World Heart Day is September 29, 2002. This occasion provides an opportunity to recognize our successes in science and clinical care, to survey the present and future challenges at home and abroad, and to seek opportunities for international partnerships in addressing the burgeoning global epidemic of cardiovascular disease.

The final decades of the twentieth century represented a period of unprecedented success for the cardiovascular biomedical enterprise in advancing the knowledge of cardiovascular disease. Scientific progress in understanding the mechanisms of cardiovascular diseases fueled the proliferation of new methods for prevention and treatment, clinical trials to critically test these interventions, and evidence-based practice guidelines to distill these scientific advances broadly into clinical practice.

The Domestic Challenges

Despite major steps forward in the fight against cardiovascular disease, there is compelling evidence in the United States that we have not been fully effective in translating, disseminating, and expediting the adoption of scientific advances to improve outcomes for our society. We have failed to develop public health infrastructures and healthcare systems in parallel with the scientific progress to implement effective, evidence-based prevention and treatment strategies. Hence, we have not realized the potential of our scientific discoveries for improved cardiovascular health. A recent Institute of Medicine report underscored this dilemma, indicating that "between the care we have and the care we could have lies not just a gap, but a chasm." The chasm may impede our efforts to achieve the Healthy People 2010 Objectives for the US population, as established by the Department of Health and Human Services.

The US healthcare system is facing serious access and quality issues. Large segments of the US population do not have access to mainstream health care. These include the uninsured, a segment of the population that includes not only the unemployed but also many self-employed and low-wage earners. It is estimated that 39 million US citizens have no health insurance. Our elderly, who are dependent on Medicare coverage, also face increasing access challenges as cuts in reimbursement have led many physicians to reduce screening, testing, and treatment, and in some instances close their practices altogether to Medicare enrollees. As much as 33% of the elderly have no prescription drug insurance, and many others are poorly covered. Finally, our ethnic and racial minorities represent a large and growing medically underserved segment of the population. These segments of our populations are not receiving clear messages about cardiovascular prevention, and those who do often cannot afford necessary medications and check-ups. Even those who have access to health care are faced with growing uneasiness, real or perceived, about the quality of care that they are receiving.

The current access and quality issues will be compounded in the coming years by 3 factors that will serve to accelerate the rate of cardiovascular disease and its complications. First, aging of the population will undoubtedly result in a concomitant increase in the incidence of chronic diseases, including coronary artery disease, heart failure, and stroke. The US Census Bureau estimates that there will be 40 million individuals aged >65 years in the United States in 2010. Second, we are experiencing an explosive increase in the prevalence of obesity and type 2 diabetes with their related complications of hypertension, hyperlipidemia, and atherosclerotic vascular disease. In 1999, 35% of US adults were considered overweight (body mass index 25 to 29.9 kg/m²), and another 26% were considered obese (body mass index ≥30 kg/m²). An estimated 29% of adults do not engage in any physical activity, and another 46% do not achieve the recommended physical activity level.

There are presently 17 million individuals in the United States with diabetes mellitus. This represents a doubling in disease prevalence over the past decade, and the number continues to increase precipitously. Finally, there is an alarming increase in unattended risk factors in the younger generations that will continue to fuel the cardiovascular epidemic for years to come.

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such that the term “adult onset” is no longer considered applicable. Teenage smoking continues to be a major health hazard.\textsuperscript{17,18} Nearly 30\% of high school students are present smokers,\textsuperscript{19} with roughly 5000 teenagers taking their first cigarette every day, 2000 of whom will become chronic smokers.\textsuperscript{19}

The Global Burden of Cardiovascular Disease

These domestic issues that will continue to challenge our healthcare system, as daunting as they appear to be, are dwarfed by the impending crisis in cardiovascular health on an international level. We are in the midst of a true cardiovascular pandemic. It has been apparent for the past decade that heart disease is not only the leading cause of death, disability, and healthcare expense in the United States, but also the leading cause of death worldwide.\textsuperscript{20–24} According to World Health Organization (WHO) estimates, cardiovascular disease killed 14.7 million individuals in 1990 and 17 million in 1999.\textsuperscript{20,23,24} Cardiovascular disease is the leading cause of mortality in every region of the world except sub-Saharan Africa, and it is anticipated that cardiovascular disease will eclipse the present leader in that region, infectious disease, within the next few years.

It is noteworthy that the principal cardiovascular disorder responsible for the global rise in mortality is no longer rheumatic heart disease, but rather atherosclerotic vascular disease. Ischemic heart disease is the leading cause of death in the world, and cerebrovascular disease is the second leading cause.\textsuperscript{20,24} Cardiovascular diseases are responsible for 30\% of all deaths worldwide each year.\textsuperscript{20,24} It is often assumed that atherosclerosis is a disease of affluent, industrialized countries. However, 80\% of these deaths occur in low-to-middle income countries of varying size like China, Russia, Poland, Mauritius, Argentina, and India.\textsuperscript{23} In many countries, the need for care already outstrips the ability to provide it to its citizens. Throughout the world, even in economically advanced societies, there are deficiencies in preventive and acute care that might stem the tide of this epidemic.

All of the issues that contribute to the continued impact of cardiovascular disease in the United States—access to care, quality of care, aging of the population, explosion in the prevalence of obesity and diabetes, tobacco consumption and physical inactivity—have profound global implications. There are also many regional, economic, political, and cultural factors that influence the impact of each of these issues at the local level and that make uniform global recommendations difficult or impractical. Nonetheless, it is clear that lasting solutions to the problem require coordinated, preventive strategies.

According to WHO data, an estimated 1 billion people across the world are now overweight or obese.\textsuperscript{25} The worldwide trend is due in part to the increasing westernization of many traditional diets—fruits, vegetables, and whole grains are being replaced by calorie-dense, easily accessible foods that are high in saturated fat, sugar, and refined carbohydrates. Obesity is as much an issue for low-income countries as it is for more affluent countries. A one percent increase in the prevalence of obesity in such countries as India and China leads to 20 million additional cases of obesity. The WHO estimates that about 18 million children under the age of 5 are overweight,\textsuperscript{26} and these children are at an increased risk of developing dyslipidemia and hypertension as early as their teen years.

Obesity is also the result of a decline in physical activity. WHO estimates that 60\% of the world population is insufficiently physically active,\textsuperscript{23} a situation that is particularly acute among women and that undoubtedly contributes to the increase in obesity and diabetes. The trend for inactivity is evident both in countries with established market economies and in urban areas of low-income and middle-income countries, and especially in poorer communities.\textsuperscript{23} This trend is influenced heavily by cultural patterns, traditions, and the lack of civic organizations to promote the benefits of exercise. In low-income and middle-income countries that previously relied on walking or bicycling for transportation, increasing prosperity has brought an influx of automobiles and public transportation, which most people prefer not only for convenience but also as demonstration of status, which further contributes to inactivity.

Overweight, obesity, and physical inactivity also contribute to the global burden of hypertension, the major risk factor for stroke and an important independent contributor to coronary heart disease, chronic heart failure, and other cardiovascular diseases. The Global Burden of Disease Study\textsuperscript{20} suggested that in 1990 alone, 2.9 million deaths or 5.8\% of total deaths were attributable to hypertension. Of the estimated 690 million persons who have hypertension, most of them remain untreated or uncontrolled.\textsuperscript{27} There is now ample evidence that worldwide, safe and effective strategies for the prevention and control of hypertension are underused.

Diabetes presently affects 150 million individuals worldwide, and its prevalence, especially among younger people, is expected to double in the next 25 years.\textsuperscript{28} The 300 million diabetics in 2025 will represent 5.4\% of the world’s population. The highest increase is projected in India and China, where the prevalence of diabetes in these 2 countries combined will rise from 45 million in 1995 to an estimated 95 million in 2025.\textsuperscript{28}

Tobacco consumption is also increasing throughout the world. Excess mortality from cardiovascular disease and stroke is 2-fold to 3-fold higher among smokers compared with nonsmokers. More than 60\% of men in China are present smokers, as are 40\% of men in India.\textsuperscript{23} Smoking is also increasing at an alarming rate among women, especially in Eastern Europe. It is estimated that the number of individuals who smoke will increase by 500 million throughout the world in the next quarter century.\textsuperscript{21}

Although there are a number of factors that contribute to the burgeoning cardiovascular health crisis, a message that must be provided clearly and resolutely is that much of the death and disability from heart disease and stroke is preventable. This public health message must be heard by governments, healthcare providers, and the public.

Strategic Approach to the Solution

The global cardiovascular epidemic can be overcome only through a process of strategic, collaborative international
partnerships. It is important for concerned physicians who care for patients with cardiovascular diseases to play a leadership role in this process, as they understand the natural history and complications of these disorders and the impact imposed on patients and their families and communities. More physicians and nurses need to participate in cardiovascular prevention. Indeed, it was concerned and forward-thinking physicians experiencing heart disease firsthand who determined that coordinated efforts were needed to confront the clinical and societal issues and who were instrumental in the formation of the American Heart Association (AHA) and the National Heart, Lung, and Blood Institute (NHLBI). Leaders of the AHA at the end of World War II, who also were pivotal figures in the founding of the NHLBI, such as Drs Paul Dudley White, Louis N. Katz, and Howard B. Sprague, were deeply concerned about the growing burden of cardiovascular disease on the global level. As noted by Dr Lewis E. January, president of the AHA from 1966 to 1967, “Heart disease is a worldwide problem and its prevention and control require obtaining information on a worldwide basis.”

International cooperation led to important epidemiological studies to understand the causes of cardiovascular disease internationally, such as the Seven Countries Study, which was a landmark undertaking that demonstrated the importance of diet as a determinant of cardiovascular risk.

We support the recommendations of the Institute of Medicine (IOM) of the US National Academy of Sciences in its 1998 report on the control of international cardiovascular disease. The IOM recommended investment in research and development in several essential areas. These included research to fully determine the magnitude of cardiovascular disease in low-income and middle-income countries, the development of targeted primary prevention strategies, reduction in tobacco use, control of hypertension, access to low-cost drugs, and the development of affordable clinical care algorithms. To support these recommendations, the IOM also stressed 2 additional points: the need to build capacity to conduct research and development activities and the need to develop institutional frameworks that would facilitate cardiovascular disease prevention and control.

In response to a call to action from an international panel, a global initiative is coalescing, which will focus on achieving several goals similar to those discussed in the IOM report. The World Heart Federation, of which the AHA is a founding member, has formed the World Heart Forum to confront global cardiovascular issues. The initial agenda of this coalition includes 4 processes: (1) research to better understand the epidemiology of cardiovascular disease in various regions of the world, and to more accurately track its toll in terms of death, disability, and healthcare costs; (2) development of prevention guidelines to identify common principles for lowering cardiovascular risk, while at the same time providing flexibility to address regional differences (eg, it is expected that, in some countries or regions of the world, tobacco use and hypertension may take precedence, whereas cholesterol reduction or weight control may be of primary importance in others); (3) development of programs to assist medical schools in establishing core curricula which focus on the prevention of cardiovascular disease; and (4) involvement in advocacy initiatives that address regional issues of tobacco, exercise, nutrition, and access to care. These 4 goals represent enormous challenges, but also an enormous opportunity to build greater international understanding and cooperation. It is essential for the success of the Forum that it also addresses the need for more rapid, effective communication of scientific advances to health professionals and the public.

World Heart Day, on September 29, provides an opportunity to encourage global cardiovascular disease prevention. It offers each of us, in every country, a chance to strongly support and recommend a population-based preventive strategy that is the only meaningful long-term approach to lessen the global burden of cardiovascular disease. As stated most eloquently in the Victoria Declaration a decade ago, “We have the scientific knowledge to create a world in which most heart disease and stroke could be eliminated.” What is needed now is the combination of necessary infrastructure and political will on a global scale to take effective action to provide a heart-healthy and stroke-free world.

References


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