PART I.
LAYING THE FOUNDATION
1. General Principles of Health Promotion and Disease Prevention

The scientific engines of the 20th century powered a revolution in biomedical sciences. These advances delivered deeper understanding of the dynamics of biological processes, amazing new pharmaceuticals, and space-age techniques for visualizing and treating problems deep inside the body. They have remedied many kinds of diseases and injuries for millions of people—but they have left the remaining billions with most of the same scourges their grandparents suffered 100 years ago.

The 21st century cries out for a new dimension of revolution, one that is not expressed mainly in organic chemistry, or in subcellular messengers, or in genomics. Rather, it will be expressed in the expectations, overriding goals, actions, and commitments of individuals, families, communities, and nations. No group of people, no matter how privileged and protected, can feel smugly safe and immune from the biopsychosocial epidemics of suffering that roam unchecked through the majority of the neighborhoods in this global village.

The new health revolution must carry the most potent advances in our scientific framework of knowledge to the people and places where they can make the difference between life and death. Only then can the possibility of “health for all” see its sunrise.

HUMAN AND ECONOMIC VALUES OF PREVENTION

Health is the first and most important form of wealth. Health—the physical, mental, and social health of an entire population—is a nation’s fundamental natural resource. If it is ignored or wasted, farms will wither, mines will close, factory engines will slow their production, families will break up, and children’s laughter will no longer sing throughout the community. If health becomes only the province of the wealthy, that nation has an ominous future. The poor will struggle for equity, and even the wealthy, feeling isolated or disabled or in fear, will stop enjoying their riches.

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means to evaluate both medical treatment and preventive medicine, with the units of measurement usually being drawn from the monetary system. We should keep in mind, however, that successfully promoting good health has intrinsic values and enabling powers that reach far beyond a single year’s budget.

With the world’s national economies in transition from producing natural resources to adding value to resources through manufacturing, and now to the rise of the service economy and information management, the allocations for developing national infrastructures will increasingly shift to investing in the human infrastructure. Only by improving the health and learning opportunities of the next generation can the most valuable infrastructure for a nation’s future be solidly built.

Since the 1950s, health care costs have skyrocketed in most nations. Advances in medical technology have made it possible to treat more and more illnesses and disabilities with increasingly sophisticated equipment, for both diagnostic and therapeutic purposes. Further, the miracles of medicine and surgery can now keep more patients with severe illnesses and injuries alive longer, often into older ages, at much greater cost to the community. As more of these patients survive, more and more persons need to be trained to provide rehabilitation and long-term care for this increasing percentage of the population. Thus, the proportion of the gross national product going into tertiary health care services is steadily increasing in most countries.

Successful health promotion and protection programs can be made available cost-effectively to the entire population. They have the potential to halt this expansion of preventable costs, or at least to slow its progress. Health-promoting prenatal care, for example, can deliver healthier babies, and preventive medicine in infancy and childhood will produce healthier children who can grow to their full potential and learn a full array of cognitive and motor skills. Effective programs to protect children and youth from injury and violence also will generate a healthier work force and lower the frequency of disabled persons needing health care. Introducing healthy lifestyle habits early in childhood, and reinforcing them through young adulthood, will prevent much of the current morbidity and mortality rates due to cardiovascular and respiratory diseases and cancers, which attack adults in their prime middle years. Clearly, keeping adults economically productive up to their retirement should be a goal both for health promotion and for economic development. Finally, as the elderly population in every nation grows, it becomes increasingly important to maximize the health and self-care abilities of retired citizens for as long as possible in their remaining years.
To reach all of these goals, an ounce of prevention is worth a pound of cure. This book will present, “ounce by ounce,” specific preventive interventions that are beneficial, practical, inexpensive, and sustainable. They are currently the most visible signposts on the highway to improve health for all in the twenty-first century.

We know that it is always better to prevent a disease or an external trauma than to treat it after it happens—prevention saves individuals, and their families, from pain, suffering, loss of function, prolonged disability, or premature death. Some prevention programs also save money, depending on the program, the population, the disease, and whether one is considering short-term or long-term community outcomes. For families and for nations, this is a most welcome message in these times of escalating costs of medical care, especially high technology care. The only time when prevention could be more expensive than treatment is when disease or injury is infrequent and moves quickly to death before major expenses are incurred—and this is even more painful for surviving family and friends.

But the argument for prevention cannot—and should not—be made primarily on economic grounds. Even though mortality from ischemic (coronary) heart disease has declined sharply since about 1970 (a 30% to 50% decline in some Westernized countries), the cost of treating each case has actually gone up because new technology has created new diagnostic tests and new therapeutic procedures. In addition, the fact that there is an ever-growing number of cardiologists, makes the overall economic benefit negligible.

And yet, we would not want to roll-back scientific advance or the achievement of a full complement of medical specialists. The justification for prevention is that it reduces suffering, makes disability and its diminishments less common, and keeps death off the family’s doorstep until much later. As the wise professor Geoffrey Rose put it: “It is better to be healthy than ill or dead. That is the beginning and the end of the only real argument for preventive medicine. It is sufficient” (Rose, 1992).

Policymakers and the public alike also should consider that some diseases and disabilities, although preventable, are just not curable by any means—in the 20th century one immediately thinks of AIDS. Such issues as the damage caused by a cerebrovascular accident, an automobile crash that cripples a child, or the liver damage caused by excessive use of alcohol also must be weighed. Policymakers dealing in health issues and health professionals must recognize that prevention is the only “cure” available for such destructive maladies.
DISEASE PREVENTION AND HEALTH PROMOTION

Promoting healthy lifestyles involves action on two fronts: disease prevention and health promotion. While there is much overlap between these efforts, disease prevention usually focuses more on specific kinds of illness and trauma and often relies more on the direct involvement of health professionals. There are a few biologically focused physicians who still claim that disease prevention programs cannot really succeed “because you cannot change people.” This is obviously false: tens of millions of people change their health habits and other lifestyle aspects every year. The clear feasibility and success of prevention efforts have been demonstrated for many health problems in many nations. Consider the nearly 50% dramatic decline in cardiovascular mortality in North America and Western Europe since 1970.

In contrast, health promotion involves both individual and family behaviors—as well as healthy public policies in the community—that protect a person against numerous health threats and elicit a general sense of personal responsibility for maximizing one’s safety, host resistance, vitality, and effective functioning. Health promotion, while often using guidance and motivation from health professionals, depends more heavily on individuals acting to change health behaviors in themselves, their families, and their community, as well as advocating preventive health priorities among policymakers, business, industry, and government. This Handbook lays out critical health problems and the social and behavioral changes needed to resolve them—both by means of health promotion and disease prevention.

THREE LEVELS OF PREVENTION

Epidemiologists have identified three stages of the disease process at which preventive actions can be effective—primary prevention, secondary prevention, and tertiary prevention.

PRIMARY PREVENTION

Primary prevention aims at keeping a disease from ever beginning or a trauma from ever occurring. Examples include immunization, reducing household hazards, motivating abstinence from illegal drugs, and reducing risk factors for heart disease. Primary prevention programs aim to reach the widest possible population group who is or might become at risk for a given health problem.

Health promotion programs are usually at the primary prevention level. Quite often a single behavioral habit will protect against a host of diseases. For example, helping children and youth never to start using tobacco (and adults to
stop smoking) yields a 90% reduction in the risk of lung cancer, a 30% to 40% reduction (depending on the population) in the risk of heart attack, a 90% reduction in the risk of chronic lung disease, reductions in many sites of cancer, a reduction in auto accidents and injuries due to fire, and a reduction in the rates of acute respiratory diseases in young children in the home (Last, 1987).

Avoiding or limiting use of alcohol is another lifestyle choice that promotes health in many ways. Last (1987) lists 76 different biological, psychiatric, and behavioral problems caused or worsened by excessive alcohol use. These range all the way from acute intoxication to depression; suicide; cancers of the head, neck, stomach, large bowel, and liver; cirrhosis; cardiomyopathy; hypertension; depressed gonadal function; ethanol-drug interactions; traumatic injuries (especially when driving automobiles or boats); anemia; and many types of complications of pregnancy and birth defects.

Increasing regular, moderate physical exercise and maintaining proper appropriate eating patterns are other health promoting habits that also have a wide range of benefits, including preventing atherosclerosis, reducing high blood pressure, lowering LDL cholesterol, reducing the risk of adult onset diabetes, and strengthening the cardiorespiratory and musculoskeletal systems.

SECONDARY PREVENTION

Secondary prevention involves the early detection and early intervention against disease before it develops fully. Screening programs are prime examples of secondary prevention efforts, providing that persons who screen positive for a disease or condition receive prompt and effective intervention. Conducting screening without full follow-up wastes money and creates anxiety and frustration in the community.

Some cancer screening seeks to identify malignancies while they are small. In contrast, cervical cancer screening (pap smears) seeks to identify pre-malignant cell changes. Screening for infectious diseases can identify sub-clinical cases needing treatment and also prevent spread to the community. This is especially important to healthy persons who otherwise would be exposed to “a carrier” of disease. Screening, at least at its first level, may not require expensive equipment or laboratory processing. Careful questioning and a focused brief observation

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can reveal many conditions, from nutritional problems to dyspnea to schizophrenia—and many more. This can be done by any trained health professional.

Such measures as wearing auto seat belts do not prevent accidents but clearly reduce the severity of human injury. The continuous use of appropriate antibiotics to treat Hanson’s Disease (leprosy) and tuberculosis reduces the risk that the disease will spread to others and also halts the progression of pathology in the patient. Because these measures keep trauma and disease from becoming more severe after onset, they too are considered by some to constitute secondary prevention.

TERTIARY PREVENTION

Tertiary prevention takes place after a disease or injury has occurred. It seeks not only to prevent deterioration and complications from a disease or injury, but also to rehabilitate and return the patient to as full physical, mental, and social function as possible. This is primarily the work of health professionals, but the public needs to know the potential benefits of tertiary interventions and to advocate giving them an appropriate priority in the light of a community’s full spectrum of health care needs.

THE ACTUAL CAUSES OF DEATH

When the public—and health professionals—think of the causes of death, they think of such things as heart disease, cancer, liver disease, or motor vehicle accidents. These are just final diagnoses, however. What are the true causes that lead to these final outcomes? McGinnis and Foege (1993) have identified the non-genetic factors that increased total mortality in the United States and estimated their contributions to the ten leading mortality diagnoses.

THE TEN “TRUE” LEADING CAUSES OF DEATH

- tobacco use
- inadequate or excessive nutrition (dietary habits)
- inadequate aerobic exercise
- excessive alcohol consumption
- lack of immunization against microbial agents
- exposure to poisons and toxins
- firearms
- risky sexual behaviors
- motor vehicle trauma
- use of illicit drugs

These same ten contributing causes are important risk factors throughout the world, but their relative impact will vary depending on local environments and cultures. Simple epidemiologic study should enable each country to set its own preventive priorities.
The McGinnis and Foege study was based on a wide literature review and consensus estimates of the prevalence of risk factors, proportional attributable risks, and 1990 numbers of deaths by cause in the United States. Of 1,238,000 deaths, approximately 400,000 were attributed to tobacco use; 300,000, to dietary and activity patterns; 100,000, to excess alcohol use; 90,000, to microbial agents; 60,000, to toxic exposures; 35,000, to firearms; 30,000, to sexual behavior; 25,000, to motor vehicles; and 20,000, to illicit-drug use. These proportional mortality rates by cause will differ by culture and geography. The good news is that all of these causes can be reduced by behavioral and social changes.

Low socioeconomic status and inadequate access to medical care also raise mortality, but usually in interaction with the ten social behavioral factors listed above. It is clear that these factors also contribute to long-term morbidity and impaired quality of life, and they also help to raise the costs for medical care astronomically before death closes each case.

**THE NEXT STEP NEEDED TO ADVANCE “HEALTH FOR ALL”**

The causes and contributing risk factors for all the leading mortality and morbidity diagnoses in all nations are well established. Preventive measures to deal with them are also well enough known to be able to initiate programs. As the previous section demonstrates, the role of behavioral change in reducing every one of the above-mentioned major causes of disease and trauma is clear at both the individual and social levels. For the first time in the history of medical sciences, the first priority is not further discoveries in the basic physical and biological sciences, but rather the community-wide application of psychology and other social and behavioral sciences for the purpose of putting well-proven preventive health measures into wider daily use. Many of the discoveries in the behavioral sciences are already being successfully applied to clinical medical and public health problems. Technology dealing with behavior change must be applied to health promotion in many more nations and communities and it must be taught in every school for health professionals. *(Also see Chapters 2 and 12.)*