

Institute for Alternative Futures
Foresight Seminars on Health and Innovation

SUMMARY

FORESIGHT SEMINAR ON NATIONAL RESEARCH POLICY
AND RESEARCH INTO THE CONDITIONS OF AGING
June 13, 1983

ABSTRACT

Because of projected increases in the elderly population, major questions arise about the future biological, social and behavioral consequences of aging. Research into the conditions of aging may affect the rate of aging, the health of the elderly, and the ability of the health care system to afford care to the aging population. Disagreement exists over which research approach offers the most promise for the future, but there is agreement that present trends are leading to growing problems. More resources will need to be devoted to illnesses that afflict the elderly in particular. If these diseases are not prevented or cured, then it will be necessary to expand the capacity of the health care system to cope with an increasing demand for long-term care.

The demand for long-term care will depend largely on two factors: the pattern of mortality and the burden of chronic diseases within the elderly population. If the average life expectancy is approaching the maximum life span of our species, then there will be an increasing rectangularization of the survival curve. This implies that the best strategy may be to focus resources on prevention to delay the onset of chronic disease. It may be possible to prevent disability from chronic conditions until close to, or beyond, the age when death comes naturally.

However, if the increasing life expectancy is not approaching a limit, so the survival curve continues to rise, a different result may occur. Prevention then may delay chronic diseases, but without cures, there will still be an increasing number of people living to older age and facing the need for long-term care. This prospect gives added importance to both basic research and health services research. Basic biomedical research is moving toward the capacity to decisively treat age-related diseases. By studying genetic factors, the immune system, hormones and nutrition, researchers may bring about the cure or prevention of diseases associated with aging.

Health services research also has an important role in seeking to determine the most effective way to treat the largest number of people in an affordable manner. Newly developing technology and creative social thinking on the part of policy makers and researchers can help meet the future health care needs of the elderly. Non-mandatory retirement, deinstitutionalization of long-term care, behavior modification, and health education may all be part of society's way of dealing with these challenges.

BACKGROUND

100 North Pitt Street, Suite235 Alexandria, VA 22314
(703) 684-5880 (703) 684-0640 fax
<http://www.altfutures.com>

Institute for Alternative Futures

Foresight Seminars on Health and Innovation

The June 13 Foresight seminar began with demographic projections for the elderly population and followed with descriptions of three types of research which may affect conditions of the elderly in the future. Dr. Edward L. Schneider, Associate Director for Biomedical Research and Clinical Medicine at the National Institute on Aging, first described some of the basic biological research that offers hope against the diseases which specifically afflict the elderly. Dr. R. Knight Steel, Director of the Gerontology Center of Boston University next discussed health care research aimed at improving the delivery of health care to the increasing elderly population. Then Dr. James F. Fries, Associate Professor of Medicine at Stanford University Medical School described how the patterns of mortality relate to different strategies in health policy, including research based on traditional models and behavioral research which can be linked to the health promotion movement.

EDWARD L. SCHNEIDER, M.D.

SUMMARY STATEMENT

We need both health services and biomedical research, and psychosocial implications must be considered in both. There are going to be so many people in the susceptible age range, 70's, 80's and 90's, that we cannot delay this research any further, and ~ must move with some speed. We must mount a campaign to search for the causes of dependency as well as for effective preventive and therapeutic strategies. We cannot wait until these problems are upon us.

The graying of America has occurred since 1900 when there were 3 million Americans, or four percent of the population, age 65 or older. Today, there are 27 million Americans, 11 percent of the population, in this age category. Depending upon birth rates and patterns of death rates in the next several decades, there could be as many as 15% to 20% of our population, or 65 million Americans, age 65 or older.

Average life expectancy has increased from 45 years in 1900 to almost 78 years for women and 71 years for men in 1983. Factors contributing to this phenomenon include: improved public health measures, the conquest of many infectious diseases and, most recently, decreasing illness and death from heart attacks and strokes.

The most rapidly growing age-group in this country are those age 85 and above; this group will triple in size over the next 50 years. Today these individuals comprise .8% of the population, yet 21% of them reside in nursing homes. As their number increases, health care costs for those 85 and above will place an enormous strain on our health care system.

The challenge of research on the aging will be to diminish the impact of chronic diseases by extending the healthy middle and later years of life. There has been significant support for aging research only within the last 10 years; therefore, research is still in its inceptive stages--primarily making observations of what occurs within aging. We are presently

Institute for Alternative Futures

Foresight Seminars on Health and Innovation

witnessing the first stages of the mechanistic phase of research, in which we learn to understand the mechanisms of aging. We are working toward the intervention stage, ultimately, in which we will effectively prevent and/or delay diseases and disorders related to aging.

Aging research covers biomedical, behavioral and social research. Biomedical research includes basic research into the nature of aging processes as well as applied research related to specific age-related diseases and disorders. Our increasing knowledge indicates that aging is the sum of many genetic and environmental factors. The genetic contribution to the life span is obvious. Our life span is 30 times greater than certain other mammalian species regardless of the environment and 1,000 times longer than certain other organisms. According to Roy Wallboard of UCLA, single gene changes can significantly extend the life span of inbred mouse strains. The advent of powerful new genetic techniques will allow us to identify genes responsible for aging and enable us to understand how they work.

Another area for potential intervention is the immune system, which combats and destroys foreign substances such as bacteria and viruses. While we have substantially eliminated infectious disease as a cause of death in the younger population, it is still a problem for older age groups. Since 1900, there has been a 96% decline in deaths due to infectious diseases in 1 to 4 year olds, while only a 37% decline in those 65 to 74 years old. Today, infectious diseases such as influenza and pneumonia are the fourth leading cause of death for those age 65 and older. There is a significant decline in a number of immune functions which accompany aging and this reduces the ability to combat infectious diseases. For example, the thymus gland produces hormones that enable white blood cells to combat viruses and bacteria. It reaches maximum size at age 12 and decreases in size until at 50 to 60 years of age, it is barely visible at surgery. Researchers are attempting to determine which thymic hormones are related to immune functions that decline with age. A strategy may be to replace selected hormones to rejuvenate immune functions. This could prevent particular infectious diseases in the highly susceptible elderly population.

Another important area of research has related nutrition to the onset of osteoporosis, which is a particularly common and tragic condition for elderly women. As aging occurs, the ability of the skin to make vitamin D through the action of sunlight decreases and the liver and kidney decline in their ability to convert Vitamin D to its active form. Vitamin D in the active form directly affects bone thickness, and as the amount of the vitamin decreases, so does bone thickness. This causes the hip bone to become weaker and more susceptible to injury. While the threat of skin cancer has induced many elderly people to avoid exposure to large amounts of sunshine, and fears of cholesterol have led to less intake of vitamin D fortified milk, these threats may need to be balanced with the increased needs of elderly women for vitamin D.

Investigators are also exploring a number of other avenues into the causes of chronic diseases. Alzheimer's disease, which is one of the most frightening and debilitating of chronic conditions, affects 1 to 2 million people, most of whom are elderly. It is being

Institute for Alternative Futures
Foresight Seminars on Health and Innovation

approached from different research directions. One promising area is in the field of brain research where investigators recently found that the amount of a certain brain chemical, acetylcholine, is decreased in the brains of Alzheimer's patients. This finding opens the avenue for interventions, including the future possibility of transplanting brain cells that could produce this chemical. Two percent of the population aged 65 have Alzheimer's disease, while 20% of those 85 years of age suffer from it, so research now being done may have a tremendous impact as society ages.

R. KNIGHT STEEL, M.D.

SUMMARY STATEMENT

There should be no conflict between health services research and biomedical research. Health services research is necessary to utilize the limited resources we have to care for the population in a humane and appropriate manner. We must recognize that wasting resources in the delivery of health care services limits the money available to others, including research scientists.

The recent widespread realization that health care resources are limited has increased interest in health services research. However, health services research deals not just with the cost-effectiveness of health care, but also with quality of life issues. Research into cost alone is inadequate because the cheapest tack may not be the best for the patient or the patient's family. The quality of life issues are as important as they are difficult to deal with; they provide a measure of how our nation treats its elderly.

Two major forces affecting health care delivery today are the explosion of need generated by an increase in the number of elderly, and the surge of new technology. These forces raise two questions: 1.) Can health services for the elderly be provided in a less expensive manner without losing the quality of that care? and, 2.) Can we devise a means of assessing technology so as to not only control cost but also deliver more effective care?

These are important public questions because health care for the elderly is a growing government cost. There are about 1 million acute hospital beds in the United States. Taking the Boston University Medical Center as an example, the acute beds there are occupied about 50% of the time by persons 65 years of age or older. These people stay in the hospital longer and therefore use a disproportionate amount of resources, even allowing for their high admission rate. Their care is predominantly paid by Medicare.

Long-term beds, on the other hand, are paid for predominantly by Medicaid, and about 90% of the 1.4 million long-term care beds in the U.S. are occupied by the elderly. Approximately one-in-five Americans will pass through a long-term care facility at some time in his/her life and this care is very expensive. Problems arise because the Medicare and Medicaid programs are not coordinated; a slight saving in one program may be flaunted as a victory even when it results in greater costs to the other program. The time is past due for coordination, and perhaps pooling, of major resources for health care. There

Institute for Alternative Futures

Foresight Seminars on Health and Innovation

are patients who received unnecessary care at great cost because of the totally unharmonious relationship between Medicare and Medicaid. Many elderly persons have received poor care as well because of the present system.

While correcting inefficiencies can result in savings of hundreds of millions of dollars, the total financial commitment for long-term care will still rise significantly over the next 25 years. Appropriate institutional care is convenient and cost-effective for delivering multiple services to multiple persons. Some of these services cannot be offered in homes or on an outpatient basis. The demographic characteristics of our population spell out the need for more institutional care; the old old segment of our population, those 75 and over, is growing at the fastest rate of any subgroup of our population.

Along with demographic trends, social characteristics are shaping the need for more institutional long-term care. The elderly segment of the population is fast becoming an isolated group in society. This phenomenon is occurring because most women marry older men and frequently outlive them. They may have an extensive widowhood later in life with few children, frequently males, whom they may also outlive. This leaves them with nowhere to go once a physical or mental disability becomes a prominent feature of their lives. In the future, this phenomenon will be increasingly common and institutional care will be necessary to cope with it. There are two approaches which might be of aid in minimizing the need for institutional care: prepaid, truly comprehensive care for the elderly; and home care. Boston University operates a home care service that successfully demonstrates such care can be delivered reasonably cheaply.

Along with the pressure from a growing population, technology also poses problems for health care. The availability of expensive technology has brought with it a dilemma for the physician. When to make use of what technology in the care of the elderly is not only a societal problem as some have stressed, but also a great problem for the physician wanting to give the best possible care, irrespective of costs. Because data on the merits and hazards of the latest pharmaceuticals and technology are often conflicting or nonexistent, care is frequently expensive and poor in quality.

In a study published in the New England Journal of Medicine in 1981, more than one-third of 815 consecutively admitted patients to a general medical service experienced some ill effects resulting from their hospitalization. This warrants research efforts to minimize such iatrogenic illnesses. A better understanding of the potential hazards and benefits of a drug or a procedure is essential, especially when used in the care of older, sicker patients who have the diminished reserve associated with the phenomenon of aging and a number of chronic illnesses.

Technology assessment should be mandatory within the health care industry and The Institute of Medicine has convened a diverse group to design and seek support for an agency to assess technology. Health services research is trying to address how to make use of new drugs, machines and procedures to maximize the health of the biggest user of health services, the old, in the least expensive way. This must be done while always

Institute for Alternative Futures
Foresight Seminars on Health and Innovation

keeping in mind the fundamental humanitarian and ethical considerations inherent in the health care system.

JAMES F. FRIES, M.D.

SUMMARY STATEMENT

The problems of the aging population and of the aged person calls for a much broader model of disease than we have used before, not just a biomedical model of disease but a psychosocial model of disease. We need research about each of the different aspects which contribute to patient outcomes.

The goal of health policy is to reduce the illness burden of society and this illness burden is moving into the older age group. We have come through different eras in this century; we started in an era of infectious diseases, are moving through an era of chronic diseases, and toward an era when the illness burden is not disease, but decrements in the aging process. As this changes our models of disease, health policy must also change to fit the health needs of the era.

As it confronts change, health policy faces three constraints: it must be politically realistic, financially affordable and biologically possible. The changing pattern of mortality in the United States during this century helps to illustrate what is biologically possible.

There has been a large shift in the median age at which people die: from 47 years of age in 1900 to about 73 years at the present time. The number of people dying before the age of 30 has decreased by 90%. This improvement in life expectancy is described as a rectangularization of the survival curve. This suggests that we can progressively increase the percentage of the population dying near the end of their genetically determined lifespan. This has an approximate mean of 85 years, and lies between the range of 70 and 100 for most individuals.

The rectangularization of the survival curve indicates that the greatest improvements in health can be made in the later years. This is described as "compressing morbidity." To do this means confronting chronic diseases such as arteriosclerosis, osteoarthritis, emphysema, cirrhosis, diabetes, and cancer. In medicine, new models have been developed to describe and understand these diseases as processes that develop over time in the whole population. These chronic diseases show signs of developing as early as age 20, but for a long time they develop asymptotically. When they cross the symptomatic threshold, they become clinically appreciable for the remaining years of life. These diseases are universal; there is an early onset of their embryonic forms in everyone, but they progress differently according to individual differences.

These individual differences are recognized as risk factors in the new model of chronic disease. Rather than single causes and cures for chronic diseases, multiple risk factors are now seen to determine the onset of the symptoms. These include such factors as

Institute for Alternative Futures

Foresight Seminars on Health and Innovation

hypertension, diet, smoking, exercise and alcohol intake. This leads to a new health strategy: postponing the onset of symptoms by reducing risk factors hence, the "compression of morbidity." This approach divides our lives into two parts: the firm part before we contract the first symptoms of chronic disease; and the infirm part. As one postpones the infirm period of one's life, the period of morbidity is decreased, or compressed.

The progress of chronic disease is delayed by manipulating risk factors, such as cigarette smoking. Reducing the number of cigarettes smoked may delay lung cancer, heart disease and emphysema. We may be able to prevent some chronic diseases from becoming disabling before the end of a person's life. From a policy standpoint, the more the period of morbidity is compressed, the less of a burden there is on society.

There are a variety of health problems which can be modified in the population as well as in the individual. Although there are a number of aging markers which it appears we cannot modify, others can be changed. Those we cannot change include the rigidity of an arterial wall, the formation of cataracts, loss of hearing, elasticity of skin, the loss of hair and graying. However, another list of markers offer hope because they do appear to be modifiable within the individual. These include cardiac reserve, dental decay, glucose tolerance, memory, intelligence, osteoporosis, physical endurance and strength, pulmonary reserve and reaction time. These markers of aging have been shown to be responsive to interventions which change performance levels and there is hope that these changes can occur within populations as well as within individuals.

Well controlled, well designed studies have shown that many performance levels relating to the markers of aging can be changed and this leads to the notion of health promotion. The general principle of health promotion appears to be "use it or lose it," which extends throughout many of the human faculties that ~ associate with aging. Intelligence, memory, endurance, sex and physical training all appear to be responsive to conditioning. These are the kinds of things that older persons are most concerned about when they are asked about aging.

For those individuals who survive trauma, the most common illnesses occur in the 60's, 70's and 80's; this is where the illness burden of society lies and where resources and programs should be directed. Some ideas for policy consideration include elimination of mandatory retirement, creative vocations and avocations for the elderly, part-time work programs, enhancement of health at earlier ages, a relative de-institutionalization of long-term care, social stimulation of independence in later life, and the study of cultural, political and social incentives that work adversely on health.

QUESTION AND DISCUSSION

The first question focused upon an apparent disagreement between the speakers regarding the problems of aging versus increasing lifespan. Dr. Schneider, while agreeing with the need to concentrate on modifying risk factors, said that disorders such as Alzheimers

Institute for Alternative Futures

Foresight Seminars on Health and Innovation

disease are going to become a tremendous burden despite such programs; so the primary focus of health research should be to find cures or prevention strategies for chronic diseases. The burden of chronic disease will increase if, as Dr. Schneider believes, the human lifespan is not limited to age 85. He argues that people are now living longer, into their 80's and 90's, and there are 32,000 people in the United States over age 100.

Fries agreed that traditional investigator-sponsored research should be funded, but he argues that extending the present lifespan is not necessarily desirable socially and it certainly isn't imminent. The more constructive policy, according to Fries, is to recognize the limited lifespan and then try to change the factors that subtract from that lifespan. Biomedical research is necessary, but health promotion, behavioral research and behavior reinforcement programs show serious promise in reducing morbidity. This offers the best hope in the face of the aging population which is the greatest health challenge today.

Responding to the question of de-institutionalization, Dr. Steel said that there is an increasingly large number of women who need care and have no families. For them, de-institutionalization does not work. With large numbers of elderly needing complex services, institutions are the most efficient approach, which is why they developed. Dr. Fries visualizes the need for a variety of choices which range from fully independent elderly to those who are fully dependent. But where possible, the preference should be for individuals to be independent. Dr. Steel agrees, but worries that people don't recognize that there is a tremendous problem of growing numbers of people, particularly women, for whom there are no alternatives to institutionalization. Middle aged-women have the tremendous burden of caring for elderly parents while simultaneously responding to many of the other demands which are placed upon them, such as careers and caring for their own families.

Corporate responsibilities and the range of opportunities which accompany them were also discussed. According to Dr. Steel, corporations are becoming aware of the problems of having an increasingly elderly population work for them. As the population ages, the cost for health care rises because the risk of needing health care rises. This will be a growing problem and it is exacerbated by the uncoordinated division between acute care and chronic care within medicine. The aging members of the workforce are likely to recognize that they will face the need for chronic care and this may lead to demands for corporate benefit programs. Dr. Fries suggested that one approach to this dilemma would be to pass legislation which gives a tax credit to corporations for health promotion activity at the corporate level. Fries also stressed his opposition to mandatory retirement and called for creative social thinking on how to develop attractive ways of using the wisdom of accumulated experience of older citizens.

Each of the speakers were asked their views about increasing technology--particularly in the area of prescription and non-prescription drugs. Dr. Schneider responded that patients are receiving too many drugs and that it is a major issue which should be addressed through education. According to Dr. Fries, Americans obtain eight prescriptions per capita, a total of 1.8 billion per year. The elderly get a disproportionately large amount of

Institute for Alternative Futures
Foresight Seminars on Health and Innovation

them. The use of symptomatic medication is on the rise, and this potentially can cause harm to the elderly. He reiterated that consumer education and awareness of a range of potential therapies is essential. Dr. Steel, discussing the dangers of letting individuals decide whether or not to take their own drugs, stated that passing the decision off to the consumer may not be the answer. He cited an example from the United Kingdom, where there are fewer drugs per capita; individuals are not permitted to obtain many drugs on their own there.