and vehicle to broaden the national constituency for heart disease and stroke prevention. The goal is to represent more robustly than before not only such areas as health systems, IT, communications, and economics, but also agriculture, environmental quality, urban planning and development, life insurance underwriting, and other areas not yet engaged. The principle is commonly invoked of bringing stakeholders into discussions, decisions, and actions regarding the public's health, though reference may be to interests close to health care and public health agencies and organizations (Magnan, 2012). The National Prevention Council represents a much broader concept and provides a template for emulation by states and communities.

What is new in heart disease and stroke prevention since 2003 and 2008? The foregoing highlights make clear the value of taking stock of what has changed. New understanding, new policies and programs, new tools, and new partners offer new, unprecedented opportunities to increase our impact in addressing the continuing needs and challenges in heart disease and stroke prevention – both nationally and globally.

3: Priorities in the Call to Action

The third pillar – and the heart – of the 2003 *Action Plan* is Section 3, "Recommendations: A Call to Action". The recommendations were the product of work in early 2002 by five Expert Panels, each charged to address one of five "essential components" of a comprehensive public health action plan. The process is documented in the appendix to the 2003 Action Plan (HHS, 2003). The respective panels were:

- Policy and Programs (*Taking action*): putting present knowledge to work;
- Capacity Development and Support (*Strengthening capacity*): organization and structure of public health agencies and partnerships;
- Monitoring, Evaluation, and Communication (*Evaluating impact*): monitoring the burden, measuring progress, and communicating urgency;
- Research in Cardiovascular Health Promotion and CVD Prevention (*Advancing policy*): defining the issues and finding the needed solutions; and
- Global Cardiovascular Health (*Engaging in regional and global collaboration*): multiplying resources and capitalizing on shared experience.

Altogether 22 recommendations were developed by the panels and finalized after critical review by the ad hoc meeting of the National Forum for Heart Disease and Stroke Prevention in September 2002.[1] These were reviewed by the oversight Working Group, who considered that two cross-cutting areas touched upon by the panels warranted particular prominence. These were deemed to be "fundamental requirements" and were described as follows (HHS, 2003):

Effective Communication: The urgency and promise of preventing heart disease and stroke and their precursors (i.e., atherosclerosis, high blood pressure, and their risk factors and determinants) must be communicated effectively by the public health community through a new long-term strategy of public information and education. This new strategy must engage national, state, and local policy makers and other stakeholders.

Strategic Leadership, Partnerships, and Organization: The nation's public health agencies and their partners must provide the necessary leadership for a comprehensive public health strategy to prevent heart disease and stroke.

The two fundamental requirements and five essential components together constitute the seven broad areas in which a total of 69 action steps were proposed. Prioritization was needed and was accomplished through review of their interests and capacities

1 See Appendix Table 7

by member organizations in the formalized National Forum (Labarthe, 2005). The result was adoption of eight priority tasks for emphasis (two in the area of evaluating impact), for example, to assess national, state, and local needs and capacities in surveillance of cardiovascular health and disease, with recommendations to address them (Goff, 2007).

The 2008 Update reaffirmed the 2003 recommendations and added two:[2]

- 8a: to strengthen accountability of public health agencies regarding quality of care in heart disease and stroke and provide additional technical assistance and support for this function; and
- 8b: to call for further research and program evaluation relevant to public health practice in this area.[3]

These recommendations remain relevant and continue to indicate abundant opportunities for meaningful action across the wide spectrum of cardiovascular health promotion and disease prevention.[4] Interested organizations and individuals should have no difficulty in identifying points where they can have substantial impact. At the same time, there is value in recognizing especially opportune circumstances, in light of today's landscape, in which to take immediate action.

In this context, we propose seven Action Priorities for 2014 and beyond, corresponding to the topics of the two fundamental requirements and five essential components of the Plan. Table 3.1 presents each Action Priority under the relevant component, identifies the topical focus of the proposed activity, and briefly describes the action needed.

3.1: Seven Immediate Action Priorities

In keeping with the original *Action Plan*, the needed actions can be supported by brief statements of their rationale, examples of actions to be taken, and expected outcomes – projections of what success could look like. These are followed by discussion of strategies for dissemination and implementation – what the National Forum and others can do, in principle, to put this Update to work.

Prevention and Public Health

The first of the three overarching tasks set out in the 2003 *Action Plan* was to "Strike a new balance in our investment in health by putting prevention first". The Affordable Care Act is, among its many features, a federal legislative achievement with great promise to strengthen prevention and public health and improve the health of the nation (The Patient Protection and Affordable Care Act, 2010). This aspect of the law and its impact on federal policy is largely unrecognized by the public and can be presumed so by many policy makers as well.[5] Only the Prevention and Public Health Fund has attracted the attention of many in Congress with a view to reallocating the appropriated funds for other purposes.

2 See Appendix Table 7
3 The fundamental requirements and all of the recommendations are provided, for reference, in the Appendix.
4 As shown in the Action Framework, Figure 2.1.
5 See Section 2.2

Table 3.1: Seven Immediate Action Priorities for 2014 and Beyond

Priority	Focus	Action Needed
Effective communication	Prevention and public health	Communicate to legislators, policymakers, and the public at large the nation's vital stake in sustaining and building upon the prevention and public health provisions in the Affordable Care Act, e.g., the National Prevention Council, Prevention and Public Health Fund, and others.
Strategic leadership, partnerships, and organization	Public health – healthcare collaboration and integration	Integrate public health and health care into a public health system effective in supporting community-level prevention policies and programs, e.g., the Million Hearts Initiative.
Taking action	Cardiovascular health and health equity	Develop, advocate, and implement policies, programs, and practices aimed to improve the nation's cardiovascular health in terms of the Healthy People 2020 objectives and AHA metrics – addressing tobacco use, overweight/obesity, physical activity, healthy diet (including reduction in sodium and artificial trans fat intake), blood pressure, cholesterol, and fasting plasma glucose); and ensure that all such actions reach everyone, especially those most vulnerable due to unfavorable social and environmental conditions.
Building capacity	Prevention workforce	Make full use of resources for education and training of the prevention workforce at local, state, national, and global levels.
Evaluating impact	Monitoring cardiovascular health	Advocate for a comprehensive, robust and timely system of monitoring cardiovascular events (heart attacks, stroke, heart failure) and cardiovascular health metrics for the US population, including full adoption of the "developmental" heart disease and stroke objectives of Healthy People 2020.
Advancing policy	Research on critical questions to advance policy and practice	Pursue needed implementation and dissemination science and health economics research, including needed education and training for this research, in support of health policy development, implementation, and dissemination.
Engaging in regional and global collaboration	Initiatives linking CVD and NCD prevention	Undertake collaborations in major regional and global cardiovascular health and NCD initiatives, in the interest of improving cardiovascular health and reducing the burden of NCDs in the United States and globally.

(Source: Authors)

Under the *Action Plan's* fundamental requirement for effective communication, high priority is accorded to communication with national, state, and local policy makers and stakeholders – including the public at large – of the importance of the prevention and public health provisions of the ACA. These are found in Title IV, Prevention of Chronic Diseases and Improving Public Health, and elsewhere in the law (Koh and Sebelius, 2010). To do so, many organizations – including the National Forum – have partnered with Trust for America's Health in communications to members of Congress to preserve the Fund and to defeat efforts to repeal the ACA altogether.[6]

Trust for America's Health website includes a Taking Action button that identifies multiple points where organizations and individuals can take useful steps in the interest of prevention. The Prevention Institute provides tools to promote prevention, including models and templates for letters to editors, political leaders, and others.[7] The opportunity remains to develop a long-term communication strategy for this purpose that enlists in particular the efforts of those committed to heart disease and stroke prevention. The new communication tools utilized by CDC are another means of reaching the public effectively with current information for this purpose.[8] Knowing of these resources and using them opportunistically is something every individual and organization can do.

6 For more information, visit: www.healthyamericans.org/health_issues
7 For more information, visit: www.preventioninstitute.org
8 See Section 1.3

Success in this effort will lead to sustained support for prevention and public health, not only in terms of the ACA but in local, state, and national legislation, regulation, and policy implementation. The Prevention and Public Health Fund will be retained and extended beyond the current appropriation as a continuing investment in the public's health.

Public Health-Healthcare Collaboration and Integration

Within the context of health reform, many clinical health systems are exploring innovative models that transition away from disjointed fee-for-service care. Instead, they focus on improving health outcomes and containing costs through coordinated actions with public health and other sectors, including social services, providing context for this Action Priority.

This focus supports the second overarching task – to "transform our public health agencies into effective instruments for leading policy and environmental change and for supporting the entire range of public health approaches to heart disease and stroke prevention".[9]

This emphasis on bridging public health and clinical care is well illustrated by the Million Hearts initiative, which includes both clinical preventive services addressing the ABCS and community interventions to reduce consumption of sodium and trans fats and promote smoking cessation. The Initiative has been identified by Wright and others as the place "Where population health and clinical practice intersect" (Wright et al., 2012). Writers from the ACC note that "Success will not be automatic. It will require focus, resources, and, most challengingly, some level of behavioral change on the part of physicians, patients, organizations, and government entities". Several actions are outlined by which ACC will collaborate in Million Hearts by deploying assets unique to this organization. Formation of the CDC Million Hearts Collaboration, in which the National Forum joins with other national organizations to support the Initiative (and implementation of the *Action Plan*) is a further example.

CDC's new approach to its chronic disease prevention programs at the state level, State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity and Associated Risk Factors and Promote School Health shows action at the federal and state levels to achieve an unprecedented level of integration across chronic disease prevention programs.[10] Two of the program's four focus areas are health systems interventions to improve the delivery and use of clinical and other preventive services, and clinical and community linkages to better support NCD self-management.

Successful outcome of these activities will be not only improvements in population health but development of a new infrastructure – a public health system – which will lead more effectively in exploiting opportunities and meeting future challenges in population health.

Cardiovascular Health and Health Equity

Achieving improvement in cardiovascular health and progress toward health equity invoke the principle expressed in the third overarching task for the *Action Plan* – to "prevent the

9 Emergence of a new emphasis on the relation between public health and healthcare is discussed in Sections 2.2 and 2.4 above, in relation to new programs and new partners for heart disease and stroke prevention.
10 See Section 2.2

causes themselves of heart disease and stroke when possible, upstream, not only waiting to treat the causes or their consequences, downstream". This calls for taking action, now, putting present knowledge to work to promote cardiovascular health and to prevent heart disease and stroke, for the benefit of all.

The concept of cardiovascular health is now taking hold as a focus of policy and practice (Lloyd-Jones et al., 2010). In contrast to treatment of established cardiovascular risk and disease, it holds great promise for both rapid improvements in the population distribution of metrics of cardiovascular health and long-term reductions in the otherwise unending progression from cardiovascular health to disease, with advancing age, in present and future generations. The targets of action are many, as represented by the seven metrics defined by the AHA: four behaviors – tobacco use, overweight/obesity, physical activity, healthy diet score; and three factors – blood pressure, cholesterol, and fasting plasma glucose. Each of these offers multiple potential interventions, especially the healthy diet score that includes several specific food categories and nutrients. While these several targets have been central to CVD prevention for many years, their consolidation, in a positive mode, to create a composite cardiovascular health score offers a new way of framing intervention strategies and measuring their progress in a more comprehensive manner than previously.

Two illustrations where population-level action is needed are reduction in sodium intake and cessation of tobacco use. Average sodium intake of the US population far exceeds levels that are safe, contributing directly to the high prevalence of hypertension, which remains uncontrolled for the majority of those affected. Reduction of the sodium content of processed foods and food service products is essential to create consumer choice and restore healthier intake. The prevailing US diet is poor for children and adults and is urgently in need of improvement, not only with respect to sodium intake, but also with deficiencies in intake of fish, fruits and vegetables and excess of sugar-sweetened beverages.

Demonstrated effectiveness of tobacco quitlines and clean air initiatives in reducing smoking and tobacco smoke exposure indicates the value of continued and intensified action to implement these key public health measures. Closer collaboration between tobacco control and heart disease and stroke prevention can be expected to enhance the impact of efforts of both.

Both the AHA 2020 Impact Goal and the *Healthy People 2020* objective on cardiovascular health address improvements in the whole population (Lloyd-Jones et al., 2010; HHS, 2010).[11] Pursuit of these objectives both requires and fosters improvement in health equity across society. Such improvements are required, because existing disparities may obstruct efforts to improve cardiovascular health for many and must therefore be an explicit focus of intervention strategies; they are fostered, because promoting cardiovascular health from the beginning of life and preventing its decline throughout childhood and adolescence offer the prospect of preventing inequity in health before it begins.

Success in these efforts will result in continuous improvement in the proportion of the population at all ages, and in every race/ethnic group and education level, who have ideal cardiovascular health metrics, both singly and as the composite score.

11 See Figure 2.5

Prevention Workforce

Every state now has core support for heart disease and stroke prevention programs in conjunction with those for diabetes, obesity, associated risk factors, and school health. The prevention and public health workforce is in greater need than ever before for education and training of leadership and staff, as well as decision-makers, to understand, execute, and evaluate effective interventions to achieve improvement in cardiovascular health.

In order to make full use of resources for education and training of the prevention workforce at state and local levels, several pieces must be in place – knowledge and awareness of: the specific needs for such training and education (what, and by whom?); adequacy of the tools and technologies to meet the needs (what, and how accessed?); resources to support their utilization by those who need them (budget, and technical resources?); and means to overcome barriers to their use (time allocation, organizational priority, and out-of-state travel for training?).

Actions to address these several needs for education and training could be taken by interested organizations, whether public health agencies, academic institutions, private foundations, and others – likely best through partnerships among these.

Success would be measured in terms of establishment of virtual banks and libraries of needed materials, with expert live technical support; ongoing assistance in addressing issues in public health practice for heart disease and stroke prevention; improvement in health agency functioning; and increased stability and longevity of the prevention workforce at all levels and in all settings.

Monitoring Cardiovascular Health

Disease surveillance systems enable policymakers, clinicians, and other stakeholders to measure the scope and cost of diseases as well as make informed decisions on priority setting, program development, and evaluation. In the United States today, CVD surveillance is seriously limited by the lack of nationally representative data on non-fatal CVD incidence – including acute myocardial infarctions, heart failure, and stroke – as well as survival and recurrence rates, each of which is essential for measurement and understanding of the distinct contributions of prevention and treatment to CVD morbidity, mortality, disparities, and costs.

In addition, *Healthy People 2020* includes 24 objectives in the heart disease and stroke focus area, many of which are classified as "developmental".[12] Each of these objectives is important for a comprehensive cardiovascular surveillance system. For example, Objective HDS-1, "to improve the cardiovascular health of the US population", directly supports the emerging national emphasis on cardiovascular health and can easily be elaborated in terms needed for permanent adoption.

The action needed, with some urgency, is broadly to advocate for a comprehensive, robust, and timely system of monitoring cardiovascular events (heart attacks, heart failure, and strokes) for the United States population, including full adoption of the "developmental"

12 See Section 2.1 and Figure 2.5

heart disease and stroke objectives of *Healthy People 2020*. Components of this action are to develop the specific plans for national data collection that will meet federal requirements and to work with the federal Office of Health Promotion and Disease Prevention to bring about the needed adoptions. Points of reference for this work include the landmark review and recommendations from the National Forum, including the commissioned report by Goff et al. 2007, the IOM report on surveillance (IOM, 2011), and the interim reports and presentations from the National Forum. Specifically for HDS-1, the objective to improve cardiovascular health of the population, the metrics already defined by AHA on the basis of their current availability in national probability samples of the population (i.e., NHANES) should enable quick development of the needed metrics, targets, and subgroup criteria (age, sex, race/ethnicity) to meet *Healthy People 2020* requirements.

Success in this effort would be indicated by a fully developed set of objectives in the Heart Disease and Stroke Focus Area within *Healthy People 2020*, and a mid-course review (in 2015) that would reflect currently available data on each objective.

Research on Critical Questions to Advance Policy and Practice

Implementation and dissemination science, and the broader field of health services research, address practical questions about the functioning of health systems – their organization, operation and effectiveness -- and clinical-level health policy and practice, as well as implementation and dissemination of effective action for their improvement. Health economics, broadly, concerns questions about health care expenditures and financing, costs and cost-effectiveness of alternative policies and practices, individual and societal values and choices of behaviors and policies concerning health.

These areas of research are fundamental to health policy development and implementation and warrant substantially increased investment, yet there is a sense that work in this area – at least as it applies to cardiovascular health and CVD prevention – remains at an early stage of development and application. This may be a reflection of the predominance of etiologic research and interest in causal mechanisms of disease rather than the translation of such knowledge into policy and practice, or evaluation of the public health impact of policies and programs. But in the present climate, these latter questions are of paramount importance for policy makers and stakeholders, and for the public at large.

Actions needed in this area would include: identification of critical questions; development of a research agenda to guide setting of research priorities and investments; training and education of the research workforce needed to address these questions; conduct of the needed implementation and dissemination science and health-economics research; and translation of the resulting new knowledge to support health policy development, implementation, and dissemination.

Success in this effort will be recognized by a visible, dynamic, and productive research enterprise that is contributing to solutions of policy dilemmas in setting health priorities, resource allocation, and public understanding of prevention and public health.

Initiatives Linking CVD and NCD Prevention

As outlined in Section 1.3, the global health arena has become substantially more engaged in addressing the diseases of major public health importance under the aggregate rubric of NCDs. Heart disease and stroke predominate among the NCDs in their contributions to the global burden of NCDs, as they do in the United States. Strategies of prevention are largely shared across these conditions, due to their roots in social determinants of health, or social and environmental conditions, population-wide behavior patterns, and common risk factors (Labarthe, 2012). The connection of CVD with the other NCDs, and even with HIV/AIDS, is made clear in the recent IOM report, *Promoting Cardiovascular Health in the Developing World: A Critical Challenge to Achieve Global Health* (IOM, 2010). The essential role of heart disease and stroke prevention in achieving targets for global health is apparent, as is the potential benefit of collaboration between those interested especially in heart disease and stroke prevention and those with the broader mission of NCD prevention overall.

Consistent with this global view is the interest of the United States in collaboration in those efforts regionally and globally where we can contribute, and gain from the collective experience of all who are working toward these goals. From the US perspective for example, the importance of a focus on cardiovascular health, and not only on CVD, is a potentially important contribution to the work in other countries and regions. Conversely, the focus of others on strengthening primary care systems, and emulating or joining in systems of care developed previously for long-term medical management of HIV/AIDS, tuberculosis, and malaria, may be instructive for our initiatives toward integration of public health with healthcare

Action in this area would be to continue and further develop those collaborations with international partners where such mutual gain is likely. Examples of significant new initiatives at regional and global levels that appear to offer such opportunities are the Global Standardized Hypertension Control Program, in which CDC and PAHO have taken leadership for implementation in Latin America and the Caribbean; and the Global Action Plan of WHO, following the directive from the High-level Meeting of the United National General Assembly on prevention and control of NCDs globally. Individuals and organizations in the United States have the potential to contribute technical knowledge and experience to such activities and much to gain from shared experience through such collaboration. Work with the European Society of Cardiology, World Heart Federation, NCD Alliance, World Hypertension League, Global Forum on Cardiovascular Disease Prevention in Clinical Practice, and WHO's Global Coordinating Mechanism for NCDs are potential opportunities.

Success in these efforts will in part take the form of renewed commitments from the United States to support such work elsewhere in the world. It will also appear in importation of the resulting experience into domestic thinking about systems of care to manage the anticipated increase in cardiovascular and other chronic conditions with continued aging of the population and longer survival from acute and disabling cardiovascular events that we have yet to prevent.

3.2: Strategies for Dissemination and Implementation of the Ten-Year Update

The primary determinant of successful dissemination and implementation of the Ten-Year Update, and the seven Priority Actions discussed here, is whether leading organizations and individuals will commit to participation, through direct engagement or resource contributions, to undertaking the needed actions.

Organizations with missions related to heart disease and stroke prevention should address a series of questions: Which of the Action Priorities most closely relates to this organization? In which areas do our main opportunities lie for contributions in 2014 and beyond? What are the most promising new actions we can take that will have substantial impact on the cardiovascular health of the population and on prevention of heart disease and stroke?

By example, the National Forum has identified several priorities within its mission and resources that align with the Action Priorities above. These address health equity, reduction of population-level sodium intake, cardiovascular health and disease monitoring/ surveillance, and – in collaboration with the European Regional Office of WHO, CINDI, Bayer, and many other organizations – implementation of the Policy Depot. In addition, the National Forum is closely engaged in the Million Hearts Initiative through the CDC Million Hearts Collaboration.

A systematic approach to dissemination and implementation of the *Action Plan:* Ten-Year Update will be needed. After final adoption of the plan, the National Forum Board of Directors will consider its proposed strategies as well as how to encourage collaborative action in implementing the Ten-Year Update. These might include a series of publications to address each of the Action Priorities in greater detail, seeking venues for presentations to public and professional audiences, and utilization of social media to stimulate public discussion and debate about the underlying needs and opportunities for improvement in cardiovascular health. Organizations committed to heart disease and stroke prevention are encouraged to take similar assessments on how to carry forward the Action Priorities laid out in the *Action Plan*: Ten-Year Update.

To assess implementation, one opportunity may be use of the National Forum's Annual Meeting for discussion of the actions being taken – accounts from organizations as to their self-assessment to select among candidate activities, commitments made, and actions being taken, with what experience in the process. In this way, the culture of engagement can become increasingly widespread, reaching the whole of the National Forum membership, other organizations, and – with media engagement – well beyond.

4: Mobilizing for Action

The fourth pillar of the 2003 *Action Plan* was Section 4, "Implementation: Mobilizing for Action". One or more specific action steps were proposed for each of the two fundamental requirements and 22 recommendations of the plan as a guide to implementation, and expected outcomes were detailed for each action step. In this Update, we go beyond the original to consider mobilization especially at the community level, given developments in this direction over the interim since 2003. We note the rationale for community-level prevention, highlight the recent update to the AHA *Guide for Improving Cardiovascular Health at the Community Level*, and cite recent major community-level initiatives in the United States for prevention of heart disease and stroke and other NCDs.

4.1: Rationale for Community-Level Prevention

The social and environmental origins of heart disease and stroke have been well established and provide a sound rationale for interventions at the societal or population-wide level. While some environmental factors such as air pollution, or genetic factors such as familial hyperlipidemia play a role, long-term prospective studies have consistently identified a large proportion of population risk to be due to a relatively small number of behaviors and related risk factors such as smoking, diet, physical inactivity, obesity, hypertension, diabetes, and elevated blood cholesterol. While individual-level clinical interventions are effective, a greater proportion of the population could benefit from interventions that "change the context to make individual's default decisions healthy" (Frieden, 2010). Such population-wide interventions would affect children's adoption of health behaviors, impact all socioeconomic and educational strata, and could be implemented at relatively low cost (e.g., $1 per person per year). Indeed, a substantial portion of the reduction in heart disease and stroke in the United States since 1968 can be attributed to population-wide behavior change, such as reduction in the percentage of calories from saturated fat and the reduction in tobacco use (Labarthe, 2012). The complementarity of community-based intervention with individuals' preventive regimens is also apparent.

4.2: Guidance to Prevention at the Community Level

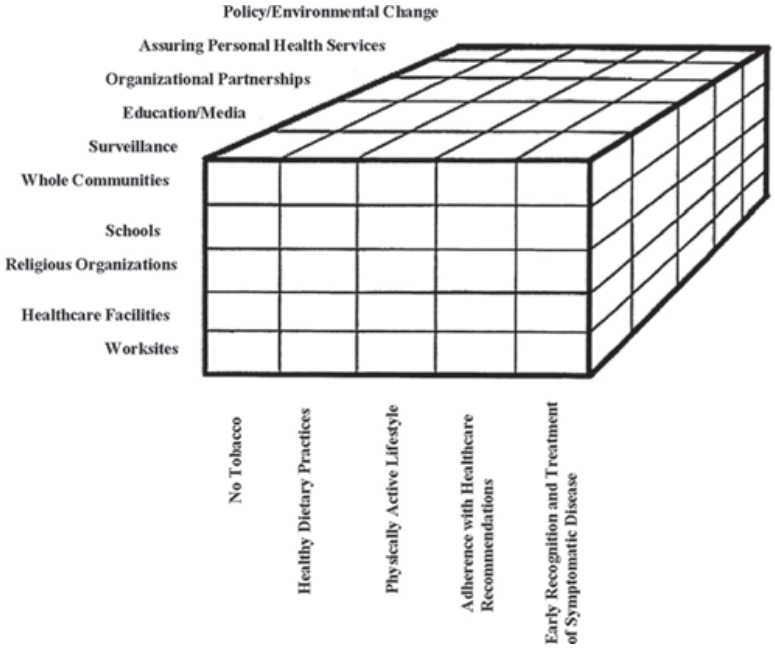
The work of the Task Force, is highlighted in Section 2.1: New Knowledge and Understanding. That discussion recognizes the role of this agency in review and assessment of evidence relating to potential community-level interventions and development of evidence-based recommendations. Those recommended interventions that relate to cardiovascular health, and the logic model to organize the further work of the Task Force in this area, are addressed there.

The compelling evidence for community-wide approaches to CVD burdens led to the development of the AHA's *Guide for Improving Cardiovascular Health at the Community Level* in 2003 as a companion document supportive of the original *Public Health Action Plan for Heart Disease and Stroke Prevention* (Pearson, 2003).[1] A review of resources for implementing the AHA Community-Level Guide followed in 2005 (Veazie, 2005). Most recently, the AHA Community-Level Guide was updated to reflect progress and new opportunities as of 2013, again as a companion to the *Action Plan* and consistent with *Healthy People 2020* and AHA's 2020 goals (Pearson, 2013).

The conceptual framework for population-wide cardiovascular health identifies three dimensions to guide interventions: the healthy behaviors sought, the community settings in which the interventions can be implemented, and the public health interventions that support behavior change (Figure 4.1) (Pearson, 2013). This 5 x 5 x 5 cube provides a comprehensive yet tailorable approach to current and future reductions in CVD burden.

1 The Federal Guide to Community Preventive Services, discussed in Section 2.1, is officially referred to as "The Community Guide"; for clarity, we refer here to the AHA publication as "The AHA Community-Level Guide".

Figure 4.1: Conceptual Framework for Population-Wide Cardiovascular Risk Behaviors Change: The Optimal Health Behaviors and Factors, Community Settings, and Public Health Interventions (Pearson, 2013)



(Source: *Circulation*)

The AHA Community-Level Guide describes optimal individual and population cardiovascular health behaviors, including no tobacco, healthy dietary practices, physically active lifestyle, adherence with healthcare recommendations related to screening, diagnosis, and treatment of risk factors, and early recognition of treatment of symptomatic disease. For each of these categories, the AHA Community-Level Guide provides the current prevalence in the United States identifying areas in greater need for intervention (e.g. fewer than 1% of Americans consume <1500 mg of salt per day).[2]

2 See Table 2.1

The AHA Community-Level Guide also identifies evidence-based recommendations, and the systematic reviews or evidence summaries on which they are based, for improving the optimal behaviors, as developed by Federal agencies (US Surgeon General, HHS, Department of Agriculture, The Guide to Community Preventive Services, and NHLBI) and private sector organizations (AHA, American Diabetes Association, and others). These guidelines represent the rapid expansion of community recommendations based on evidence from clinical trials, community trials, and population-wide studies.[3]

The AHA Community-Level Guide also identifies the expanding evidence base for interventions in specific settings, including entire communities, schools and other youth organizations, religious organizations, healthcare facilities, and worksites. Intervention goals and recommended actions are provided for each venue based on recommendations in guidelines from a number of governmental and private sector organizations. These recommendations then provide a menu of specific programs that governments or community leaders might propose for implementation in local settings.[4]

Finally, the AHA Community-Level Guide provides intervention goals and recommended public health actions to promote cardiovascular health. The report provides a compendium of more than 75 current programs and resources, each with its web link for ready access to the sponsoring organization or agency – public and private, volunteer organizations and foundations.[5] The broad categories addressed are:

- Surveillance
- Education
    - General health education
    - School and youth education
    - Worksite education
    - Healthcare facility education
- Community organization and partnering
- Ensuring personal health services
- Environmental change
- Policy change

4.3: Recent Community-Level Initiatives

Opportunities abound to link new community-level initiatives with ongoing programs in tobacco control, obesity prevention, and improvement in diet and physical activity, identified in this report. Examples of recent initiatives demonstrate the mounting pace of these activities.

3 See Appendix Table 8
4 See Appendix Table 9
5 See Appendix Table 10

The large expansion of the evidence and experience base for community-level prevention between 2003 and 2013 is obvious and is evidence of a growing movement toward community-focused prevention. This experience, from such programs as Racial and Ethnic Approaches to Community Health, Steps to a Healthier US, Communities Putting Prevention to Work, and others set the stage for a number of public and private initiatives stimulated by the ACA. For example, the CDC CTG program supports 61 state/territorial and local/municipal health consortia with $1/per person/year to establish programs to reduce chronic disease risk factors through environmental and policy changes.

The CTG program requires grantee communities and states to develop a community transformation plan through which to create healthier school environments; create infrastructure to support active living and access to nutritious foods in a safe environment; target multiple age levels with programs to improve nutrition, physical activity and smoking cessation, improve social and emotional wellness, and enhance safety; assess worksite wellness programming and incentives; highlight healthy options at restaurants and other food venues; prioritize strategies to reduce racial and ethnic disparities, including social, economic, and geographic determinants of health; and special population needs of all age groups, persons with disabilities, and both urban and rural populations.

Evaluation of these programs is to include monitoring of relevant health behaviors and indicators. Dissemination of experience and training in preventive strategies are provided for as well. The opportunities presented for schools of public health and local public health agencies to engage with health care providers in these programs are of major importance. Other provisions of the ACA for community-level action to prevent cardiovascular and other chronic diseases extend the potential reach of these programs even further (The Patient Protection and ACA, 2010). The Million Hearts Initiative discussed above, co-led by CDC and Center for Medicare and Medicaid, engages stakeholders to implement recommendations in community as well as healthcare settings. The community component of Million Hearts is to reduce tobacco use and exposure to second-hand smoke, reduce sodium content of food, and eliminate artificial trans-fats from the diet (Freiden, 2011).

As of 2013, the government official, religious leader, business owner, school administrator, or health system director has access to an infrastructure of evidence, policy, and partnership which strongly supports efforts to reduce the burden of heart disease and stroke in their local community.

5: Next Steps - Bringing Implementation to Scale

Mobilizing for action, especially on the population-wide approaches needed to preserve and improve cardiovascular health, will require a new balance in our investment in health, by increasing investment in upstream policies and programs – in short, putting prevention first. This is to enable two other public health imperatives to be realized, as contemplated in the 2003 *Action Plan*: transforming our public health agencies into effective instruments for leading policy and environmental change and for supporting the entire range of public health approaches to heart disease and stroke prevention, and preventing the causes themselves of heart disease and stroke, rather than waiting to treat the consequences of failure to do so.

5.1: Investing Upstream

In considering economic aspects of heart disease and stroke prevention, three central questions are:

- What are current and projected economic costs of these conditions to our society?
- What are current and projected investments in their prevention?
- What would be the impact of substantially increased investment in prevention on these economic costs?

The first question is addressed in Section 3.2 above, where the projected costs of all CVDs in the United States by 2030 would exceed $1 trillion (2008$; $818 billion in direct medical costs and $276 billion in lost productivity due to disability and premature death) (Heidenreich, 2011).[1] Economic costs to caregivers as well as non-economic costs to individuals, families, and communities of course add to the real total cost.

The second question concerns our investment in prevention. How much we invest in prevention is to date less well studied than our medical care expenditures.[2] A 1992 issue of the CDC's *Morbidity and Mortality Weekly Report* provides one answer: 3% of health expenditures were assignable to "activities that reduce the incidence, prevalence, and burden of disease and injury and enhance health by improving physical, social, and mental well-being" and included health promotion, health protection, and preventive health services (CDC, 1992).

More recently, the Hamilton Project of the Brookings Institution reported for 2007 that only 4% of the $1.7 trillion in national health expenditures was spent on prevention

1 See Section 3.2
2 These are not altogether distinct, because drug treatment to control risk factors would sometimes be included in the latter.

(Lambrew, 2007). The United States spends many hundreds of millions of dollars to purchase "health care services", but only a very small fraction of that is spent for services intended to protect and preserve it.

The third question has been addressed in part by estimating the return on investment from two strategies:

- First, Trust for America's Health reported that "an investment of $10 per person per year in proven community-based programs to increase physical activity, improve nutrition, and prevent smoking and other tobacco use could save the country more than $16 billion annually within 5 years. This is a return of $5.60 for every $1 invested" (Levi, 2008). The report presents state-by-state potential annual net savings and return on investment resulting from what they called "Strategic Disease Prevention Programs in Communities".

- Second, the Prevention Institute has advocated a national policy of indexing prevention investment to healthcare spending, reinvesting these savings. The Institute estimated that the impact of investing $5 for prevention for every $100 of personal healthcare spending (still only a 5% investment) would reach a break-even point at 20 years. At 30 years, $1.28 trillion would have been spent for prevention, $2.75 trillion would have been saved in reduced healthcare spending, with a national saving of $1.46 trillion. The effect would be to establish a virtuous cycle, with prevention producing savings to reinvest in further prevention activities (Cohen, 2007).

In addition, a wealth of information has come from study of large employee groups and worksites in which effective prevention programs have been implemented and evaluated. These settings constitute a prime target for upstream investment in prevention, aimed at keeping employees as healthy and productive as possible. In four large companies participating in the Health and Productivity as a Business Strategy study, annual medical and drug costs per 1,000 FTEs were approximately $110,000 for CHD, $75,000 for high cholesterol, and $40,000 each for both diabetes and hypertension – a total of more than $265,000 per 1,000 FTEs for cardiovascular-related conditions (Loeppke, 2007). However, the cost of lost productivity was more than four times the medical and drug costs. Combining medical, drug and productivity costs, high cholesterol, hypertension, and obesity alone cost these businesses more than $650,000 per 1,000 FTEs. The observation, in the context of this study, that "good health is a good business" suggests that such understanding of the benefits of good employee health may open new opportunities for investment in health in the workplace. Beyond the workplace alone, the case has been made that "a comprehensive investment in proven community prevention is important to larger business because they need the larger public health prevention infrastructure…" (Miller, 2013).

Actual cost data demonstrate convincingly that worksite prevention has paid – for Motorola, Johnson & Johnson, and Caterpillar (Goetzel, 2008). Specifically for CVD, the Asheville Project in North Carolina achieved marked improvements in risk factor control, CVD event rates, and related medical costs (Bunting, 2008). Georgia's Stroke and Heart Attack Prevention Program demonstrated cost savings relative to both usual care and no care by effectively managing high blood pressure and reducing the expected numbers of heart attacks and strokes (Rein, 2006).

Each of these settings, whether employee-based or community-based, is an integrated system. This means the payer for prevention upstream is also the payer for treatment of events and complications downstream. With a single accounting system, savings are readily identified. The more typical fragmentation of prevention and treatment between disconnected payers renders the savings from prevention invisible.

More recently, discussion of worksite wellness programs focused on ACA provisions designed to increase emphasis on health promotion and disease prevention and to encourage implementation of such programs by employers (Horwitz, 2012). Responding to criticism of provisions of the law that provide incentives for healthy behavior, Goetzel concluded:

> Rather than succumb to the notion that health care costs will continue to rise no matter what, many employers are now offering their workers attractive, effective, and evidence-based workplace health promotion programs designed to improve health and well-being. The evidence shows that properly designed programs aid employees in efforts to quit smoking, lose weight, become physically active, eat healthier, lower blood pressure, manage stress, and manage blood glucose. Smart and fair incentive programs need to be included in the tool kit of interventions available to organizations (Goetzel, 2013).

Trust for America's Health observes that: "Investing in disease prevention is the most effective, common-sense way to improve health. It can help spare millions of Americans from developing preventable illnesses, reduce health care costs, and improve the productivity of the American workforce, so we can be competitive with the rest of the world" (Trust for America's Health, 2011).

Targeted investment of time and effort is sometimes needed rather than a major commitment of funds. One example of such community-level action is in reference to the Task Force recommendation on smoke-free policies discussed in Section 2.1.[3] Identified barriers to implementation of these policies were pre-emptive state legislation, policy exemptions and loopholes, and direct political opposition. Overcoming barriers of these kinds requires public policy activities, establishing "comprehensive state and local smoke-free policies that protect workers and the public in all indoor worksites, remove pre-emption, and limit or eliminate loopholes and exemptions". Additional regulatory steps such as smoke-free policies for multi-unit housing are similar in character. While costs are incurred to bring about these changes, the public health impact is gained by legislative and regulatory action, rather than provision of costly services.

Many provisions of the ACA are consistent with the view that increased investment in prevention, particularly in upstream strategies, is needed and fully justified to address the nation's burden of preventable chronic diseases.[4] Yet persistent calls to repeal the law, or more narrowly to eliminate or divert the Prevention and Public Health Fund, reflect strongly divergent views among legislators regarding this need.

3 For more information, visit: www.thecommnityguide.org/tobacco/RRsmokefreepolicies.htm
4 See Section 2.2

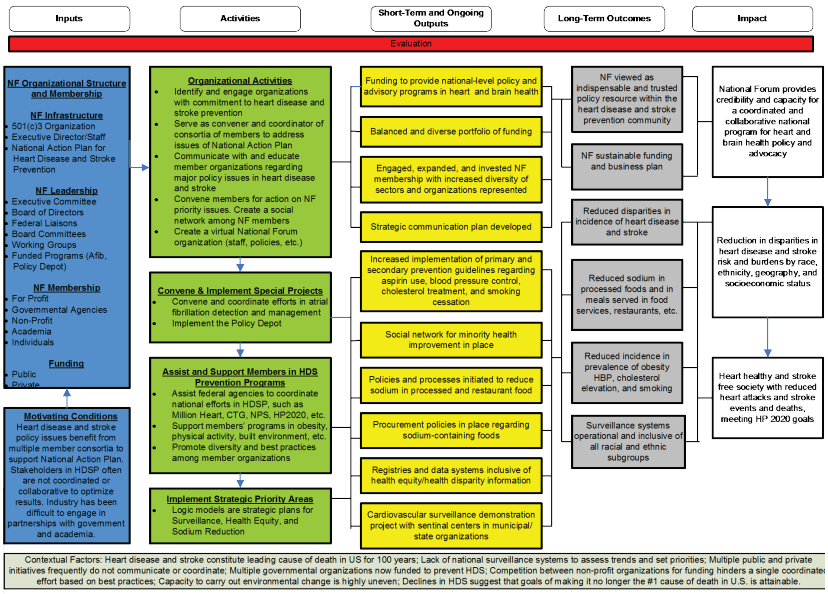
What will it cost in terms of upstream investment in prevention to bring down the burden (and costs) of heart disease and stroke – with the other related NCDs – in the United States? And how quickly can that investment be made? Will "sin taxes" be adopted to increase available resources? These further questions warrant increased attention, and the answers require more extensive public discourse than has yet been achieved.

5.2: Assessing Progress

The 2003 *Action Plan* concluded with a commitment to evaluate progress through a plan that would include: 1) a comprehensive logic model; 2) short-, mid-, and long-term evaluation criteria; 3) key indicators and data systems; 4) procedures for evaluation, as well as for reporting and updating key assumptions and projections; and 5) responsibility and authority for revising the plan. The National Forum Logic Model responds to this need, including evaluation criteria (Figure 5.1).

Indicators and data systems are represented today by the *Healthy People 2020* objectives, both developmental and adopted, and the AHA cardiovascular health metrics. Procedures for evaluation and reporting are reflected in the 5-yearly updates to the *Action Plan*. The National Forum has, with agreement from CDC's Division for Heart Disease and Stroke Prevention, assumed accountability for revising the *Action Plan*.

Figure 5.1: National Forum for Heart Disease and Stroke Prevention Logic Model (National Forum, 2012)



(Source: National Forum for Heart Disease and Stroke Prevention)

5.3: Celebrating Success

As progress over the past decade suggests, evaluation of the impact of policies and programs for heart disease and stroke prevention can be expected to continue bearing fruit in the decade ahead, and to 2030 and beyond. Against projections of continuing growth in the burden, disparities, and

costs attributable to CVD, a rival forecast is plausible: As progress is demonstrated, and the stories of success are told, effective programs will increasingly be brought to scale.

It is hoped and expected that with this Update the *Action Plan* will make a vital contribution to heart disease and stroke prevention not only in the United States but on regional and global levels as well.

With a promising agenda of priority actions at hand, we can anticipate moving forward toward our vision of the future – that of a heart-healthy and stroke-free world.

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National Forum Member Organizations

Organizational members as of February 2014:

Academy of Nutrition and Dietetics

Alliance for Aging Research

American Association of Cardiovascular and Pulmonary Rehabilitation

American College of Cardiology

American College of Occupational and Environmental Medicine

American College of Preventive Medicine

American Heart Association

American Medical Group Foundation

American Public Health Association

American Sleep Apnea Association

American Society for Preventative Cardiology

American Society of Hypertension

American Stroke Association

Association of Black Cardiologists

Association of State and Territorial Health Officials

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FH Foundation

Health Power for Minorities

Health Resources and Services Administration

Heart Rhythm Society

Heartfile

ICF International

Indian Health Service

Indiana University Health, Inc.

InterAmerican Heart Foundation

Medicine and Public Health Initiative

Mended Hearts

National Association of Chronic Disease Directors

National Association of County and City Health Officials

National Business Group on Health

National Center for Health Statistics

National Conference of State Legislatures

National Governors Association

National Heart, Lung, and Blood Institute

National Human Genome Institute

National Institute for Medical Research (Tanzania)

National Institute of Neurological Disorders and Stroke

National Latina Health Network

National Lipid Association

National Stroke Association

New York City Department of Health

Novartis

Pan American Health Organization

Partnership for Prevention

Preventive Cardiovascular Nurses Association

Preventive Health Partnership

ProCor

Public Health Agency of Canada

Public Health Law Center

RTI International

Sanofi U.S.

Society for Cardiovascular Angiography and Interventions

Society of Cardiovascular Patient Care

Society of Chest Pain Centers

StopAfib.org / American Foundation for Women's Health

Sudden Cardiac Arrest Association

U.S. Department of Health and Human Services

U.S. Department of Veterans Affairs, Ischemic Heart Disease Quality Enhancement Research Initiative

U.S. Food and Drug Administration, Office of Women's Health

U.S. Public Health Service, Region V

University of Michigan Center for Value-Based Insurance Design

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List of Abbreviations

Affordable Care Act	ACA
American College of Cardiology	ACC
American Heart Association	AHA
American Stroke Association	ASA
Body mass index	BMI
Cardiovascular disease	CVD
Center for Medicare and Medicaid	CMS
Centers for Disease Control and Prevention	CDC
Community Transformation Grant	CTG
Coronary heart disease	CHD
Country-wide Integrated Non-communicable Diseases Intervention	CINDI
Chronic kidney disease	CKD
Department of Health and Human Services	HHS
Electronic health record	EHR
End-stage renal disease	ESRD
Mobile health	m-Health
National Health and Nutrition Examination Survey	NHANES
Non-communicable disease	NCD
Pan American Health Organization	PAHO
United Nations General Assembly	UNGA
United States Preventive Services Task Force	Task Force
World Health Organization	WHO

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Table 1: Males and CVD: At-A-Glance (Go et al., 2013)

Diseases and Risk Factors	Both Sexes	Total Males	White Males	Black Males	Mexican American Males
Smoking					
Prevalence, 2011*	43.8 M (19.0%)	24.1 M (21.3%)	22.8%	23.3%	16.2%†
PA‡					
Prevalence, 2011*	21.0%	24.9%	26.2%	25.9%	19.0%†
Overweight and obesity					
Prevalence, 2010					
Overweight and obesity, BMI >25.0 kg/m^2§	154.7 M (68.2%)	79.9 M (72.9%)	73.1%	68.7%	81.3%
Obesity, BMI >30.0 kg/m^2§	78.4 M (34.6%)	36.8 M (33.6%)	33.8%	37.9%	36.0%
Blood cholesterol					
Prevalence, 2010					
Total cholesterol >200 mg/dL§	98.9 M (43.4%)	45.3 M (41.3%)	40.5%	38.6%	48.1%
Total cholesterol >240 mg/dL§	31.9 M (13.8%)	14.0 M (12.7%)	12.3%	10.8%	15.2%
LDL cholesterol >130 mg/dL§	71.0 M (31.1%)	35.2 M (31.9%)	30.1%	33.1%	39.9%
HDL cholesterol <40 mg/dL§	48.7 M (21.8%)	34.6 M (31.8%)	33.1%	20.3%	34.2%
HBP					
Prevalence, 2010§	77.9 M (33.0%)	37.2 M (33.6%)	33.4%	42.6%	30.1%
Mortality, 2009‖	61 762	27 668	20 286	6574	N/A
DM					
Prevalence, 2010					
Physician-diagnosed DM§	19.7 M (8.3%)	9.6 M (8.7%)	7.7%	13.5%	11.4%
Undiagnosed DM§	8.2 M (3.5%)	5.3 M (4.7%)	4.5%	4.8%	6.6%
Prediabetes§	87.3 M (38.2%)	50.7 M (46.0%)	47.7%	35.7%	47.0%
Incidence, diagnosed DM§	1.9 M	N/A	N/A	N/A	N/A
Mortality, 2009‖	68 705	35 054	28 205	5488	N/A
Total CVD					
Prevalence, 2010§	83.6 M (35.3%)	40.7 M (36.7%)	36.6%	44.4%	33.4%
Mortality, 2009‖	787 931	386 436	329 565	46 334	N/A
Stroke					
Prevalence, 2010§	6.8 M (2.8%)	3.0 M (2.6%)	2.4%	4.3%	2.3%
New and recurrent strokes‖	795.0 K	370.0 K	325.0 K	45.0 K	N/A
Mortality, 2009‖	128 842	52 073	43 190	6962	N/A
CHD					
Prevalence, CHD, 2010§	15.4 M (6.4%)	8.8 M (7.9%)	8.2%	6.8%	6.7%
Prevalence, MI, 2010§	7.6 M (2.9%)	5.0 M (4.2%)	4.4%	3.9%	3.6%
Prevalence, AP, 2010§	7.8 M (3.2%)	3.7 M (3.3%)	3.3%	2.4%	3.4%
New and recurrent CHD¶#	915.0 K	535.0 K	465.0 K	65.0 K	N/A
New and recurrent MI#	715.0 K	410.0 K	N/A	N/A	N/A
Incidence, AP (stable angina)**	500.0 K	320.0 K	N/A	N/A	N/A
Mortality, 2009, CHD‖	386 324	210 069	183 453	21 051	N/A
Mortality, 2009, MI‖	125 464	68 814	60 316	6717	N/A
HF					
Prevalence, 2010§	5.1 M (2.1%)	2.7 M (2.5%)	2.5%	4.1%	1.9%
Mortality, 2009‖	56 410	23 563	20 815	2341	N/A

CVD indicates cardiovascular disease; M, millions; PA, physical activity; LDL, low-density lipoprotein; HDL, high-density lipoprotein; BMI, body mass index; HBP, high blood pressure; N/A, data not available; DM, diabetes mellitus; K, thousands; CHD, coronary heart disease (includes heart attack, angina pectoris chest pain, or both); MI, myocardial infarction (heart attack); AP, angina pectoris (chest pain); and HF, heart failure.

*Age ≥18 years (National Health Interview Survey).

†All Hispanic (National Health Interview Survey).

‡Met 2008 full Federal PA guidelines for adults.

§Age >20 years.

‖All ages.

¶New and recurrent MI and fatal CHD.

#Age ≥35 years.

**Age ≥45 years.

Source: *Circulation*

Table 2: Females and CVD: At-A-Glance (Go et al., 2013)

Diseases and Risk Factors	Both Sexes	Total Females	White Females	Black Females	Mexican American Females
Smoking					
Prevalence, 2011*	43.8 M (19.0%)	19.7 M (16.7%)	19.7%	15.1%	8.3%†
PA‡					
Prevalence, 2011*	21.0%	17.1%	20.0%	11.3%	11.5%†
Overweight and obesity					
Prevalence, 2010					
Overweight and obesity, BMI >25.0 kg/m^2§	154.7 M (68.2%)	74.8 M (63.7%)	60.2%	79.9%	78.2%
Obesity, BMI >30.0 kg/m^2§	78.4 M (34.6%)	41.6 M (35.6%)	32.5%	53.9%	44.8%
Blood cholesterol					
Prevalence, 2010					
Total cholesterol >200 mg/dL§	98.9 M (43.4%)	53.6 M (44.9%)	45.8%	40.7%	44.7%
Total cholesterol >240 mg/dL§	31.9 M (13.8%)	17.9 M (14.7%)	15.6%	11.7%	13.5%
LDL cholesterol >130 mg/dL§	71.0 M (31.1%)	35.8 M (30.0%)	29.3%	31.2%	30.4%
HDL cholesterol <40 mg/dL§	48.7 M (21.8%)	14.1 M (12.3%)	12.4%	10.2%	15.1%
HBP					
Prevalence, 2010§	77.9 M (33.0%)	40.7 M (32.2%)	30.7%	47.0%	28.8%
Mortality, 2009‖	61 762	34 094	26 201	6951	N/A
DM					
Prevalence, 2010					
Physician-diagnosed DM§	19.7 M (8.3%)	10.1 M (7.9%)	6.2%	15.4%	12.0%
Undiagnosed DM§	8.2 M (3.5%)	2.9 M (2.3%)	1.8%	2.9%	4.7%
Prediabetes§	87.3 M (38.2%)	33.6 M (30.5%)	30.0%	29.0%	31.9%
Incidence, diagnosed DM§	1.9 M	N/A	N/A	N/A	N/A
Mortality, 2009‖	68 705	33 651	25 908	6472	N/A
Total CVD					
Prevalence, 2010§	83.6 M (35.3%)	42.9 M (34.0%)	32.4%	48.9%	30.7%
Mortality, 2009‖	787 931	401 495	343 955	48 070	N/A
Stroke					
Prevalence, 2010§	6.8 M (2.8%)	3.8 M (3.0%)	2.9%	4.7%	1.4%
New and recurrent strokes‖	795.0 K	425.0 K	365.0 K	60.0 K	N/A
Mortality, 2009‖	128 842	76 769	65 574	8916	N/A
CHD					
Prevalence, CHD, 2010§	15.4 M (6.4%)	6.6 M (5.1%)	4.6%	7.1%	5.3%
Prevalence, MI, 2010§	7.6 M (2.9%)	2.6 M (1.7%)	1.5%	2.3%	1.7%
Prevalence, AP, 2010§	7.8 M (3.2%)	4.1 M (3.2%)	2.8%	5.4%	3.3%
New and recurrent CHD¶#	915.0 K	380.0 K	325.0 K	60.0 K	N/A
New and recurrent MI#	715.0 K	305.0 K	N/A	N/A	N/A
Incidence, AP (stable angina)**	500.0 K	180.0 K	N/A	N/A	N/A
Mortality, 2009, CHD‖	386 324	176 255	152 785	19 470	N/A
Mortality, 2009, MI‖	125 464	56 650	48 802	6567	N/A
HF					
Prevalence, 2010§	5.1 M (2.1%)	2.4 M (1.8%)	1.8%	3.0%	1.1%
Mortality, 2009‖	56 410	32 847	29 372	2987	N/A

CVD indicates cardiovascular disease; M, millions; PA, physical activity; LDL, low-density lipoprotein; HDL, high-density lipoprotein; BMI, body mass index; HBP, high blood pressure; N/A, data not available; DM, diabetes mellitus; K, thousands; CHD, coronary heart disease (includes heart attack, angina pectoris chest pain, or both); MI, myocardial infarction (heart attack); AP, angina pectoris (chest pain); and HF, heart failure.

*Age >18 years (National Health Interview Survey).

†All Hispanic (National Health Interview Survey)

‡Met 2008 full Federal PA guidelines for adults.

§Age >20 years.

‖All ages.

¶New and recurrent MI and fatal CHD.

#Age >35 years.

**Age >45 years.

Source: *Circulation*

Table 3: Race/Ethnicity and CVD: At-A-Glance (Go et al., 2013)

Diseases and Risk Factors	Both Sexes	Whites		Blacks		Mexican Americans		Hispanics/ Latinos		Asians: Both Sexes	American Indian/ Alaska Native: Both Sexes
		Males	Females	Males	Females	Males	Females	Males	Females		
Smoking											
Prevalence, 2011*	43.8 M (19.0%)	22.8%	19.7%	23.3%	15.1%	12.3%		16.2%	8.3%	9.6%	26.7%
PA†											
Prevalence, 2011*	21.0%	21.7%		17.8%		15.4%		15.4%		16.7%	17.0%
Overweight and obesity											
Prevalence, 2010											
Overweight and obesity, BMI >25.0 kg/m²‡	154.7 M (68.2%)	73.1%	60.2%	68.7%	79.9%	81.3%	78.2%	N/A	N/A	N/A	N/A
Overweight and obesity, BMI >30.0 kg/m²‡	78.4 M (34.6%)	33.8%	32.5%	37.9%	53.9%	36.0%	44.8%	N/A	N/A	N/A	N/A
Blood cholesterol											
Prevalence, 2010											
Total cholesterol >200 mg/dL‡	98.9 M (43.4%)	40.5%	45.8%	38.6%	40.7%	48.1%	44.7%	N/A	N/A	N/A	N/A
Total cholesterol >240 mg/dL‡	31.9 M (13.8%)	12.3%	15.6%	10.8%	11.7%	15.2%	13.5%	N/A	N/A	N/A	N/A
LDL cholesterol >130 mg/dL‡	71.0 M (31.1%)	30.1%	29.3%	33.1%	31.2%	39.9%	30.4%	N/A	N/A	N/A	N/A
HDL cholesterol <40 mg/dL‡	48.7 M (21.8%)	33.1%	12.4%	20.3%	10.2%	34.2%	15.1%	N/A	N/A	N/A	N/A
HBP											
Prevalence, 2010‡	77.9 M (33.0%)	33.4%	30.7%	42.6%	47.0%	30.1%	28.8%	22.2%*		18.7*	25.8%*
Mortality, 2009§	61 762	20 286	26 201	6574	6951	N/A	N/A	N/A	N/A	N/A	N/A
DM											
Prevalence, 2010											
Physician-diagnosed DM‡	19.7 M (8.3%)	7.7%	6.2%	13.5%	15.4%	11.4%	12.0%	N/A	N/A	N/A	N/A
Undiagnosed DM‡	8.2 M (3.5%)	4.5%	1.8%	4.8%	2.9%	6.6%	4.7%	N/A	N/A	N/A	N/A
Prediabetes‡	87.3 M (38.2%)	47.7%	30.0%	35.7%	29.0%	47.0%	31.9%	N/A	N/A	N/A	N/A
Incidence, diagnosed DM‡	1.9 M	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mortality, 2009§	68 705	28 205	25 908	5488	6472	N/A	N/A	N/A	N/A	N/A	N/A
Total CVD											
Prevalence, 2010‡	83.6 M (35.3%)	36.6%	32.4%	44.4%	48.9%	33.4%	30.7%	N/A	N/A	N/A	N/A
Mortality, 2009§	787 931	329 565	343 955	46 334	48 070	N/A	N/A	N/A	N/A	N/A	N/A
Stroke											
Prevalence, 2010‡	6.8 M (2.8%)	2.4%	2.9%	4.3%	4.7%	2.3%	1.4%	2.8%*		2.7%*	4.6%‖
New and recurrent strokes§	795.0 K	325.0 K	365.0 K	45.0 K	60.0 K	N/A	N/A	N/A	N/A	N/A	N/A
Mortality, 2009§	128 842	43 190	65 574	6962	8916	N/A	N/A	N/A	N/A	N/A	N/A
CHD											
Prevalence, CHD, 2010‡	15.4 M (6.4%)	8.2%	4.6%	6.8%	7.1%	6.7%	5.3%	N/A	N/A	N/A	N/A
Prevalence, MI, 2010‡	7.6 M (2.9%)	4.4%	1.5%	3.9%	2.3%	3.6%	1.7%	N/A	N/A	N/A	N/A
Prevalence, AP, 2010‡	7.8 M (3.2%)	3.3%	2.8%	2.4%	5.4%	3.4%	3.3%	N/A	N/A	N/A	N/A
New and recurrent CHD¶#	915.0 K	465.0 K	325.0 K	65.0 K	60.0 K	N/A	N/A	N/A	N/A	N/A	N/A
Mortality, CHD, 2009§	386 324	183 453	152 785	21 051	19 470	N/A	N/A	N/A	N/A	N/A	N/A
Mortality, MI, 2009§	125 464	60 316	48 802	6717	6567	N/A	N/A	N/A	N/A	N/A	N/A
HF											
Prevalence, 2010‡	5.1 M (2.1%)	2.5%	1.8%	4.1%	3.0%	1.9%	1.1%	N/A	N/A	N/A	N/A
Mortality, 2009§	56 410	20 815	29 372	2341	2987	N/A	N/A	N/A	N/A	N/A	N/A

CVD indicates cardiovascular disease; M, millions; PA, physical activity; N/A, data not available; LDL, low-density lipoprotein; HDL, high-density lipoprotein; BMI, body mass index; HBP, high blood pressure; DM, diabetes mellitus; K, thousands; CHD, coronary heart disease (includes heart attack, angina pectoris chest pain, or both); MI, myocardial infarction (heart attack); AP, angina pectoris (chest pain); and HF, heart failure.

*Age >18 years (National Health Interview Survey).

†Met 2008 full Federal PA guidelines for adults.

‡Age >20 years.

§All ages.

‖Figure not considered reliable.

¶New and recurrent MI and fatal CHD.

#Age >35 years.

Source: *Circulation*

Table 4: Children, Youth, and CVD: At-A-Glance (Go et al., 2013)

Diseases and Risk Factors	Both Sexes	Total Males	Total Females	NH Whites		NH Blacks		Mexican Americans	
				Males	Females	Males	Females	Males	Females
Smoking, %									
High school students, grades 9–12									
Current cigarette smoking, 2011	18.1	19.9	16.1	21.5	18.9	13.7	7.4	19.5*	15.2*
Current cigar smoking, 2011	13.1	17.8	8.0	19.0	7.5	15.1	8.5	17.2*	9.1*
PA†									
Prevalence, grades 9–12, 2011‡									
Met currently recommended levels of PA, %	49.5	59.9	38.5	62.1	42.6	57.1	31.9	57.1*	33.0*
Overweight and obesity									
Prevalence, 2010									
Children and adolescents, ages 2–19 y, overweight or obese	23.9 M (31.8%)	12.7 M (33.0%)	11.2 M (30.4%)	30.1%	25.6%	36.9%	41.3%	40.5%	38.2%
Children and adolescents, age 2–19 y, obese‡	12.7 M (16.9%)	7.2 M (18.6%)	5.5 M (15.0%)	16.1%	11.7%	24.3%	24.3%	24.0%	18.2%
Blood cholesterol, mg/dL, 2010									
Mean total cholesterol									
Ages 4–11 y	161.9	162.3	161.5	160.9	161.6	165.2	157.9	159.6	160.7
Ages 12–19 y	158.2	156.1	160.3	156.8	161.1	154.1	160.6	157.8	158.0
Mean HDL cholesterol									
Ages 4–11 y	53.6	55.1	51.9	53.9	51.4	59.9	55.3	53.5	50.5
Ages 12–19 y	51.4	49.2	53.6	48.4	53.0	53.9	55.4	47.5	53.3
Mean LDL cholesterol									
Ages 12–19 y	89.5	88.6	90.5	90.4	90.9	85.8	91.8	90.6	87.1
Congenital cardiovascular defects									
Mortality, 2009§	3189	1754	1435	1370	1086	304	268	N/A	N/A

CVD indicates cardiovascular disease; NH, non-Hispanic; PA, physical activity; HDL, high-density lipoprotein; LDL, low-density lipoprotein; M, millions; and N/A, data not available. Overweight indicates a body mass index in the 95th percentile of the Centers for Disease Control and Prevention 2000 growth chart.

*Hispanic.

†Regular leisure-time PA.

‡Eaton DK, Kann L, Kinchen S, Shanklin S, Flint KH, Hawkins J, Harris WA, Lowry R, McManus T, Chyen D, Whittle L, Lim C, Wechsler H; Centers for Disease Control and Prevention. Youth risk behavior surveillance: United States, 2011. *MMWR Surveill Summ.* 2012;61:1–162.

§All ages.

Source: *Circulation*

Table 5: Progress Toward Target Attainment for Focus Area 12: Heart Disease and Stroke (NCHS, 2010)

LEGEND — Moved away from target[1] | Moved toward target | Met or exceeded target

Objective	Percent of targeted change achieved[2] (0 25 50 75 100)	2010 Target	Baseline (Year)	Final (Year)	Baseline vs. Final: Difference[3]	Baseline vs. Final: Statistically Significant[4]	Baseline vs. Final: Percent Change[5]
12-1. Coronary heart disease (CHD) deaths (age adjusted, per 100,000 population)	176.9%	156	195 (1999)	126 (2007)	-69	Yes	-35.4%
12-2. Knowledge of heart attack symptoms and importance of calling 911 (age adjusted, 20+ years)		47%	42% (2001)	37% (2008)	-5	Yes	-11.9%
12-4. Training in cardiopulmonary resuscitation (CPR) in past year (age adjusted, 20+ years)	50.0%	12%	8% (2001)	10% (2008)	2	Yes	25.0%
12-6. Congestive heart failure hospitalizations (per 1,000 population)							
a. 65–74 years	70.1%	6.5	13.2 (1997)	8.5 (2007)	-4.7	Yes	-35.6%
b. 75–84 years	53.0%	13.5	26.7 (1997)	19.7 (2007)	-7.0	Yes	-26.2%
c. 85+ years	75.6%	26.5	52.7 (1997)	32.9 (2007)	-19.8	Yes	-37.6%
12-7. Stroke deaths (age adjusted, per 100,000 population)	166.7%	50	62 (1999)	42 (2007)	-20	Yes	-32.3%
12-8. Knowledge of stroke symptoms (age adjusted, 20+ years)		65%	60% (2001)	54% (2009)	-6	Yes	-10.0%
12-9. High blood pressure (age adjusted, 18+ years)		14%	25% (1988–94)	30% (2005–08)	5	Yes	20.0%
12-10. High blood pressure control (age adjusted, 18+ years)	44.2%	68%	25% (1988–94)	44% (2005–08)	19	Yes	76.0%
12-11. Taking action to help control blood pressure (age adjusted, 18+ years)	50.0%	98%	84% (1998)	91% (2008)	7	Yes	8.3%
12-12. Adults who had their blood pressure measured in past 2 years and know their blood pressure level (age adjusted, 18+ years)	20.0%	95%	90% (1998)	91% (2008)	1	Yes	1.1%
12-13. Mean total blood cholesterol levels (mg/dL, age adjusted, 20+ years)	114.3%	199	206 (1988–94)	198 (2005–08)	-8	Yes	-3.9%
12-14. High blood cholesterol levels (age adjusted, 20+ years)	150.0%	17%	21% (1988–94)	15% (2005–08)	-6	Yes	-28.6%
12-15. Blood cholesterol screening in past 5 years (age adjusted, 18+ years)	61.5%	80%	67% (1998)	75% (2008)	8	Yes	11.9%

Table 5 (Continued)

NOTES

See the Reader's Guide for more information on how to read this figure. See DATA2010 at http://wonder.cdc.gov/data2010 for all HealthyPeople 2010 tracking data. Tracking data are not available for objectives 12-3a, 12-3b, 12-5, and 12-16.

FOOTNOTES

[1] Movement away from target is not quantified using the percent of targeted change achieved. See Technical Appendix for more information.

[2] Percent of targeted change achieved = $\frac{\text{Final value} - \text{Baseline value}}{\text{Healthy People 2010 target} - \text{Baseline value}} \times 100$.

[3] Difference = Final value – Baseline value. Differences between percents (%) are measured in percentage points.

[4] When estimates of variability are available, the statistical significance of the difference between the final value and the baseline value is assessed at the 0.05 level. See Technical Appendix for more information.

[5] Percent change = $\frac{\text{Final value} - \text{Baseline value}}{\text{Baseline value}} \times 100$.

DATA SOURCES

12-1.	National Vital Statistics System—Mortality (NVSS-M), CDC, NCHS.
12-2.	National Health Interview Survey (NHIS), CDC, NCHS.
12-4.	National Health Interview Survey (NHIS), CDC, NCHS.
12-6a–c.	National Hospital Discharge Survey (NHDS), CDC, NCHS.
12-7.	National Vital Statistics System—Mortality (NVSS-M), CDC, NCHS.
12-8.	National Health Interview Survey (NHIS), CDC, NCHS.
12-9–12-10.	National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.
12-11–12-12.	National Health Interview Survey (NHIS), CDC, NCHS.
12-13–12-14.	National Health and Nutrition Examination Survey (NHANES), CDC, NCHS.
12-15.	National Health Interview Survey (NHIS), CDC, NCHS.

Source: *Healthy People 2010 Final Review*

Table 6: Health Disparities Table for Focus Area 12: Heart Disease and Stroke (NCHS, 2010)

Disparities from the best group rate for each characteristic at the most recent data point and changes in disparity from the baseline to the most recent data point.

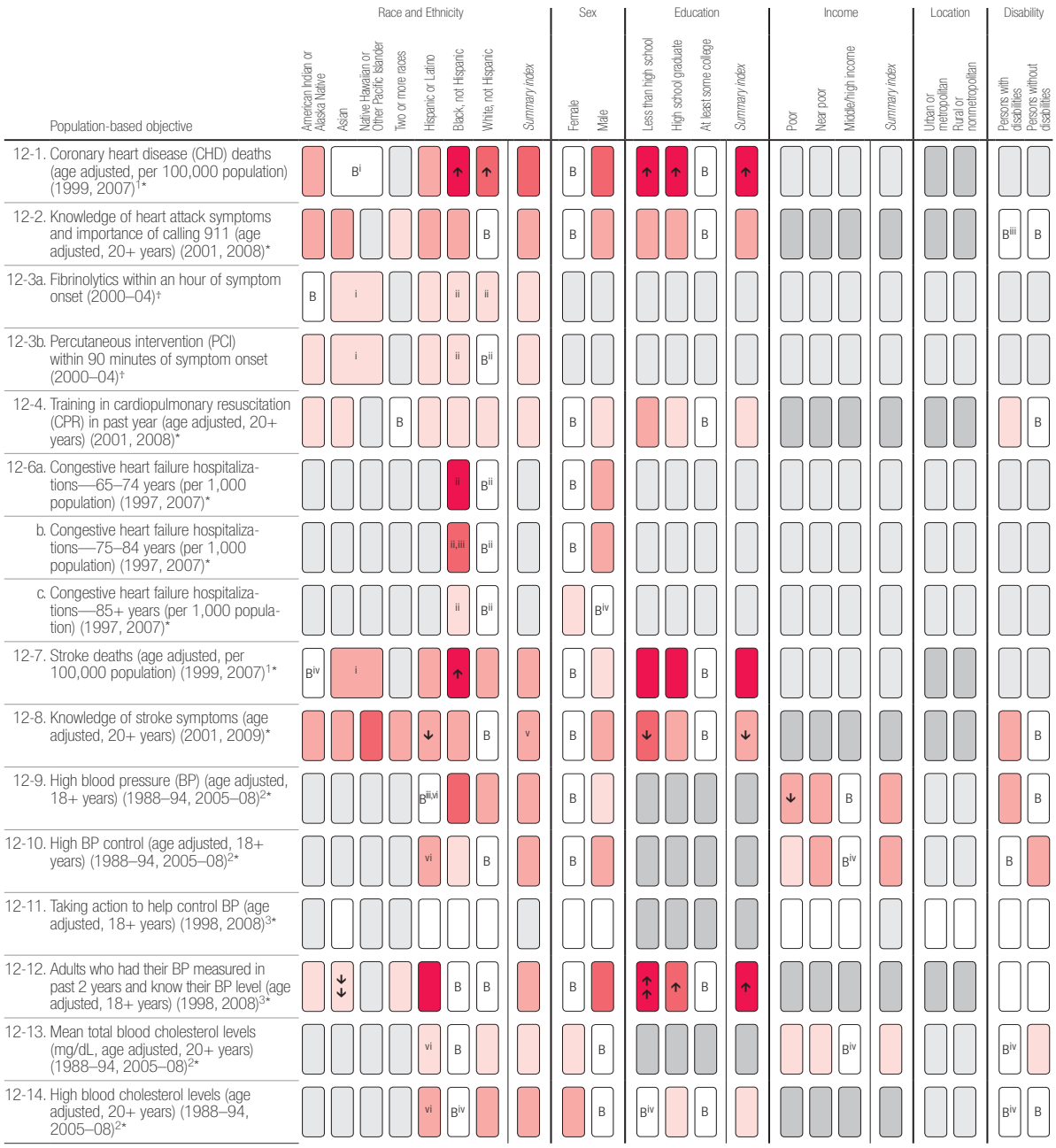
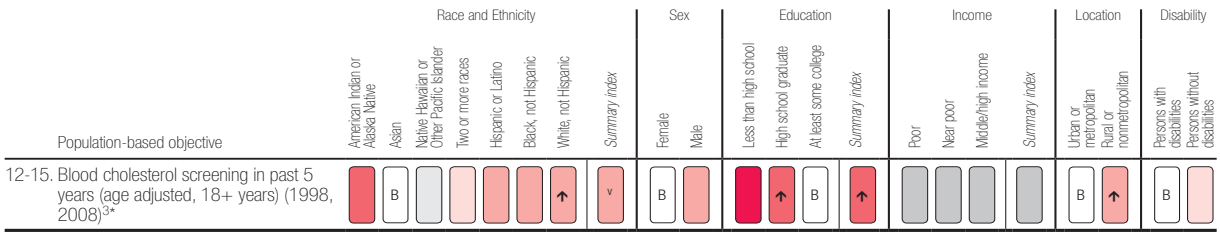


Table 6 (Continued)



NOTES

See DATA2010 at http://wonder.cdc.gov/data2010 for all Healthy People 2010 tracking data. Disparity data are either unavailable or not applicable for objectives 12-5 and 12-16.

Years in parentheses represent the baseline and most recent data years (if available).

Disparity from the best group rate is defined as the percent difference between the best group rate and each of the other group rates for a characteristic (e.g., race and ethnicity). The summary index is the average of these percent differences for a characteristic. Change in disparity is estimated by subtracting the disparity at baseline from the disparity at the most recent data point. Change in the summary index is estimated by subtracting the summary index at baseline from the summary index at the most recent data point. See Technical Appendix for more information.

LEGEND

The "best" group rate at the most recent data point.

- B — The group with the best rate for specified characteristic.
- b — Most favorable group rate for specified characteristic, but reliability criterion not met.
- Reliability criterion for best group rate not met, or data available for only one group.

Disparity from the best group rate at the most recent data point.

Percent difference from the best group rate

- Less than 10%, or difference not statistically significant (when estimates of variability are available).
- 10%–49%
- 50%–99%
- 100% or more

Changes in disparity over time are shown when: (a) disparities data are available at both baseline and most recent time points; (b) data are not for the group(s) indicated by "B" or "b" at either time point; and (c) the change is greater than or equal to 10 percentage points and statistically significant, or when the change is greater than or equal to 10 percentage points and estimates of variability were not available. See Technical Appendix.

Increase in disparity (percentage points)

- ↑ 10–49 points
- ↑↑ 50–99 points
- ↑↑↑ 100 points or more

Decrease in disparity (percentage points)

- ↓ 10–49 points
- ↓↓ 50–99 points
- ↓↓↓ 100 points or more

Availability of Data

- Data not available.
- Characteristic not selected for this objective.

FOOTNOTES

* Measures of variability were available. Thus, the variability of best group rates was assessed, and statistical significance was tested. Disparities of 10% or more are displayed when the differences from the best group rate are statistically significant at the 0.05 level. Changes in disparities over time are indicated by arrows when the changes are greater than or equal to 10 percentage points and are statistically significant at the 0.05 level. See Technical Appendix.

† Measures of variability were not available. Thus, the variability of best group rates was not assessed, and statistical significance could not be tested. Nonetheless, disparities and changes in disparities over time are displayed according to their magnitude. See Technical Appendix.

[1] Most recent data by education level are for 2002.

[2] Baseline data by disability status are for 1991–94.

[3] Baseline data by race and ethnicity are for 2003.

[i] Data are for Asian or Pacific Islander.

[ii] Data include persons of Hispanic origin.

[iii] Reliability criterion for best group rate not met, or data available for only one group, at baseline. Change in disparity cannot be assessed. See Technical Appendix.

Source: *Healthy People 2010 Final Review*

Table 7: Fundamental Requirements and Recommendations for Public Health Action to Prevent Heart Disease and Stroke – 2003 *Action Plan* and 2008 Update (HHS, 2003; National Forum, 2008b)

Effective Communication

The urgency and promise of preventing heart disease and stroke and their precursors (i.e., atherosclerosis, high blood pressure, and their risk factors and determinants) must be communicated effectively by the public health community through a new long-term strategy of public information and education. This new strategy must engage national, state, and local policy makers and other stakeholders.

Strategic Leadership, Partnerships, and Organization

The nation's public health agencies and their partners must provide the necessary leadership for a comprehensive public health strategy to prevent heart disease and stroke.

Recommendations

Taking Action: Putting Present Knowledge to Work

1. Initiate policy development in CVH promotion and CVD prevention at national, state, and local levels to assure effective public health action against heart disease and stroke. In addition, evaluate policies in non-health sectors (e.g., education, agriculture, transportation, community planning) for their potential impact on health, especially with respect to CVD.

2. Act now to implement the most promising public health programs and practices for achieving the four goals for preventing heart disease and stroke, as distinguished by the Healthy People 2010 Heart and Stroke Partnership based on the different intervention approaches that apply. These goals are prevention of risk factors, detection and treatment of risk factors, early identification and treatment of heart attacks and strokes, and prevention of recurrent cardiovascular events. Public health agencies and their partners must provide continuous leadership to identify and recommend new and effective interventions that are based on advances in program evaluation and prevention research and a growing inventory of "best practices."

3. Address all opportunities for prevention to achieve the full potential of preventive strategies. Such opportunities include major settings (schools, work sites, health care settings, communities, and families), all age groups (from conception through the life span), and whole populations, particularly priority populations (based on race/ethnicity, sex, disability, economic condition, or place of residence).

4. Emphasize promotion of desirable social and environmental conditions and favorable behavioral patterns in order to prevent the major CVD risk factors and assure the fullest attainable accessibility and use of quality health services for people with risk factors or who develop sub-clinical or overt CVD. These actions are integral to a comprehensive public health strategy for CVH promotion and CVD prevention.

Table 7 (Continued)

Strengthening Capacity: Transforming the Organization and Structure of Public Health Agencies and Partnerships

5. Maintain or establish definable entities with responsibility and accountability for CVH programs within federal, state, and local public health agencies, including laboratory components.

6. Create a training system to develop and maintain appropriately trained public health workforces at national, state, and local levels. These workforces should have all necessary competencies to bring about policy change and implement programs to improve CVH promotion and decrease the CVD burden, including laboratory requirements.

7. Develop and disseminate model performance standards and core competencies in CVD prevention and CVH promotion for national, state, and local public health agencies, including their laboratories.

8. Provide ongoing access to technical assistance and consultation to state and local health agencies and partners for CVD prevention. NEW in 2008: (a) Public health agencies, through their HDSP units, should be accountable for fulfilling their assurance function regarding quality of care in heart disease and stroke prevention and should be supported in this role through periodic conference calls, training opportunities, and other appropriate means. (b) Public health agencies should call for, and to the fullest extent possible conduct, both research and program evaluation relevant to public health practice and should maintain currency of knowledge in order to apply and disseminate it effectively.

Evaluating Impact: Monitoring the Burden, Measuring Progress, and Communicating Urgency

9. Expand and standardize population-wide evaluation and surveillance data sources and activities to assure adequate assessment of CVD indicators and change in the nation's CVD burden. Examples include mortality, incidence, prevalence, disability, selected biomarkers, risk factors and risk behaviors, economic burden, community and environmental characteristics, current policies and programs, and sociodemographic factors (e.g., age, race/ethnicity, sex, and ZIP code).

10. Establish a network of data systems for evaluation of policy and program interventions that can track the progress of evolving best practices and signal the need for changes in policies and programs over time. This network would support the full development, collection, and analysis of the data needed to examine program effectiveness.

11. Develop the public health infrastructure, build personnel competencies, and enhance communication systems so that federal, state, and local public health agencies can communicate surveillance and evaluation results in a timely and effective manner.

Table 7 (Continued)

Advancing Policy: Defining the Issues and Finding the Needed Solutions

12. Conduct and facilitate research by means of collaboration among interested parties to identify new policy, environmental, and sociocultural priorities for CVH promotion. Once the priorities are identified, determine the best methods for translating, disseminating, and sustaining them. Fund research to identify barriers and effective interventions in order to translate science into practice and thereby improve access to and use of quality health care and improve outcomes for patients with or at risk for CVD. Conduct economics research, including cost-effectiveness studies and comprehensive economic models that assess the return on investment for CVH promotion as well as primary and secondary CVD prevention.

13. Design, plan, implement, and evaluate a comprehensive intervention for children and youth in school, family, and community settings. This intervention must address dietary imbalances, physical inactivity, tobacco use, and other determinants in order to prevent development of risk factors and progression of atherosclerosis and high blood pressure.

14. Conduct and facilitate research on improvements in surveillance methods and data collection and management methods for policy development, environmental change, performance monitoring, identification of key indicators, and capacity development. Address population subgroups in various settings (schools, work sites, health care, communities) at local, state, and national levels. Additionally, assess the impact of new technologies and regulations on surveillance systems and the potential benefit of alternative methods.

15. Conduct and support research to determine the most effective marketing messages and educational campaigns to create demand for heart-healthy options, change behavior, and prevent heart disease and stroke for specific target groups and settings. Create and evaluate economically viable CVD prevention ventures (e.g., in food production, manufacturing, marketing).

16. Initiate and strengthen training grants and other approaches, such as training workshops and supervised research opportunities, to build the competencies needed to implement the CVD prevention research agenda.

Engaging in Regional and Global Partnerships: Multiplying Resources and Capitalizing on Shared Experience

17. Engage with regional and global partners to mobilize resources in CVH promotion and CVD prevention, develop and implement global CVH policies, and establish or strengthen liaison with the partners identified in these recommendations.

18. Address inequalities in CVH among developed and developing countries, rich and poor

Table 7 (Continued)

people within countries, and men and women of all ages. Work with national and global partners to assess the impact of globalization and trade policies on global CVH.

19. Develop a strategy to promote use of the media to support CVH globally.

20. Strengthen global capacity to develop, implement, and evaluate policy and program interventions to prevent and control heart disease and stroke. Involve all relevant parties—governmental and nongovernmental, public and private, and traditional and nontraditional partners—in a systematic and strategic approach.

21. Strengthen the global focus of public health agencies in the United States and their partners on CVH and increase their participation in partnerships intended to a) develop and implement standards for adequate monitoring of health, social, and economic indicators and b) develop the ability to effectively disseminate and translate information into policy and action.

22. Promote and support research on implementing and evaluating CVH policy interventions in diverse settings where different social and economic development and health transition experiences offer contrasting conditions for testing new intervention approaches.

(Source: HHS; National Forum)

Table 8: Systematic Reviews/Evidence Summaries with Recommendations for Optimal Behaviors at the Community Level (Pearson et al., 2013)

Optimal Behaviors	Review/Summary	Recommendation
No tobacco		
Reduce tobacco use	Surgeons General reports[104] USPSTF[31]	Complete cessation for individuals
	IOM report on tobacco[105]	Reductions in prevalence of smoking to level where public health impact is minimal
Reduce exposure to environmental tobacco smoke	Surgeon General Reports[55] IOM report on tobacco[105]	Curtail all sources of involuntary exposure to environmental tobacco smoke
Healthy dietary practices		
Calories	AHA 2020 Impact Goals[4] AHA diet and lifestyle recommendations[106] AHA obesity guidelines[107] 2010 US dietary guidelines[108]	Women: 1600–2400 cal/d Men: 2000–3000 cal/d Calorie ranges depend on age and physical activity level. Balance calorie intake and physical activity to achieve or maintain a healthy body weight. Healthy body weight for adults: BMI <25 kg/m^2
	NHLBI integrated guidelines for children and adolescents[19]	Healthy body weight for youths (2–18 y of age): BMI <85th percentile based on CDC 2000 growth charts
Vegetable and fruit intake	AHA 2020 Impact Goals[4] AHA diet and lifestyle recommendations[106] 2010 US dietary guidelines[108]	At least 4.5 cups/d
Whole grains (eg, whole-wheat bread, brown rice)	AHA 2020 Impact Goals[4] Harris and Kris-Etherton, 2010[57] 2010 US dietary guidelines[108]	At least three 1-oz-equivalent servings /d (1.1 g fiber per 10 g carbohydrate)
Fish intake (eg, wild salmon, anchovies)	AHA 2020 Impact Goals[4] AHA diet and lifestyle recommendations[106] 2010 US dietary guidelines[108] Mozafarrian and Rimm, 2006[58]	At least two 3.5-oz servings/week (low mercury)
SFA, TFA, and cholesterol	AHA 2020 Impact Goals[4] ATP III[59] AHA diet and lifestyle recommendations[106] 2010 US dietary guidelines[108]	SFA <7% of calories, TFA as low as possible, dietary cholesterol <300 mg/d
Sugar	AHA 2020 Impact Goals[4] Johnson et al, 2009[61]	<150 cal/d (men), <100 cal/d (women)
	AHA 2020 Impact Goals[4]	<450 kcal (36 oz)/wk (sugar-sweetened beverages such as soda and juice)
Sodium	AHA 2020 Impact Goals[4] AHA sodium statement[62] IOM report on sodium intake[109]	<1500 mg/d sodium
Physically active lifestyle		
	2008 US physical activity guidelines[63] AHA/ACSM recommendations[67] *The Guide to Community Preventive Services*[110]	Adults (≥18 y of age): 150 min of moderate aerobic activity per week or 75 min of vigorous physical activity per week
	2008 US physical activity guidelines[63]	Children and youth (6–18 y of age): 60 min of moderate to vigorous aerobic activity daily, with at least 3 of the 7 days each week including vigorous physical activity
	2008 US physical activity guidelines[63] AHA/ACSM recommendations[67] *The Guide to Community Preventive Services*[110]	Both adults and children/youth: aerobic activity should be performed in bouts of at least 10 min
	2008 US physical activity guidelines[63] AHA/ACSM recommendations[67] *The Guide to Community Preventive Services*[110]	Minimum of 2 d/wk of resistance exercise to maintain and improve muscle strength and endurance, complemented by stretching/flexibility exercises
	2008 US physical activity guidelines[63] AHA/ACSM recommendations[67] *The Guide to Community Preventive Services*[110]	Supplement structured exercise with an increase in daily lifestyle activities (eg, walking, active commuting, parking farther away from stores, doing household chores, using stairs rather than elevators or escalators)
Adherence with healthcare recommendations (eg, hypertension, hyperlipidemia, diabetes mellitus)		
Screening and diagnosis of risk factors	ATP III[59] JNC 7[71] ADA[111] NHLBI overweight and obesity guide[112] Lloyd-Jones et al, 2004[113]	Total cholesterol <200 mg/dL BP <120/80 mm Hg Fasting blood glucose <100 mg/dL BMI <25 kg/m^2 No family history of premature CVD

(*Continued*)

Table 8 (Continued)

Table 2. Continued

Optimal Behaviors	Review/Summary	Recommendation
Healthcare recommendations to favorably modify behaviors and risk factors	ATP III[59]	Routine cholesterol testing should begin in young adulthood (≥20 y of age)
	NHLBI integrated guidelines for children and adolescents[19]	Youths (2–8 y of age) should be screened for high cholesterol if they have a family history of premature CVD (≤55 y of age) or a parent history of hypercholesterolemia
		Universal cholesterol screening is recommended for youths 9–11 y of age
	USPSTF for blood pressure[114]	Screen BP every 2 y (<120/80 mm Hg)
	JNC 7[71]	Screen BP every 1 y (systolic, 120–139 mm Hg diastolic, 80–90 mm Hg)
	USPSTF for diabetes mellitus[115]	Screen for type 2 diabetes mellitus in adults with BP >135/80 mm Hg or symptoms
	ADA[111]	Screen for type 2 diabetes mellitus in adults (≥45 y of age) and adults of any age with BMI ≥25 kg/m^2 and at least 1 risk factor for diabetes mellitus
	NHLBI Overweight and Obesity Guide[112]	Screen BMI every 2 y (BMI <25 kg/m^2 and no history of being overweight)
	USPSTF obesity treatment[116,117]	
Delayed recognition and treatment of symptomatic disease		
Presentation for diagnosis and treatment	AHA reducing delay in seeking treatment[74]	Increase knowledge of heart attack and stroke symptoms
	AHA CPR and emergency care[77]	Immediate activation of the EMS system, provision of CPR, and operation of a defibrillator in recognition of symptoms
Emergency out-of-hospital care by first provider	AHA reducing delay in seeking treatment[74]	Treatment for acute coronary syndrome should begin within 1 h of signs/symptom onset
	AHA ischemic stroke guidelines[118]	Thrombolytic therapy for ischemic stroke within 3 h of symptom onset

ACP indicates American College of Physicians; ACSM, American College of Sports Medicine; ADA, American Diabetes Association; AHA, American Heart Association; ATP III, Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults; BMI, body mass index; BP, blood pressure; CDC, Centers for Disease Control and Prevention; CPR, cardiopulmonary resuscitation; CVD, cardiovascular disease; EMS, emergency

(Source: *Circulation*)

Table 9: Guide to Improving Cardiovascular Health at the Community Level: Intervention Goals and Recommended Actions for Public Health Programs (Pearson et al., 2013)

Intervention Goals	Recommended Actions
Surveillance[95,96,119]	
Goal: All communities should have access to data that CVD and stroke are leading causes of death and disability for everyone in their community.	• Determine and make available data on the burden of CVD and stroke morbidity and mortality at the local level (city or county). • Identify groups defined by sex, race/ethnicity, socioeconomic status, or geographic location that are at especially high risk of CVD and stroke within each community. • Assess the levels of major preventable causes of CVD and stroke in the community, including social and environmental factors (eg, safety, air pollution), lifestyle behaviors (eg, unhealthy diet, tobacco use, sedentary lifestyle), and risk factors (hypertension, atrial fibrillation, diabetes mellitus, elevated blood cholesterol, and obesity).
Media and education[3,31,82,68,77,120–126]	
General health education	
Goal: All communities should provide information to its members about the burden, causes, and early symptoms of CVD and stroke. Goal: Communities should provide materials and programs to motivate individuals and teach them skills for changing risk behaviors that will target multiple population subgroups.	• Mass media (television, radio, newspaper) should disseminate results of surveillance about the burden of CVD and stroke in the community. • Mass media, social media, and local media should emphasize the importance of lifestyle behaviors and risk factors on cardiovascular health. • Public education campaigns should make the community aware of clinical guidelines for prevention of CVD and stroke in men and women. • Mass and local media should emphasize the early warning signs of MI and stroke. • Ongoing education programs should provide training of lay community members in CPR. • All citizens should know how to access the emergency medical care system. • A guide to community resources (services and programs) for prevention, diagnosis, and treatment of CVD and stroke should be available to all community members. • Communities should support and publicize research-based programs for CVD and stroke risk reduction that are targeted to key population subgroups, especially disadvantaged groups. • Communities should promote the use of Web-based programs for risk reduction by making access to such programs available in public libraries and schools. • Food advertising directed to youth should be limited to foods that are promoted within health guidelines. • Screen time (including TV and computers) should be limited to 1–2 h/d for youths. Adults should limit screen time outside of work.
School and youth education	
Goal: All schools should have research-based comprehensive and age-appropriate curricula about cardiovascular health and ways to improve health behaviors and to reduce CVD and stroke risk. Goal: All schools should implement age-appropriate curricula on changing dietary, physical activity, and smoking behaviors. Goal: All schools should provide teaching of early warning signs of MI and stroke and appropriate initial steps of emergency care.	• School curricula should include lessons about risk factors for CVD and stroke and the extent of heart disease and stroke in the community. • Research-based curricula about effective methods of changing health behaviors should be implemented. • Students should learn skills needed to achieve regular practice of healthful behaviors, and parents should learn how to support their children's healthful behaviors. • Specific curricular materials for healthy nutrition and physical activity should be offered. • Quality physical education should be required daily in kindergarten through 12th grade, with an increasing emphasis on lifetime sports/activities. Implementation of research-based curricula is recommended. • Meals and other foods provided at schools should provide healthy foods conducive to cardiovascular health, including competitive foods, vending machines, and the elimination of easy access to sugar-sweetened beverages. • Students should know how to activate the emergency medical system. • CPR instruction should be available to students at appropriate ages. • Training in CPR should be a requirement for graduation from secondary schools.
Worksite education	
Goal: All worksites should provide materials and services to motivate and assist employees to adopt and maintain heart-healthy behaviors. Goal: All worksites should provide instruction in early warning signs of MI and stroke and appropriate initial steps of emergency care.	• Worksites should have effective worksite wellness programs available to their employees. • Worksites should promote increased physical activity in the day's work (eg, stair climbing). • Workers should have access to research-based effective materials and services to help them adopt and maintain heart healthy behaviors. • Workers should know how to activate the emergency medical system. • CPR instruction should be available to all workers.
Healthcare facility education	
Goal: All healthcare facilities should make available research-based, effective educational materials and programs about changing and maintaining risk factors/risk behaviors, ways to prevent CVD and stroke, and early warning signs of CVD and stroke.	• Healthcare facilities should have effective worksite wellness programs available to their employees. • Print and other media should be available in healthcare facilities to describe CVD and stroke risk factors and their early warning signs. • Guides for primary and secondary prevention should be made available for all patients. • Educational materials should be modified to accommodate for limited literacy, cultural and language diversity, sex differences, and dissemination flexibility.

(*Continued*)

Table 9 (Continued)

Intervention Goals	Recommended Actions
Community organization and partnering[85–88]	
Goal: All communities will have an action plan for CVD and stroke prevention and control with specific targets and goals. Goal: All communities will provide materials and services for risk behavior and risk factor change that are research based whenever possible.	• Identify organizations and institutions in the community that can provide services and resources in prevention and care of CVD and stroke. • Create opportunities for citizens of all ages to become involved in community activities for CVD and stroke prevention. • Educate community organizations about effective research-based materials and services and make these available.
Ensuring personal health services[74,77]	
Goal: Increase the percentage of people at risk who maintain optimal cardiovascular health as established by national guidelines. Goal: Increase the percentage of patients suffering acute coronary syndromes (eg, MI, cardiac arrhythmias) or cerebrovascular syndromes (eg, stroke, TIA) who receive appropriate acute interventions within the time frame of maximal effectiveness. Goal: Provide training concerning smoking, physical activity, nutrition, and effective behavior change counseling methods in medical schools and appropriate residency programs.	• Modify educational materials to accommodate for limited literacy and culture and language diversity. • Provide tobacco users with telephone support interventions including cessation counseling or assistance in attempting to quit or in maintaining abstinence. • Ensure access to screening, counseling, and referral services for CVD and stroke risk factors for all people. • Provide access to rehabilitation and risk factor control programs for CVD and stroke survivors. • Train emergency first responders in the use of AEDs and provide them with AEDs in accordance with AHA recommended guidelines. • Equip high-public-density locations and high-risk activities and have personnel trained in the use of AEDs, in accordance with AHA recommended guidelines. • Require research-based curricula for the MD and nursing degrees, emphasizing skill-building in behavior change related to smoking, diet, and exercise.
Environmental change[82,100,105,109,110,127–134]	
Goal: Ensure access to healthy foods so that all members of the community can meet national dietary recommendations.	• Grocery stores and food markets should provide selections of fruits, green and yellow vegetables, and fiber-rich grain products at reasonable costs. • Restaurants should increase offerings of and identify dishes that meet nutritional guidelines and provide nutritional labeling. • Schools, childcare, and government institutions should increase the access to and identify meals and snacks that contribute to better overall dietary quality and meet dietary guidelines. • Food services at worksites should identify and make available selections low in saturated fat, *trans* fat, sodium, and calories with expanded access to fruits, vegetables, and fiber-rich grain products. • Healthful foods should be promoted at all food sources, including packaged foods or in grocery stores, cafeterias, vending machines, or restaurants, by methods such as point-of-purchase displays. • Communities should support farmer's markets and community gardens. • Food carts should sell fresh fruits and vegetables in lower socioeconomic/underserved neighborhoods. Food carts and mobile vending units that sell near schools should adhere to the Institute of Medicine's nutrition standards for competitive foods in schools. • Work with city and urban planners to develop affordable and accessible public transit to help residents reach groceries and supermarkets. • Introduce urban land use policies and tax incentive that will attract supermarkets to low-income neighborhoods.
Goal: Ensure access to safe, appropriate, and enjoyable forms of physical activity, so that all ages can meet national guidelines for moderate and vigorous physical activity	• Physical education programs should be supported within the school curricula and within community activity centers. • Every community should commit to providing safe and convenient paths for walking and bicycling as a means of transportation and recreation. • Buildings should be designed so that stairwells are visible, convenient, and comfortable to use. Use of stairwells should be promoted through signs. • Worksites should provide employer-sponsored physical activity and fitness programs. • Schools should provide access to their physical activity space and facilities for community members outside normal school hours. • Campaign and informational approaches should promote physical activity.
Goal: Ensure a tobacco-free environment for all citizens.	• School facilities, property, vehicles, and school events should be smoke free and tobacco free. • Worksites should have formal smoking policies that prohibit smoking. • Local or state ordinances should prohibit smoking in public places; states should not preempt local ordinances that are more restrictive than the state's. • Indoor areas in correctional facilities should be smoke free. • Healthcare facilities should be smoke-free and tobacco free
Goal: Ensure clean air.	• Decrease air pollution with a goal of meeting EPA standards and reducing exposure to particulate matter in all communities.

(*Continued*)

Table 9 (Continued)

Intervention Goals	Recommended Actions
Policy change[3,6,105,109,117,118,135,136]	
Goal: Reduce initiation of tobacco use by adolescents and young adults and increase cessation among current smokers.	• Each state should fund state tobacco control programs at the level recommended by the Centers for Disease Control and Prevention and include in the programs evidence-based components. • Support significant increases in tobacco excise taxes at the state, county, or municipal levels. Seek opportunities to allocate a substantial portion of revenues generated by increased tobacco excise taxes to tobacco control, prevention and cessation programs, and other health-related initiatives such as those to improve access to health care. • State, local, and healthcare agencies should strongly encourage parents to make homes and cars smoke free. • Tobacco advertising and promotions that influence adolescents and young adults must be eliminated. • Laws prohibiting the sale of tobacco products to minors must be enforced. • State or local governments should regulate the display of tobacco advertising and products in stores and ban self-service displays and vending machines for tobacco. • All states should require retail licenses for sale of tobacco, which can be used to regulate and enforce regulations on sales to minors and advertising. • Substantial portions of the tobacco settlement monies should be used for tobacco control and other tobacco-related illnesses.
Goal: Encourage healthy messages in the mass media.	• Food advertising directed to youth should be limited to foods that are promoted within health guidelines. • Television shows for children should promote physical activity during commercial breaks.
Goal: Provide adequate reimbursement for clinical preventive and rehabilitative services.	• Insurance coverage should be provided for evidence-based treatments for nicotine dependency and for promoting healthful nutrition and physical activity (such as the Diabetes Prevention Program). • Clinical preventive services and early exercise-based outpatient cardiac rehabilitation should be covered by health insurance plans.
Goal: Reduce obesity.	• Implement and evaluate strategies to reduce consumption of sugar-sweetened beverages, including taxation, restriction within government feeding programs, and creation of nutrition standards for worksites, schools, and other public environments. • Ensure that supplies of fresh drinking water are freely available in all places such as through water fountains. • Provide calorie information in restaurants through menu labeling. • Invite consumers to advocate that restaurants downsize fast-food portions. • Require vending machine companies to replace unhealthy items with healthier choices. • Incorporate parks, wide sidewalks, and bike lanes into community and street design. • Consider healthcare costs and conduct health impact assessments in urban planning, altering ordinances to encourage development that promotes physical activity (higher density, mixed use, and high street connectivity).
Goal: Reduce sodium consumption.	• Encourage menu labeling. • Enact government policies to reduce sodium in packaged foods. • Increased access to fresh fruits and vegetables in urban communities. • Establish sodium limits within nutrition standards for schools, worksites, and procurement policies.

AED indicates automatic external defibrillator; AHA, American Heart Association; CPR, cardiopulmonary resuscitation; CVD, cardiovascular disease; EPA, Environmental Protection Agency; MI, myocardial infarction; and TIA, transient ischemic attack.

(Source: *Circulation*)

Table 10: Guide to Improving Cardiovascular Health at the Community Level: Intervention Goals and Current Public Health Programs (Pearson et al., 2013)

	Intervention Goals and Current Programs
Surveillance	
Goal: All communities should have access to data that CVD and stroke are leading causes of death and disability in men and women in their community.	AHA Heart Disease and Stroke Statistics Update[56] The AHA, in conjunction with the CDC, National Institutes of Health, and other government agencies, compiles up-to-date statistics on heart disease, stroke, and other vascular diseases in the Heart Disease and Stroke Statistical Update. This is a valuable resource for researchers, clinicians, healthcare policy makers, media professionals, the public, and others who seek the best national data available on disease morbidity, mortality, and risks; quality of care; medical procedures and operations; and costs associated with the management of these diseases. www.heart.org/statistics Arkansas Cardiovascular Health Examination Survey A model program at the state level is the Arkansas Cardiovascular Health Examination Survey, which uniquely combines interview and examination data at this level. www.healthy.arkansas.gov/programsServices/chronicDisease Behavioral Risk Factor Surveillance The Behavioral Risk Factor Surveillance Survey provides state-specific estimates of the prevalence of certain health-risk behaviors and of the delivery of clinical preventive services. http://www.cdc.gov/brfss/ CDC National Cardiovascular Disease Surveillance The system is designed to integrate multiple indicators from many data sources to provide a comprehensive picture of the public health burden of CVDs and associated risk factors in the United States at the national and state levels. http://www.cdc.gov/dhdsp/ncvdss/ County Health Rankings The University of Wisconsin Population Health Institute model is used to rank counties based on health behaviors (alcohol and tobacco use, diet, and exercise), clinical care (access and quality), and environment (built environment and environmental quality) using many data sources, including the Behavioral Risk Factor Surveillance Survey, NCHS, Census, and US Department of Agriculture Food Environment Atlas. http://www.countyhealthrankings.org/ CDC State Tobacco Activities Tracking and Evaluation System This system is an electronic data warehouse containing up-to-date and historical state-level data on tobacco use prevention and control. The system is designed to integrate many data sources to provide comprehensive summary data and to facilitate research and consistent data interpretation. The system was developed by the CDC in the Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion. http://apps.nccd.cdc.gov/statesystem/Default/Default.aspx Walk Score Walk Score measures how easy it is to live a car-light lifestyle. Walk Score measures the walkability of an address. The Walk Score algorithm awards points based on the distance to amenities in each category. Amenities within 0.25 mile receive maximum points, and no points are awarded for amenities >1 mile. http://www.walkscore.com/
Education[68]	
General health education	
Goal: All communities should provide information to its members about the burden, causes, and early symptoms of CVD and stroke.	AHA Heart Disease and Stroke Statistics Update[56] The AHA, in conjunction with the CDC, National Institutes of Health, and other government agencies, compiles up-to-date statistics on heart disease, stroke, and other vascular diseases in the Heart Disease and Stroke Statistical Update. This is a valuable resource for researchers, clinicians, healthcare policy makers, media professionals, the public, and others who seek the best national data available on disease morbidity, mortality, and risks; quality of care; medical procedures and operations; and costs associated with the management of these diseases. www.heart.org/statistics
Goal: Communities should provide materials and programs to motivate individuals and teach them skills for changing risk behaviors that will target multiple population subgroups.	AHA Go Red for Women: Know Your Numbers To dispel the myths and raise awareness of heart disease as the No. 1 killer of women, the AHA created Go Red For Women, a passionate, emotional, social initiative designed to empower women to take charge of their heart health. Know Your Numbers provides recommended goals for women for optimal behaviors (eg, blood pressure, cholesterol). http://www.goredforwomen.org/know_your_numbers.aspx AHA Heart360 Heart360 is an online tool that helps track and manage heart health and provides helpful advice and information. Health information can be entered in an easy-to-use tool, and records are safely and securely stored in Microsoft HealthVault. https://www.heart360.org/

Table 10 (Continued)

	AHA "Know your Heart" Program - Conozca Su Corazón The AHA has reached the Latino community through Conozca Su Corazón for many years. This program is derived from the ever-popular Answers by Heart materials translated into Spanish. http://es.heart.org/dheart/HEARTORG/Conditions/Answers-by-Heart-Fact-Sheets-Multi-language-Information_UCM_314158_Article.jsp
	AHA My Life Check/Life's Simple 7 My Life Check was designed by the AHA with the goal of improved health by educating the public on how best to live. These measures have one unique thing in common: any person can make these changes, the steps are not expensive to take, and even modest improvements to health will make a big difference. http://mylifecheck.heart.org/
	AHA/American Stroke Association Power to End Stroke Power to End Stroke educates blacks about their disproportionate risk of stroke and shares how to win the fight against that risk. Blacks are among those least aware despite having a high prevalence risk and have almost twice the risk of strokes compared with whites. http://www.powertoendstroke.org
	Active Living Research, A Robert Wood Johnson Foundation–Funded Center Active Living Research is a national program of the Robert Wood Johnson Foundation. Its primary goal is to support and share research on environmental and policy strategies that can promote daily physical activity for children and families across the United States. Active Living Research places special emphasis on research related to children of color and lower-income children who are at highest risk for obesity. www.activelivingresearch.org
	Association of Black Cardiologists Founded in 1974, the Association of Black Cardiologists, Inc, is a nonprofit organization with an international membership of 2500 health professionals, lay members of the community (community health advocates), corporate members, and institutional members. The association is dedicated to eliminating the disparities related to cardiovascular disease in all people of color. http://www.abcardio.org/
	CDC *Morbidity and Mortality Weekly Report* The *Morbidity and Mortality Weekly Report* is a weekly epidemiological digest for the United States published by the CDC. It is the main vehicle for publishing public health information and recommendations that have been received by the CDC from state health departments, with each issue covering reports that have been received in the week through Friday and published on the following Friday. http://www.cdc.gov/mmwr/
	Department of Health and Human Services and NHLBI Heart and Vascular Diseases Facts Program This program provides educational information on improving lifestyle behaviors, meeting recommended goals for risk factors/behaviors, and CVD symptoms and treatment. http://www.nhlbi.nih.gov/health/public/heart/
	Red Dress Campaigns The Red Dress, the centerpiece of The Heart Truth, is a red alert that inspires women to take action to protect their heart health. The Red Dress was designed to build awareness that women are at risk for heart disease and to motivate them to take action to reduce their risk. http://www.nhlbi.nih.gov/educational/hearttruth/about/red-dress.htm
School and youth education	
Goal: All schools should have research-based comprehensive and age-appropriate curricula about cardiovascular health and ways to improve health behaviors and reduce CVD risk.	Alliance for a Healthier Generation The Alliance for a Healthier Generation works to address one of the nation's leading public health threats: childhood obesity. The goal of the alliance is to reduce the prevalence of childhood obesity by 2015, and to empower kids nationwide to make healthy lifestyle choices. Founded in 2005 by the AHA and William J. Clinton Foundation, the alliance works to positively affect the places that can make a difference in a child's health: homes, schools, doctor's offices, and communities. http://www.healthiergeneration.org/about.aspx
Goal: All schools should implement age-appropriate curricula on changing dietary, physical activity, and smoking behaviors.	Coordinated Approach to Child Health (CATCH) CATCH is an Education Agency–approved Coordinated School Health Program designed to promote physical activity and healthy food choices and to prevent tobacco use in elementary school–aged children. CATCH focuses on coordinating 4 components: the Eat Smart school nutrition program, kindergarten–grade 5 and grades 6–8 classroom curriculums, a physical education program, and a family program. https://sph.uth.tmc.edu/catch/ and http://catchusa.org/
Goal: All schools should provide teaching of early warning signs of MI and stroke and appropriate initial steps of emergency care.	

Table 10 (Continued)

	Let's Move! Let's Move! is a comprehensive initiative, launched in 2010 by the First Lady Michelle Obama, dedicated to addressing the challenge of childhood obesity within a generation, so that children born today will grow up healthier and able to pursue their dreams. Combining comprehensive strategies with common sense, Let's Move! is about putting children on the path to a healthy future during their earliest months and years by giving parents helpful information and fostering environments that support healthy choices, providing healthier foods in schools, ensuring that every family has access to healthy, affordable food, and helping kids become more physically active. http://www.letsmove.gov/
	Shape Up America! Shape Up America! is a 501(c)3 not-for-profit organization committed to raising awareness of obesity as a health issue and to providing responsible information on healthy weight management. The Web site provides information and ideas for community members and healthcare professionals on achievement of healthy weight. http://www.shapeup.org/
	2008 US Physical Activity Guidelines The 2008 Physical Activity Guidelines for Americans provide science-based guidance to help Americans ≥6 y of age to improve their health through appropriate physical activity. Developed with health professionals and policy makers in mind, the guidelines can help an individual learn about the health benefits of physical activity, understand how to do physical activity in a manner that meets the guidelines, understand how to reduce the risks of activity-related injury, and assist others in participating regularly in physical activity. http://health.gov/paguidelines/
Worksite education Goal: All worksites should provide materials and services to motivate and assist employees to adopt and maintain heart healthy behaviors. Goal: All worksites should provide instruction in early warning signs of MI and stroke and appropriate initial steps of emergency care.	CDC National Healthy Worksite Program The National Healthy Worksite Program is designed to assist employers in implementing science and practice-based prevention and wellness strategies that will lead to specific, measureable health outcomes to reduce chronic disease rates. http://www.cdc.gov/NationalHealthyWorksite/
	Stanford Health Improvement Program Over the past 25 years, Stanford University has developed an exemplary educational program to promote health, particularly cardiovascular health, to its employees. This program is integrated with health insurance plan incentives and provides a broad range of health promotion and physical activity programs. Through the BeWell Program, this program is integrated with the department of athletics, recreation, and physical education and offers social networking support for behavior change. http://hip.stanford.edu/
	HealthLead, US Healthiest Workplace Accreditation Program HealthLead recognizes employers for meeting recognized standards to promote health and well-being among their employees. It is designed to provide a competitive edge to organizations, both in the eyes of the financial community and in attracting prospective employees as a "best place" to work. http://www.ushealthiest.org/index.php
	Partnership for Prevention's Leading by Example This initiative has been well received by business leaders as a highly successful and respected CEO-to-CEO communications campaign targeted to raising awareness of the benefits of engaging in worksite health. The Leading by Example mission has helped fuel a consensus among senior management that their support is a prerequisite for creating an employer's culture of good health for its employees. http://www.prevent.org/
Healthcare facility education Goal: All healthcare facilities should make available research-based, effective educational materials and programs about changing and maintaining risk factors/risk behaviors, ways to prevent CVD and stroke, and early warning signs of CVD and stroke.	Preventive Cardiovascular Nurses Association This association is the leading nursing organization dedicated to preventing CVD through assessing risk, facilitating lifestyle changes, and guiding individuals to achieve treatment goals. The association is committed to educating and supporting nurses so that they may successfully rise to the current state of healthcare demands. http://www.pcna.net/about/index.php

Table 10 (Continued)

Community Organization and Partnering	
Goal: All communities will have an action plan for CVD and stroke prevention and control with specific targets and goals.	CDC Public Health Action Plan to Prevent Heart Disease and Stroke Key partners, public health experts, and heart disease and stroke prevention specialists came together to develop targeted recommendations and specific action steps toward the achievement of national goals for preventing heart disease and stroke over the next few decades, through 2020 and beyond. http://www.cdc.gov/dhdsp/action_plan/index.htm
Goal: All communities will provide materials and services for risk behavior and risk factor change that are research based whenever possible.	CDC Community Health Assessment and Group Evaluation Action Guide This guide is a data-collection tool and planning resource for community members who want to make their community a healthier one. The purpose of this guide is to gather and organize data on community assets and potential areas for improvement before deciding on the critical issues to be addressed in a community action plan. http://www.cdc.gov/healthycommunitiesprogram/tools/change/downloads.htm
	CDC Prevention Research Centers This program directs a national network of 37 academic research centers, each at either a school of public health or a medical school that has a preventive medicine residency program. The centers are committed to community-based, participatory prevention research needed to drive the major community changes that can prevent and control chronic diseases. http://www.cdc.gov/prc/about-prc-program/index.htm
	CDC Racial and Ethnic Approaches to Community Health The CDC has responded to disparities in health among racial and ethnic minority populations by launching Racial and Ethnic Approaches to Community Health. The CDC funds communities to address key health areas in which minority groups traditionally experience serious inequities in health outcomes. The communities form coalitions that plan, implement, and evaluate strategies to focus on the needs of 1 or more groups that include black, Alaska Natives, American Indians, Asian Americans, Hispanics/Latinos, and Pacific Islanders. Each community brings together a diverse group of people from a variety of sectors to develop, implement, and evaluate unique disease prevention and health promotion strategies. http://www.cdc.gov/reach/
	Communities Putting Prevention to Work Communities Putting Prevention to Work is a locally driven initiative supporting 50 communities to tackle obesity and tobacco use, 2 leading preventable causes of death and disability in the United States. The initiative is supporting 50 communities to tackle obesity and tobacco use. By effectively addressing obesity and tobacco use through environmental change at the local level, this program can have a significant impact on preventing serious health problems such as heart disease, stroke, type 2 diabetes mellitus, and cancer. http://www.cdc.gov/CommunitiesPuttingPreventiontoWork/index.htm
	Community Transformation Grant The Community Transformation Grants program will support community-level efforts to reduce chronic diseases such as heart disease, cancer, stroke, and diabetes mellitus. By promoting healthy lifestyles, especially among population groups experiencing the greatest burden of chronic disease, these grants will help improve health, reduce health disparities, and control healthcare spending. http://www.cdc.gov/communitytransformation/
	Presidential Active Lifestyle Award The President's Council on Fitness, Sports and Nutrition provides programs and partnerships with the public, private, and nonprofit sectors. The council serves as a catalyst to promote healthy lifestyles through fitness, sports and nutrition programs and initiatives that engage Americans across the life span. http://www.fitness.gov/
	National Physical Activity Plan The National Physical Activity Plan is a comprehensive set of policies, programs, and initiatives that aim to increase physical activity in all segments of the American population. The plan is the product of a private-public sector collaborative. Hundreds of organizations are working together to change our communities in ways that will enable every American to be sufficiently physically active. http://www.physicalactivityplan.org/
	Partnership for a Healthier America The Partnership for a Healthier America supports the First Lady's Let's Move! program by encouraging, tracking, and communicating commitments to healthier lifestyles from partner organizations, commitments that align with the priorities of the Partnership for a Healthier America. http://www.ahealthieramerica.org/#!/our-partners

Table 10 (Continued)

Ensuring personal health services	
Goal: Increase the percentage of people at risk who maintain or reduce risk factors to goal levels as established by national guidelines.	The Affordable Care Act In addition to increasing access to care, this act provides coverage for a new "wellness visit" and eliminates cost sharing for almost all of the preventive services. http://www.medicareadvocacy.org/2010/09/09/affordable-care-act-expands-medicare-coverage-for-prevention-and-wellness/
Goal: Increase the percentage of patients suffering from acute coronary syndromes (eg, myocardial infarction, cardiac arrhythmias) or cerebrovascular syndromes (eg, stroke and TIA) who receive appropriate acute interventions within the time frame of maximal effectiveness.	Cholesterol Guideline Update (ATP III)[59] The Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III [ATP III]) presents the National Cholesterol Education Program's updated recommendations for cholesterol testing and management. An updated version (ATP IV) is expected in 2013. Blood Pressure Guidelines (JNC) 7[71] The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure provides a new guideline for hypertension prevention and management. An updated version (JNC 8) is expected in 2013.
Goal: Provide training concerning smoking cessation, physical activity, nutrition, and effective behavior change counseling methods in medical schools and appropriate residency programs.	CDC National Diabetes Prevention Program The National Diabetes Prevention Program is a public-private partnership of community organizations, private insurers, employers, healthcare organizations, and government agencies. These partners are working to establish local evidence-based lifestyle change programs for people at high risk for type 2 diabetes mellitus. http://www.cdc.gov/diabetes/prevention/ NHLBI Integrated Guidelines for Cardiovascular Health and Risk Reduction for Youth and Adults The NHLBI is leading the development of an integrated set of cardiovascular risk reduction guidelines for adults using state-of-the-art methodology. Cholesterol, hypertension, and obesity guidelines are being updated, and an integrated cardiovascular risk reduction guideline is being developed. http://www.nhlbi.nih.gov/guidelines/cvd_adult/background.htm; http://www.nhlbi.nih.gov/guidelines/cvd_ped/index.htm Million Hearts Initiative Million Hearts is a national initiative that was launched by the Department of Health and Human Services in September 2011 to prevent 1 million heart attacks and strokes over 5 years. The initiative will achieve its goal by emphasizing cardiovascular health across patients, providers, communities, and other stakeholders. Million Hearts has brought together a number of programs, policies, and campaigns designed to make a positive impact across the spectrum of prevention and care, promoting the "ABCS" of clinical prevention (appropriate aspirin therapy, blood pressure control, cholesterol management, and smoking cessation), as well as healthier lifestyles and communities. http://millionhearts.hhs.gov/index.html AHA Statement on Reducing Delay in Seeking Treatment[74] This scientific statement summarizes the evidence that demonstrates the benefits of early treatment, provides information on intervention programs, and offers suggestions for clinical practice and future research. Rapid Early Action for Coronary Treatment[137] Intervention to increase knowledge of heart attack symptoms was used in 20 communities to reduce patient-associated prehospital delay. The communities were in Alabama, Louisiana, Massachusetts, Minnesota, North Dakota, Oregon, South Dakota, Texas, Washington, and Wisconsin.
Environmental change	
Goal: Ensure access to healthy foods so that all members of the community can meet national dietary recommendations.	2010 Dietary Guidelines The 2010 Dietary Guidelines for Americans is the federal government's evidence-based nutritional guideline to promote health, reduce the risk of chronic diseases, and reduce the prevalence of overweight and obesity http://www.cnpp.usda.gov/DietaryGuidelines.htm through improved nutrition and physical activity. AHA Diet and Lifestyle Guidelines[106] Improving diet and lifestyle is a critical component of the AHA's strategy to prevent CVD. This document presents diet and lifestyle recommendations designed to meet this objective. AHA Heart-Check Meal Certification Program The AHA's Heart-Check mark on food packaging signifies that the food has been certified to meet the AHA's guidelines for a heart-healthy food. It is a good first step in creating an overall sensible eating plan. The Web site has a list of all AHA Heart-Check certified food products that can be found in grocery stores and restaurants. www.heartcheckmark.org Center for Science in the Public Interest: *Trans* Fat Bans in Restaurants The Center for Science in the Public Interest provides information on the risks associated with *trans* fat and provides examples of local and state legislation that bans *trans* fat from restaurants. http://www.cspinet.org/transfat/about.html

Table 10 (Continued)

	Growing Power Growing Power transforms communities by supporting people from diverse backgrounds and the environment in which they live through the development of community food systems. These systems provide high-quality, safe, healthy, affordable food for all residents in the community. Growing Power develops community food centers, as a key component of community food systems, through training, active demonstration, outreach, and technical assistance. http://www.growingpower.org/
Goal: Ensure access to safe, appropriate, and enjoyable forms of physical activity, so that all ages can meet national guidelines for moderate and vigorous physical activity.	*The Guide to Community Preventive Services* *The Guide to Community Preventive Services* provides recommendations for physical activity interventions. http://www.thecommunityguide.org/pa/index.html
	Robert Wood Johnson Foundation Active Living by Design National Program Active Living creates community-led change by working with local and national partners to build a culture of active living and healthy eating. www.activelivingbydesign.org
	Blue Zones Pilot Project A prototype Blue Zones community transformation program, sponsored by AARP and the United Health Foundation, was completed in Albert Lea, MN, in 2009. This community program focused on environmental interventions across 4 domains: community, social networks, habitat and inner self. Blue Zones worked with Albert Lea's leaders to transform the way the residents eat, work, exercise, and play. http://www.bluezones.com/programs/blue-zones-communities/albert-lea-mn/
Goal: Ensure a tobacco-free environment for all citizens	Bridging the Gap Bridging the Gap is a nationally recognized research program. Its goal is to improve the understanding of how policies and environmental factors affect diet, physical activity and obesity among youth, as well as youth tobacco use. http://www.bridgingthegapresearch.org/
	State Tobacco Control Program Several states have developed exemplary tobacco control programs combining multiple interventions, including excise taxes, mass media education, quit lines, and school programs. Both California and New York developed robust programs in the 1990s; these are still good programs although funding has been cut substantially over the past 2 decades. Rhode Island and Massachusetts also have innovative programs. http://www.cdph.ca.gov/programs/Tobacco/Pages/default.aspx http://www.health.ny.gov/prevention/tobacco_control/ http://www.health.ri.gov/programs/tobaccocontrol/index.php http://www.mass.gov/dph/mtcp
Goal: Ensure clean air.	Environmental Protection Agency Air Quality Index The Air Quality Index is an index for reporting daily air quality. It tells how clean or polluted the air is and what associated health effects might be of concern. The Air Quality Index focuses on health effects that an individual may experience within a few hours or days after breathing polluted air. http://airnow.gov/
	Environmental Protection Agency Particulate Matter Web Site This Web site provides information on the health effects of particulate pollution, standards for particle pollution, and programs and requirements for reducing particle pollution. http://www.epa.gov/air/particlepollution/index.html
Policy change	AHA and Nonprofit Advocacy: Past, Present, and Future: A Policy Recommendation From the AHA[138] Influencing public policy through advocacy is an essential strategy used by the AHA to achieve its health impact goals and programmatic objectives. This article provides the historical context of AHA advocacy, the organizational and legal structure under which these activities are carried out, the process used to develop the association's public policy positions and goals, the approaches used to achieve these goals, and the methods developed to evaluate progress. This statement also examines the various tools and tactics that advocacy organizations use to influence public policy.
Goal: Reduce initiation of tobacco use by adolescents and young adults.	AHA Policy Statement on Health Education in Schools[139] The American Heart Association believes that quality health education programs delivered in the nation's schools can improve the well-being and health of children and youth. School health education programs can reduce health risk behaviors such as tobacco use.
	AHA Policy Statement on Clean Indoor Air Laws and the Impact on Cardiovascular Disease[140] The AHA advocates for comprehensive smoke-free workplace laws across the United States that are in compliance with the Fundamentals of Smoke-Free Workplace Laws guidelines. The AHA believes that smoke free laws should apply to all workplaces and public environments and that there should be no preemption of local ordinances and no exemptions for hardship, opting out, or ventilation. Other exemptions to be avoided include casinos and gaming organizations, bars, tobacco shops, and private clubs.

Table 10 (Continued)

	CDC Tobacco Use Prevention Through Schools To help prevent tobacco use and addiction among young people, the CDC supports effective school-based policies, programs, and practices to address this major health issue. This site provides guidelines and strategies, as well as program success stories. http://www.cdc.gov/healthyyouth/tobacco/index.htm
	State Tobacco Control Program Several states have developed exemplary tobacco control programs combining multiple interventions, including excise taxes, mass media education, quit lines, and school programs. Both California and New York developed robust programs in the 1990s; these are still good programs although funding has been cut substantially over the past 2 decades. Rhode Island and Massachusetts also have innovative programs. http://www.cdph.ca.gov/programs/Tobacco/Pages/default.aspx http://www.health.ny.gov/prevention/tobacco_control/ http://www.health.ri.gov/programs/tobaccocontrol/index.php http://www.mass.gov/dph/mtcp
Goal: Encourage healthy messages in the mass media.	Strategy Guide on Fostering School Connectedness School connectedness—the belief held by students that adults and peers in the school care about their learning as well as about them as individuals—is an important protective factor against early sexual initiation, alcohol, tobacco and other drug use, violence, and gang involvement. This guide provides 6 strategies that teachers, administrators, other school staff, and parents can implement to increase the extent to which students feel connected to school. http://www.cdc.gov/healthyyouth/AdolescentHealth/connectedness.htm
Goal: Provide adequate reimbursement for clinical preventive and rehabilitative services.	AHA Principles of Health Care Reform[141] Preventive benefits should be an essential component of meaningful healthcare coverage, and incentives should be built into the healthcare system to promote appropriate preventive health strategies.
	The Affordable Care Act In addition to increasing access to care, this act provides coverage for a new “wellness visit” and eliminates cost sharing for almost all of the preventive services. http://www.medicareadvocacy.org/2010/09/09/affordable-care-act-expands-medicare-coverage-for-prevention-and-wellness/
Goal: Reduce obesity.	AHA Policy Position Statement on Food Advertising and Marketing Practices to Children[142] The AHA believes Congress should restore to the Federal Trade Commission and the Federal Communications Commission the ability to regulate marketing of foods and beverages to children. The AHA would support other measures that restrict food advertising and marketing to children, including but not limited to allowing only healthy foods to be marketed and advertised to children, discouraging the product placement of food brands in multiple media technologies, eliminating the use of toys in unhealthy kids’ restaurant meals, using licensed characters on only healthy foods, and not allowing food and beverage advertising and marketing in schools or on educational materials.
	AHA Policy Position Statement on Menu Labeling[143] The AHA supports providing calorie information on menus and menu boards at point of purchase. Although the ultimate goal is to provide this information in all restaurants, initially it should be required only in restaurants with standardized menus and recipes that do not vary day to day. In tandem with this recommendation, the AHA supports the development and implementation of a consumer education campaign to help people “know their energy needs” for recommended daily calorie intake and food and beverage serving sizes.
	AHA Policy Recommendations for Obesity Prevention and Health Promotion in Child Care Settings[144] The AHA advocates for strong health promotion and obesity prevention programs in early childhood programs.
Goal: Reduce sodium consumption.	Center for Nutrition Policy and Promotion The center improves the nutrition and well-being of Americans by developing and promoting dietary guidance that links scientific research to the nutrition needs of consumers. http://www.cnpp.usda.gov/
	Health Text Messaging Recommendations to the Secretary The Department of Health and Human Services has been actively exploring means to capitalize on the rapid proliferation of mobile phone technology and platforms such as text messaging, to develop programs and/or partnerships with the overall aim of improving public health. http://www.hhs.gov/open/initiatives/mhealth/recommendations.html

Table 10 (Continued)

	Active Living Research, A Robert Wood Johnson Foundation Funded Center Active Living Research is a national program of the Robert Wood Johnson Foundation. Its primary goal is to support and share research on environmental and policy strategies that can promote daily physical activity for children and families across the United States. Active Living Research places special emphasis on research related to children of color and lower-income children who are at highest risk for obesity. www.activelivingresearch.org
	Interagency Working Group on Food Marketed to Children: Preliminary Proposed Nutrition Principles to Guide Industry Self-Regulatory Efforts The Interagency Working Group is made up of representatives from the Federal Trade Commission, the CDC, the Food and Drug Administration, and the US Department of Agriculture. The working group has drafted a set of principles pursuant to a directive from Congress, as set out in the 2009 Omnibus Appropriations Act, with the goal of improving children's diets and addressing the high rates of childhood obesity. Marketing can be an effective tool to encourage children to make better food choices, and voluntary adoption by industry of strong, uniform nutrition and marketing principles, like those proposed here, will advance the goal of promoting children's health. http://www.ftc.gov/os/2011/04/110428foodmarketproposedguide.pdf
	AHA Sodium Reduction Initiative The AHA wants to help all Americans lower the amount of sodium they consume. Here is what we are doing to help: encouraging manufacturers to reduce the amount of sodium in the food supply, advocating for more healthy foods to be available and accessible (eg, more fruits and vegetables and lower sodium standards in the food supply), and providing consumers with education and decision-making tools to make better food choices. www.heart.org/sodium
	Menu Labeling: Center for Science in the Public Interest This center provides campaigns and education programs for states and localities to implement to support menu labeling and to encourage healthy eating at restaurants and the use of the available nutrition information. http://www.cspinet.org/menulabeling/
	Food and Farm Bill The Farm Bill goes far beyond America's farms. Every 5 years, the Farm Bill sets policies that govern a broad array of programs, from crop support to conservation and from food assistance to forestry. The Farm Bill makes up only ≈2% of federal funding, but every American benefits from its provisions. Funding for nutrition programs makes up nearly 80% of Farm Bill spending. The rest of the bill supports America's farmers, ranchers, and consumers through initiatives such as commodity programs, agricultural research, trade, and rural development. http://agriculture.house.gov/
	National Salt Reduction Initiative The New York City Health Department is coordinating a national effort to prevent heart attacks and strokes by reducing the amount of salt in packaged and restaurant foods. The National Salt Reduction Initiative is a coalition of local and state health authorities and health organizations working to help food manufacturers and restaurants voluntarily reduce the amount of salt in their products. http://www.nyc.gov/html/doh/html/cardio/cardio-salt-initiative.shtml
	The Alabama State Board of Education The Alabama State Board of Education enacted a policy in July 2005 that establishes criteria for sodium levels in single-serving snacks in school settings. http://cnp.alsde.edu/NutritionPolicy/AlaHealthySnackStandards.pdf

AARP indicates American Association of Retired Persons; AHA, American Heart Association; CDC, Centers for Disease Control and Prevention; CEO, chief executive officer; CVD, cardiovascular disease; NCHS, National Center for Health Statistics; and NHLBI, National Heart, Lung, and Blood Institute.

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