

ECON 445
Spring 2007
Professor Paul Rothstein

Explanatory Exercises
90 points

We urge you not to leave this assignment to the last minute. To help you with this, here is a deal: return this on or before March 13 and receive 5 bonus points. The official due date is March 20.

Please limit your answers to each question to just a few sentences.

Question 1 (6 points)

Suppose that there are 1,000 voters in your city. A total of 400 are willing to pay up to \$25 each for the construction of a park while the other 600 are willing to pay only \$10. The construction of the park will cost \$12,000, and someone proposes a vote of whether to tax each citizen \$12 in order to finance the park.

What will be the result according to the median voter model? Is this result socially efficient? Explain.

Question 2 (6 points)

Is moral hazard likely to be a bigger problem in the health insurance market or the life insurance market? Explain.

Question 3 (6 points)

Suppose that there are two regions of a state: one where car-theft is high and the other where car-theft is very low. Currently, the state allows insurance companies to charge different car insurance premiums (which include insurance against vehicle theft) based in part on where the driver lives. Suppose the government is considering a policy change that would make it illegal to charge higher premiums to people in high car-theft areas.

Assume all drivers in the state are very risk-averse when it comes to insurance against theft and that the insurance firms offer one rate to all drivers in that state. What kind of equilibrium will result? Who, if anyone, will pay a risk premium? Who will be better off, and who will be worse off? Explain.

Question 4 (6 points)

For each of the following, determine which group would have higher Social Security Wealth (SSW), all other things equal. Explain your answers.

1. male or female
2. born in 1925 or born in 1985
3. single or married
4. low-wage earners or high-wage earners
5. single-earner couples or double-earner couples

Question 5 (6 points)

Suppose that your friend applies for private insurance and becomes angry regarding the number of questions asked on the application. He states that since the primary contribution of insurance companies is to pool the risk of many different individuals, they should care less about the characteristics of any one applicant and more about increasing the number of the patients that they insure. Furthermore, he states that when he had insurance through his employer he hardly had to answer any questions. What do you say?

Question 6: 3 page essay (60 points)

The Surgeon General of the United States is, “America’s chief health educator, giving Americans the best scientific information available on how to improve their health and reduce the risk of illness and injury.” In 1979, 1990, and 2000, the Surgeon General issued reports under the general title, “Healthy People.” These reports survey the state of American health and propose ten year goals for health improvement. It is clear from the reports that “public health” (for our purposes, “the average health of the population”) can be promoted by altering consumption of certain private goods as well as by providing certain public goods. This distinction, while much beloved by economists, is largely absent from discussions of public health by those who seek to promote it.

Attached are the first two chapters from the 1979 report, the full title of which was “Healthy People: The Surgeon General’s Report on Health Promotion and Disease Prevention.” Read it. Then write an essay in which you consider the following issues:

1. According to the report, why should the government focus on preventive activities?
2. Identify two preventive activities that the report says the government should undertake that arguably correct a market failure (i.e., a situation in which the outcome without the government intervention is inefficient). Explain.
3. Identify two preventive activities that the report says the government should undertake that arguably do not correct a market failure. Explain.

Note: this is an essay. You will be graded on organization, grammar, style, word use and logic as well as on how you apply the economic principles we have been discussing. There should be an introduction and a conclusion. There should be numbers on every page. A title is optional.

HEALTHY PEOPLE

The Surgeon General's Report On
Health Promotion And Disease Prevention



HEALTHY PEOPLE

The Surgeon General's Report On
Health Promotion And Disease Prevention

1979

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
WASHINGTON, D.C. 20201

SURGEON GENERAL
OF THE
PUBLIC HEALTH SERVICE

The Honorable Joseph A. Califano, Jr.
Secretary of Health, Education, and Welfare


Dear Mr. Secretary:

I am pleased to transmit herewith the manuscript of the Surgeon General's Report on Health Promotion and Disease Prevention.

I believe this will be an important document for the American people.

Many people and institutions, too numerous to acknowledge, have provided valuable assistance in preparing this report. I would particularly like to express appreciation to Dr. J. Michael McGinnis, Acting Deputy Assistant Secretary for Health (Disease Prevention and Health Promotion) and his staff, and to Dr. David Hamburg, President of the Institute of Medicine, of the National Academy of Sciences, for his leadership in mobilizing the resources of the Institute to provide the accompanying papers which present documentation for the report.

Sincerely yours,


Julius B. Richmond, M.D.
Assistant Secretary for Health and
Surgeon General

July 1979

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SECTION I - TOWARD A HEALTHIER AMERICA

CHAPTER I INTRODUCTION AND SUMMARY

The health of the American people has never been better.

In this century we have witnessed a remarkable reduction in the life-threatening infectious and communicable diseases.

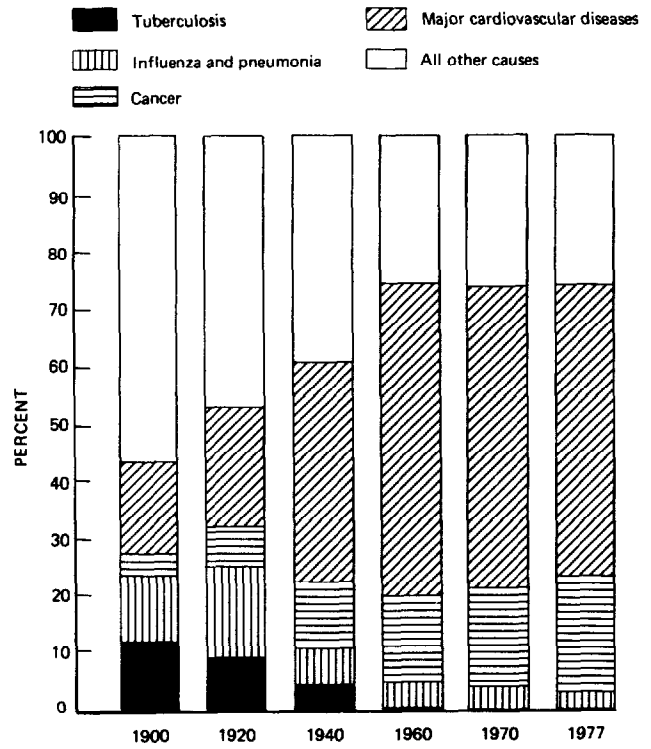
Today, seventy-five percent of all deaths in this country are due to degenerative diseases such as heart disease, stroke and cancer (Figure 1-A). Accidents rank as the most frequent cause of death from age one until the early forties. Environmental hazards and behavioral factors also exact an unnecessarily high toll on the health of our people. But we have gained important insights into the prevention of these problems as well.

It is the thesis of this report that further improvements in the health of the American people can and will be achieved--not alone through increased medical care and greater health expenditures--but through a renewed national commitment to efforts designed to prevent disease and to promote health. This report is presented as a guide to insure even greater health for the American people and an improved quality of life for themselves, their children and their children's children.

Americans Today are Healthier Than Ever

Since 1900, the death rate in the United States has been reduced from 17 per 1,000 persons per year to less than nine per 1,000 (Figure 1-B). If mortality rates for certain diseases prevailed today as they did at the turn of the century, almost 400,000 Americans would lose their lives this year to tuberculosis, almost 300,000 to gastroenteritis, 80,000 to diphtheria, and 55,000 to poliomyelitis. Instead, the toll of all four diseases will be less than 10,000 lives.

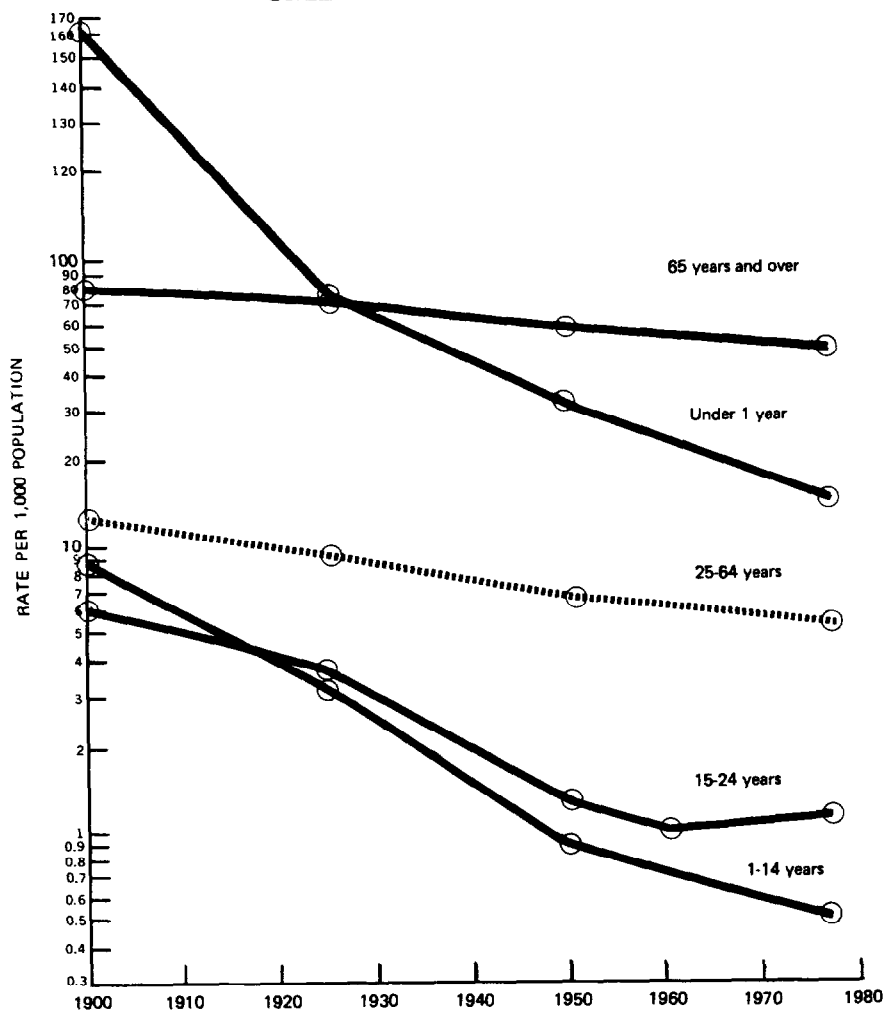
FIGURE 1-A
DEATHS FOR SELECTED CAUSES AS A PERCENT
OF ALL DEATHS: UNITED STATES,
SELECTED YEARS, 1900-1977



NOTE: 1977 data are provisional; data for all other years are final.

Source: National Center for Health Statistics, Division of Vital Statistics

FIGURE 1B
DEATH RATES BY AGE: UNITED STATES,
SELECTED YEARS 1900-1977



NOTE: 1977 data are provisional, data for all other years are final. Selected years are 1900, 1925, 1950, 1960 (for age group 15-24 years only), and 1977.

SOURCE: National Center for Health Statistics, Division of Vital Statistics.

We have seen other impressive gains in health status in the past few years.

- In 1977, a record low of 14 infant deaths per 1,000 live births was achieved.
- Between 1960 and 1975, the difference in infant mortality rates for nonwhites and whites has cut in half.
- Between 1950 and 1977, the mortality rate for children aged one to 14 was halved.
- A baby born in this country today can be expected to live more than 73 years on average, while a baby born in 1900 could be expected to live only 47 years.
- Deaths due to heart disease decreased in the United States by 22 percent between 1968 and 1977.
- During the past decade the expected life span for Americans has increased by 2.7 years. In the previous decade it increased by only one year.

For this, much of the credit must go to earlier efforts at prevention, based on new knowledge which we have obtained through research. Nearly all the gains against the once-great killers--which also included typhoid fever, smallpox, and plague--have come as the result of improvements in sanitation, housing, nutrition, and immunization. These are all important to disease prevention.

But some of the recent gains are due to measures people have taken to help themselves--changes in lifestyles resulting from a growing awareness of the impact of certain habits on health.

Can We Do Better?

To be sure, as a Nation we have been expending large amounts of money for health care.

- From 1960 to 1978 our total spending as a Nation for health care mushroomed from \$27 billion to \$192 billion.
- In 1960 we spent less than six percent of our GNP on health care. Today, the total is about nine percent. Almost 11 cents of every federal dollar goes to health expenditures.
- In the years from 1960 to 1978 annual health expenditures increased over 700 percent.

Yet, our 700 percent increase in health spending has not yielded the striking improvements over the last 20 years that we might have hoped for. To a great extent these increased expenditures have been directed to treatment of disease and disability, rather than prevention.

Though, particularly in recent years, we have made strides in prevention, much is yet to be accomplished.

For example, recent figures indicate that we still lag behind several other industrial nations in the health status of our citizens:

- 12 others do better in preventing deaths from cancer;
- 26 others have a lower death rate from circulatory disease;
- 11 others do a better job of keeping babies alive in the first year of life; and
- 14 others have a higher level of life expectancy for men and six others have a higher level for women.

Prevention - An Idea Whose Time Has Come

Clearly, the American people are deeply interested in improving their health. The increased

attention now being paid to exercise, nutrition, environmental health and occupational safety testify to their interest and concern with health promotion and disease prevention.

The linked concepts of disease prevention and health promotion are certainly not novel. Ancient Chinese texts discussed ways of life to maintain good health--and in classical Greece, the followers of the gods of medicine associated the healing arts not only with the god Aesculapius but with his two daughters, Panacea and Hygeia. While Panacea was involved with medication of the sick, her sister Hygeia was concerned with living wisely and preserving health.

In the modern era, there have been periodic surges of interest leading to major advances in prevention. The sanitary reforms of the latter half of the 19th century and the introduction of effective vaccines in the middle of the 20th century are two examples.

But, during the 1950s and 1960s, concern with the treatment of chronic diseases and lack of knowledge about their causes resulted in a decline in emphasis on prevention.

Now, however, with the growing understanding of causes and risk factors for chronic diseases, the 1980s present new opportunities for major gains.

Prevention is an idea whose time has come. We have the scientific knowledge to begin to formulate recommendations for improved health. And, although the degenerative diseases differ from their infectious disease predecessors in having more--and more complex--causes, it is now clear that many are preventable.

Challenges for Prevention

We are now able to identify some of the major risk factors responsible for most of the premature morbidity and mortality in this country.

Cigarette Smoking

Cigarette smoking is the single most preventable cause of death. It is clear that cigarette smoking causes most cases of lung cancer--and that fact is underscored by a consistent decline in death rates from lung cancer for former male cigarette smokers who have abstained for 10 years or more.

Cigarette smoking is now also identified as a major factor increasing risk for heart attacks. Even in the absence of other important risk factors for heart disease--such as high blood pressure and elevated serum cholesterol--smoking nearly doubles the risk of heart attack for men.

Though the actual cause of the unprecedented decline in heart disease in the last ten years is not entirely understood, it is noteworthy that the prevalence of these three risk factors also declined nationally during this same period.

Alcohol and Drugs

Misuse of alcohol and drugs exacts a substantial toll of premature death, illness, and disability.

Alcohol is a factor in more than 10 percent of all deaths in the United States. The proportion of heavy drinkers in the population grew substantially in the 1960s, to reach the highest recorded level since 1850.

Of particular concern is the growth in use of both alcohol and drugs among the Nation's youth.

Problems resulting from these trends are substantial--but preventable. Our ability to deal with them depends, in many ways, more on our skills in mobilizing individuals and groups working together in the schools and communities, than on the efforts of the health care system.

Occupational Risks

Also more widely recognized as threats to health are certain occupational hazards. In fact, it is now estimated that up to 20 percent of total cancer mortality may be associated with these hazards. The true dimensions of the asbestos hazard, for example, have become manifest only after a latency period of perhaps 30 years.

And rubber and plastic workers, as well as workers in some coke oven jobs, are exhibiting significantly higher cancer rates than the general population.

Yet, once these occupational hazards are defined, they can be controlled. Safer materials may be substituted; manufacturing processes may be changed to prevent release of offending agents; hazardous materials can be isolated in enclosures; exhaust methods and other engineering techniques may be used to control the source; special clothing and other protective devices may be used; and efforts can be made to educate and motivate workers and managers to comply with safety procedures.

Injuries

Injuries represent still another area in which the toll of human life is great.

Accidents account for roughly 50 percent of the fatalities for individuals between the ages of 15 to 24. But the highest death rate for accidents occurs among the elderly, whose risk of fatal injury is nearly double that of adolescents and young adults.

In 1977, highway accidents killed 49,000 people and led to 1,800,000 disabling injuries. In 1977, firearms claimed 32,000 lives, and were second only to motor vehicles as a cause of fatal injury.

Falls, burns, poisoning, adverse drug reactions and recreational accidents all accounted for a significant share of accident-related deaths.

Again, the potential to reduce these tragic and avoidable deaths lies less with improved medical care than with better Federal, State, and local actions to foster more careful behavior, and provide safer environments.

Smoking, occupational hazards, alcohol and drug abuse, and injuries are examples of the prominent challenges to prevention, and there are many others.

But the clear message is that much of today's premature death and disability can be avoided.

And the effort need not require vast expenditures of dollars. In fact, modest expenditures can yield high dividends in terms of both lives saved and improvement in the quality of life for our citizens.

A Reordering of our Health Priorities

In 1974, the Government of Canada published A New Perspective on the Health of Canadians. It introduced a useful concept which views all causes of death and disease as having four contributing elements:

- inadequacies in the existing health care system;
- behavioral factors or unhealthy lifestyles;
- environmental hazards; and
- human biological factors.

Using that framework, a group of American experts developed a method for assessing the relative contributions of each of the elements to many health problems. Analysis in which the method was applied to the 10 leading causes of death in 1976 suggests that perhaps as much as half of U.S. mortality in 1976 was due to unhealthy behavior or lifestyle; 20 percent to environmental factors; 20 percent to human biological factors; and only 10 percent to inadequacies in health care.

Even though these data are approximations, the implications are important. Lifestyle factors should be amenable to change by individuals who understand and are given support in their attempts to change. Many environmental factors can be altered at relatively low costs. Inadequacies in disease treatment should be correctable within the limits of technology and resources as they are identified. Even some biological factors (e.g., genetic disorders) currently beyond effective influence may ultimately yield to scientific discovery. There is cause to believe that further gains can be anticipated.

The larger implication of this analysis is that we need to re-examine our priorities for national health spending.

Currently only four percent of the Federal health dollar is specifically identified for prevention related activities. Yet, it is clear that improvement in the health status of our citizens will not be made predominately through the treatment of disease but rather through its prevention.

This is recognized in the growing consensus about the need for, and value of, disease prevention and health promotion.

Several recent conferences at the national level have been devoted to exploring the opportunities in prevention. Professional organizations in the health sector are re-evaluating the role of prevention in their work.

The President and the Secretary of Health, Education, and Welfare have made strong public endorsements of prevention. And a rapidly growing interest has emerged in the Congress.

The Federal interest is paralleled by great interest in the State health agencies.

There are three overwhelming reasons why a new, strong emphasis on prevention--at all levels of governments and by all our citizens--is essential.

First, prevention saves lives.

Second, prevention improves the quality of life.

Finally, it can save dollars in the long run. In an era of runaway health costs, preventive action for health is cost-effective.

Prevention - A Renewed Commitment

In 1964, a Surgeon's General's Report on Smoking and Health was issued. This report pointed to the critical link between cigarette smoking and several fatal or disabling diseases. In 1979, another report was issued based on the knowledge gained from over 24,000 new scientific studies--studies which revealed that smoking is even more dangerous than initially supposed.

In recent years, our knowledge of important prevention measures in other critical areas of health and disease has also increased manyfold.

This, the first Surgeon General's Report on Health Promotion and Disease Prevention, is far broader in scope than the earlier Surgeon General's reports.

It is the product of a comprehensive review of prevention activities by participants from both the public and private sectors. The process has involved scientists, educators, public officials, business and labor representatives, voluntary organizations, and many others.

Preparation of the report was a cooperative effort of the health agencies of the Department of Health, Education, and Welfare, aided by papers from the National Academy of Sciences' Institute of Medicine and the 1978 Departmental Task Force on Disease Prevention and Health Promotion. Core papers from both documents are available separately as background papers to this report.

The report's central theme is that the health of this Nation's citizens can be significantly improved through actions individuals can take themselves, and through actions decision makers in the public and private sector can take to promote a safer and healthier environment for all Americans at home, at work and at play.

For the individual often only modest lifestyle changes are needed to substantially reduce risk for several diseases. And many of the personal decisions required to reduce risk for one disease can reduce it for others.

Within the practical grasp of most Americans are simple measures to enhance the prospects of good health, including:

- elimination of cigarette smoking;
- reduction of alcohol misuse;
- moderate dietary changes to reduce intake of excess calories, fat, salt and sugar;
- moderate exercise;
- periodic screening (at intervals determined by age and sex) for major disorders such as high blood pressure and certain cancers; and
- adherence to speed laws and use of seat belts.

Widespread adoption of these practices could go far to improve the health of our citizens.

Additionally, it is important to emphasize that physical health and mental health are often linked. Both are enhanced through the maintenance of strong family ties, the assistance of supportive friends, and the use of community support systems.

For decision makers in the public and private sector, a recognition of the relationship between

health and the physical environment can lead to actions that can greatly reduce the morbidity and mortality caused by accidents, air, water and food contamination, radiation exposure, excessive noise, occupational hazards, dangerous consumer products and unsafe highway design.

The opportunities are, therefore, great. But if those opportunities are to be captured we must be focused in our efforts.

An important purpose of this report is to enhance both individual and national perspective on prevention through identification of priorities and specification of measurable goals.

Americans have a deep interest in improving their health. This report is offered to help them achieve that goal.

CHAPTER 2 RISKS TO GOOD HEALTH

Disease and disability are not inevitable events to be experienced equally by all.

Each of us at birth--because of heredity, socioeconomic background of parents, or prenatal exposure--may have some chance of developing a health problem.

But, throughout life, probabilities change depending upon individual experience with risk factors--the environmental and behavioral influences capable of provoking ill health with or without previous predisposition.

Most serious illnesses--such as heart disease and cancer--are related to several factors. And some risk factors--among them, cigarette smoking, poor dietary habits, severe emotional stress--increase probabilities for several illnesses.

Moreover, synergism operates. The combined potential for harm of many risk factors is more than the sum of their individual potentials. They interact, reinforce, even multiply each other.

Asbestos workers, for example, have increased lung cancer risk. Asbestos workers who smoke have 30 times more risk than co-workers who do not smoke--and 90 times more than people who neither smoke nor work with asbestos.

It is the controllability of many risks--and, often, the significance of controlling even only a few--that lies at the heart of disease prevention and health promotion.

Major Risk Categories

Inherited Biological

Heredity determines basic biological characteristics and these may be of a nature to increase risk for certain diseases. Heredity plays a part in susceptibility to some mental disorders, infectious diseases, and common chronic diseases such as certain cancers, heart disease, lung disease, and diabetes--in addition to disorders more generally recognized as inherited, such as hemophilia and sickle cell anemia.

Actually, however, disease usually results from an interaction between genetic endowment and the individual's total environment. And although the relative contributions vary from disease to disease, major risk factors for the common chronic diseases are environmental and behavioral--and, therefore, amenable to change. Even familial tendencies toward disease may be explained in part by similarities of environmental and behavioral factors within a family.

Environmental

Evidence is increasing that onset of ill health is strongly linked to influences in physical, social, economic and family environments.

Influences in the physical environment that increase risk include contamination of air, water, and food; workplace hazards; radiation exposure; excessive noise; dangerous consumer products; and unsafe highway design.

Over the past 100 years, man has markedly altered the physical environment. While many changes reflect important progress, new health hazards have come in their wake. The environment has become host to many thousands of synthetic chemicals, with new ones being introduced at an annual rate of about 1,000--and to byproducts of transportation, manufacturing, agriculture and energy production processes.

Factors in the socioeconomic environment which affect health include income level, housing, and employment status. For many reasons, the poor face more and different health risks than people in higher income groups: inadequate medical care with too few preventive services; more hazardous physical environment; greater stress; less education; more unemployment or unsatisfying job frustration; and income inadequate for good nutrition, safe housing, and other basic needs.

Family relationships also constitute an important environmental component for health. Drastic alterations may occur in family circumstances as spouses die or separate, children leave home, or an elderly parent moves in. An abrupt major change in social dynamics can create emotional stress severe enough to trigger serious physical illness or even death. On the other hand, loving family support can contribute to mental and physical well-being and provide a stable, nurturing atmosphere within which children can grow and develop in a healthy manner.

Behavioral

Personal habits play critical roles in the development of many serious diseases and in injuries from violence and automobile accidents.

Many of today's most pressing health problems are related to excesses--of smoking, drinking, faulty nutrition, overuse of medications, fast driving, and relentless pressure to achieve.

In fact, of the 10 leading causes of death in the United States (Figure 2-A), at least seven could be substantially reduced if persons at risk improved just five habits: diet, smoking, lack of exercise, alcohol abuse, and use of antihypertensive medication.

Risk Variability

Because risk factors interact in different ways, population groups which differ because of geographic

Figure 2-A
Causes of Death by Life Stages, 1977

PROBLEM	AGE GROUPS													
	Infants (Under 1)		Children (1-14)		Adolescents/ Young Adults (15-24)		Adults (25-44)		Adults (45-64)		Older Adults (Over 65)		Total Population (all ages)	
	Rank	Rate ¹	Rank	Rate ²	Rank	Rate ²	Rank	Rate ²	Rank	Rate ²	Rank	Rate ²	Rank	Rate ²
Chronic Diseases														
Heart Disease			7	1.1	6	2.5	2	25.5	1	351.0	1	2334.1	1	332.3
Stroke			8	.6	9	1.2	8	6.1	3	52.4	3	658.2	3	84.1
Arteriosclerosis											5	118.5	9	13.3
Bronchitis, Emphysema, & Asthma										10	12.2	8	69.3	
Cancer			3	4.9	5	6.5	1	29.7	2	302.7	2	988.5	2	178.7
Diabetes Mellitus					10	.4	10	2.4	8	17.8	6	100.5	7	15.2
Cirrhosis of the Liver							7	8.8	4	39.2	9	36.7	8	14.3
Infectious Diseases														
Influenza and Pneumonia	5	50.6	6	1.5	8	1.3	9	3.0	9	15.3	4	169.7	5	23.7
Meningitis			8	.6										
Septicemia	6	32.7												
Trauma														
Accidents														
Motor vehicle accidents			2	9.0	1	44.1	3	23.1	7	18.3	10	24.5	6	22.9
All other accidents	7	27.7	1	10.8	2	18.4	4	18.5	5	25.5	7	78.1	4	24.8
Suicide			10	.4	3	13.6	5	17.3	6	19.1			9	13.3
Homicide			5	1.6	4	12.7	6	15.8						
Developmental Problems														
Immaturity associated	1	407.7												
Birth-associated	2	294.4												
Congenital birth defects	3	253.1	4	3.6	7	1.6								
Sudden infant deaths	4	142.8												
All causes		1412.1		43.1		117.1		182.5		1,000.0		5288.1		878.1

¹Rate per 100,000 live births.

²Rate per 100,000 population in specified group.

location, age, and/or socioeconomic strata can experience substantial variability in disease incidence. And investigations of the variability can provide important clues about the extent to which major causes of disease and death may be preventable.

Contrasts between different groups within the United States will be discussed throughout Section II. Here, it is interesting to note some of the striking influences which international variations in habits and environs can have.

For example, an American man, compared to a Japanese man of the same age, is at 1.5 times higher risk of death from all causes, five times higher for death from heart disease, and four times higher for death from lung cancer. And for breast cancer, the death rate for American women is four times as great as for Japanese women. On the other hand, a Japanese man is eight times as likely to die from stomach cancer as his American counterpart. Other Western countries such as England and Wales, Sweden, and Canada have experiences generally paralleling our own although rates vary somewhat from country to country.

The importance of environment and cultural habits, rather than heredity alone, is suggested by studies of Japanese citizens who have moved to the United States. They indicate that, with respect to cardiovascular disease and cancer, families who migrate tend to assume the disease patterns of their adopted country.

Age-Related Risks

From infancy to old age, staying healthy is an ever-changing task. The diseases that affect young children are not, for the most part, major problems for adolescents. From adolescence through early adulthood, accidents and violence take the largest toll. And these are superseded a few decades later by chronic illness--heart disease, stroke and cancer. Figure 2-A depicts major causes of death by life stages.

In one respect, this age orientation is misleading. Although heart disease, stroke, and cancer are commonly regarded as adult health problems, their roots--and, indeed, the roots of many adult chronic diseases--may be found in early life. Early eating patterns, exercise habits, and exposure to cancer-causing substances all can affect the likelihood of developing disease many years later. Some studies have found high blood pressure and high blood levels of cholesterol in many American children. The presence of two such potent risk factors for heart disease and stroke at early ages point to the need to regard health promotion and disease prevention as lifelong concerns.

At each stage of life, different steps can be taken to maximize well-being--and the health goals described in the next section deal with the major health problems of each group.*

Assessing Risk

Risk estimates are derived by comparing the frequency of deaths, illnesses or injuries from a specific cause in a group having some specific trait or risk factor, with the frequency in another group not having that trait, or in the population as a whole.

Some diseases may occur more frequently in a small population group--for example, a rare type of liver cancer among workers handling vinyl chloride. Such a high risk group, of course, is not difficult to identify although many deaths may occur before the disease cause is clearly established.

* The Nation's leading health problems are not only those which cause death. Other significant conditions--such as mental illness, arthritis, learning disorders, and childhood infectious diseases--provoke considerable sickness, disability, suffering, and economic loss. These problems are considered in this report--but, for overview purposes, the leading causes of death provide useful indications of some of the prominent risk factors faced by each age group.

But increases in more common diseases not confined to isolated population groups may be much more difficult to attribute to a specific cause. For example, after cigarette smoking was widely adopted, lung cancer rates began to increase dramatically, not immediately but after about a 20-year interval. Because of the large numbers of diverse people and the long interval involved, many theories had to be considered before the direct link between cigarette smoking and lung cancer was firmly established.

The presence of a risk factor need not inevitably presage disease or death. But those events can arise from the cumulative effect of adverse impacts on health. The chain of events may be short, as in a highway accident, or long and complex, as in the development of coronary artery disease and the heart attack which may follow.

Some diseases may involve a single significant risk, such as lack of immunization. Others involve many contributing factors. Those associated with coronary artery disease, for example, include heredity, diet, smoking, uncontrolled hypertension, overweight, lack of exercise, stress, and possibly other unknown factors.

The Role of the Individual

Because there are limits to what medical care can presently do for those already sick or injured, people clearly need to make a greater effort to reduce their risk of incurring avoidable diseases and injuries.

This is not to suggest that individuals have complete control and are totally responsible for their own health status. For example, although socioeconomic factors are powerful determinants, individuals have limited control over them. Nor can they readily decrease many environmental risks. The role of the individual in bringing about environmental change is usually restricted to that of the concerned citizen applying pressure at key points in the system or process. But the individual must rely

in large part on the efforts of public health officials and others to reduce hazards.

People must make personal lifestyle choices, too, in the context of a society that glamorizes many hazardous behaviors through advertising and the mass media. Moreover, our society continues to support industries producing unhealthful products, enacts and enforces unevenly laws against behaviors such as driving while intoxicated, and offers ambiguous messages about the kinds of behavior that are advisable.

Finally, although people can take many actions to reduce risk of disease and injury through changes in personal behavior, the health consequences are seldom visible in the short run. Even when the individual knows that a habit such as eating excessive amounts of high-calorie, fatty food is not good, available options may be limited. And some habits such as alcohol abuse and smoking may have become addictive.

To imply, therefore, that personal behavior choices are entirely within the power of the individual is misleading. Yet, even awareness of risk factors difficult or impossible to change may prompt people to make an extra effort to reduce risks more directly under their control and thus lessen overall risk of disease and injury. Healthy behavior, including judicious use of preventive health care services, is a significant area of individual responsibility for both personal and family health.

The following sections of this report will clarify the role of various risk factors in disease and disability.