AGING AND PUBLIC HEALTH

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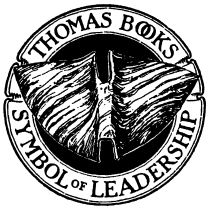
Technology and Demography: Parallel Evolutions

GARI LESNOFF-CARAVAGLIA, Ph.D., Editor



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PREFACE

The presence of an increasing older population occasions the need to reevaluate the meaning of life, death, and the lived experience. Aging does not occur in isolation but is a process that reflects societal attitudes and their practical outcomes. Since such practical responses are principally the purview of public health, this provides the inevitable link between the fields of aging and public health.

As the population continues to age, traditional concerns must expand from physical and biological concerns to incorporate social and behavioral perspectives. Professionals in the fields of aging and public health need to assess the nature of the increased panoply of services that must, perforce, be developed to match the requisites of such a population in a humane and cost-effective manner. Such considerations must take into account not only individual and generational differences, but the diversity resulting from particular groups and subgroups within the aging population. Such heterogeneity represents such factors as geography, disease, disability, and ethnicity.

Provision for persons ranging in ages from 70 to 125 is the challenge that confronts the aging world. Assistance through social and health programming must develop from an underlying understanding of the older population as consisting of individuals with long personal histories, whose needs continue to evolve in the face of the changing circumstances of their lives. Individuals age at differing rates, and their aging may be accommodated, made burdensome, or hastened depending upon the felt obligations and capabilities of a society to assume such responsibilities on their behalf. How one ages, when one ages, and why one ages are reflections of the societal milieu in which the process occurs.

The wide span of biological, psychosocial, environmental, and social influences that impinge on the aging process have particular relevance for a public health perspective on health and social issues in late adult life. In this book, there is systematically developed a significant link between such concerns and a perspective that unites these two fields. Their joint concerns are presented within the context of an examination of the contemporary situation, current needs, and future trends.

The book is further divided into seven sections, each dealing with a particular focus. The sections are preceded by an introductory chapter that provides a broad view of the demographic, mortality, and morbidity trends in an aging world. The manner in which lifestyle and the quality of life are interrelated is given particular attention. The effect of behavioral, social, and environmental risk factors on the morbidity and mortality of older populations lays the groundwork for the chapters that follow.

Section II addresses the biological aspects of aging and public health. Chapter 2 focuses on the life span and life expectancy, normal aging, premature aging, diseases in old age, and sensory loss. It covers the biological and disease aspects of aging and outlines the relationship between normal aging and premature aging brought on by heredity, disease, and environment. Health-risk factors, such as behavioral, social, psychological, and socioenvironmental, are highlighted. The relationship between technological advances and their influences upon lifestyle, life expectancy, and health care are also addressed. Chapter 3 discusses nutrition and older adults by examining food and nutrition recommendations, the physiological and psychological influences on nutritional status, and the socioeconomic and environmental influences on diet. Nutrition is also examined in light of the diversity among older groups and its effects upon health status and the prevalence of disability and disease.

Section III examines the psychosocial aspects of aging and public health. Chapter 4 covers the psychosocial parameters of aging and includes societal attitudes toward aging, the heterogeneity of the aging experience, and behavior and lifestyle as determinants of health. Chapter 5 deals specifically with mental health issues and the aging population covering such factors as gender and sex differences, death and bereavement, and suicide and life-threatening behavior.

Special population groups and public health concerns are the focus in Section IV. Chapter 6 describes the invisible elderly, persons who often fall outside the purview of health providers. Included in these special population groups are victims of family violence and self-neglect, as well as the single-room occupants or persons who withdraw from the mainstream of life and become passive observers of the world. Chapter 7 covers the problems presented by an increasing older prison population. The prison environment as a setting for aging is described, as well as special issues, such as the occurrence of suicide. The special needs and interest of the rural elderly provide the focus for Chapter 8. The access to services for an increasingly diverse, older population presents an additional challenge as does the greater geographic distribution of the older population across urban, suburban, and rural environments.

The prevention that occurs before the onset of disease can be instituted by controlling those environmental and behavioral factors associated with disease conditions. Serious physical injuries can also be controlled by specific prevention strategies. The environment as a significant factor that provides the background for aging is developed in Section V with Chapter 9 focusing on the environment itself, including air quality, communicable-disease control, infections, toxic agents, and food safety. The significant effects of air and water pollution on the older population are clearly delineated. The safety of the older adult population in the community is the theme of Chapter 10. Prevention strategies related to injuries resulting from a variety of sources, such as falls, automobile use, fire, and domestic mishaps, are described.

In Section VI, Chapter 11 examines the linkage between technology and the burgeoning presence of older adults. Attention is given to the potential alteration of environmental conditions, health care, and social services through technological applications. The security issues faced by an aging population are the focus of Chapter 12, including crimes perpetuated against the older population. Social problems that impinge upon the security of the elderly are also highlighted.

The market forces that have changed the structure and character of health care settings during the last decade or so have stimulated the initiation or expansion of a variety of services, including outpatient health services, services specifically for the chronically ill and aged, rehabilitation centers, and long-term-care and terminal-care services. Increased attention is being given to prevention as well as intervention with health-promotion centers established within communities and work sites. In Section VII, Chapter 13 covers the wide array of health services available to the older adult. Although the problems of an aging population are currently being addressed, the approach has been fragmented, inefficient, and uncoordinated. Many older persons still lack adequate care. The responses of public and private agencies to health services for the elderly is delineated, and attention is given to health care planning and the older population. It is patently clear there are methods to mitigate, delay, modify, or even prevent some of the disability associated with aging. The combined effects of interventions by all levels of government, private, and voluntary programs has had both positive and negative effects on the older population and health policies serving the elderly. Attention is also brought to bear on the fact that a public health approach to the study of aging requires an understanding of health and illness in later years, as well as appreciating the fact that the quality of life is an important measure of health status. Particular emphasis is given to the fact that many of the new efforts to address the health needs of an aging society will be based on political and fiscal considerations. The need for a national, public health agenda is accentuated due

to the increasing numbers of older persons, as well as to the increasing diversity among the elderly and broad range of health conditions and disabilities.

The emphasis throughout this book is on the importance of an integration of both public health and aging to foster expanded services to deal with chronic disease and disability, secondary and tertiary prevention, a community orientation, and appropriate interventions for older persons. The health of the general population is now seen as a public concern and is no longer purely a private matter. Such resulting changes in perception derive from the growth of medical sciences and technology, the growing expectations and demands of the public, the escalating costs of health care, and the need to reduce the wide spectrum of barriers to care.

This book is designed to aid professionals and students in understanding the multiple forces that impinge on the health and social status of aging populations. This book is also an invaluable tool for policy makers, researchers, and practitioners in related fields who are interested in the well-being of the elderly.

GARI LESNOFF-CARAVAGLIA, PH.D.

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AGING AND PUBLIC HEALTH

I. INTRODUCTION: ALTERING PERSPECTIVES ON AGING AND PUBLIC HEALTH

Chapter 1

THE AGING WORLD

LAURENCE G. BRANCH

THE WORLD WAS MARKEDLY DIFFERENT at the turn of the twenty-first century from what it was at the turn of the twentieth century. It is estimated that one-half all the people in the history of the world who have reached age sixty-five are alive today. There are myriad reasons for the advances in longevity: improvements in sanitation, an understanding of infectious diseases and germ theory, the discovery of penicillin and the subsequent development of other pharmaceuticals, technological advances in health care delivery in general and the modern hospital in particular, and, more recently, the attention on health promotion and disease prevention.

Let us consider some of the major trends and events of the twentieth century that have markedly influenced the older population as it enters the twenty-first century. An examination of the factors that have shaped society's collective history may provide an understanding of the present and permit predicting the future with greater confidence, if not with increased accuracy.

MAJOR TRENDS IN THE UNITED STATES DURING THE TWENTIETH CENTURY

1900

It was the dawn of the twentieth century. In Europe, Germany was well on its way to implementing industrialization in the work place. Manufactured goods were going to be mass produced. Otto von Bismarck, the Chancellor of Germany during the early era of industrialization, was faced with a new challenge, one never before experienced in the history of the world. Germany was operating at perceived maximum efficiency, but there were younger workers trying to get into the workforce, and there were no more jobs for them. The solution recommended by von Bismarck's economic advisors was indeed radical. The recommendation was to furlough some older workers permanently, to provide them with a lifelong pension and to

hire the new younger workers to replace them. Age sixty-five was recommended as the cutoff for furloughing workers because the economy could afford to provide lifelong pensions to that number of workers, and that number of workers would release enough jobs to allow for the employment of younger workers. It appeared to be an ideal solution. This was the birth of the concept of retirement of able-bodied workers based on age rather than functional ability.

In the preceding millennia, societies of hunters, gatherers, farmers, and guildsmen did not have a parallel for providing pensions to otherwise able workers. In all the previous societies, the hunters, the gatherers, the farmers, the trades workers all worked as long as they could and at the rate or pace that their physical capacities would allow. Their societies did support those unable to work or those whose work was exemplary, but general societal support for those able to work was previously unheard of. Individuals could choose to cease contributing to the production of goods and services in their own society if they so wished (often for reasons of sufficient wealth), but society generally did not provide them a pension.

While Chancellor von Bismark's successors were implementing this new concept of retirement in Germany, in the United States, a White girl infant born in 1900 could expect to live 48.7 years. A White boy infant could expect to live 46.6 years. If the infant was not White, life expectancy was only 33 years. If a woman celebrated a sixty-fifth birthday in 1900, she could expect to live another 12.2 years; men could expect another 11.5 years. In total, there were about 3 million people aged sixty-five and over, representing about 4 percent of the total population.

Most people were not living to a ripe old age but rather were dying from a myriad of preventable diseases. The top three causes of death, accounting for nearly one of three deaths, were infectious diseases, such as pneumonia and influenza (11.7%), tuberculosis (11.3%), and diarrhea and enteritis (8.3%). Only 8.0 percent were dying of heart diseases, and only 3.7 percent were dying of cancers in 1900. Infant mortality was high; childbirth had considerable risk.

1920s–1940s

The success of industrialization in Germany was not wasted on industrialists in the United States. Along with the growth of industrialization came the growth of labor unions. The unions sought among other things to protect the rights of workers, to maximize their wages, to make their working environments safe, to provide them with health insurance, and to provide them with retirement benefits that often included both pensions and retirement health insurance. These benefits came from private sources–employers and employees–unlike the German governmental model.

1930s

A component of the early American dream was shattered. The Great Depression of 1929 provided a lesson to many people that self-reliance on their own resources for a rainy day was insufficient during a deluge. The tragedy of the depression and images of men, women, and children standing in bread lines was seared in the American consciousness. By 1935, the federal government had passed the Social Security Act that signaled the beginning of an era in which the federal government would become involved in social issues and income-transfer programs. The Social Security Act of 1935 established the federal government as the institution providing for unemployment insurance, for disability insurance, and for retirement pensions.

The school teachers in Dallas, Texas, were pleased with the agreement their union forged in 1929 with Baylor Hospital to provide inpatient care to any of its teachers; each teacher paid fifty cents a month for this coverage. This arrangement was the beginning of the Blue Cross & Blue Shield hospital and health insurance system that became a stalwart of health care financing during the latter half of the twentieth century.

1940s and 1950s

The end of the Second World War began another chapter of the American dream. Large numbers of people went to college under the G.I. bill; large numbers of people were able to afford their own homes; large numbers of people bought automobiles for their own use; and large numbers of couples had babies. The Baby Boom that affected so many aspects of American life during the second half of the twentieth century–school systems, labor markets, housing prices–will have an even greater impact during the twenty-first century when all the Baby Boomers retire.

1950s and 1960s

A new problem faced the American dream. Retirees were facing personal bankruptcy because of the costs of hospital care. At the same time, other industrialized societies were deciding that health care was a right of citizenship and began to provide central government funding for health care. Some countries even went so far as to develop central government provision as well as financing of health services. Although there were many debates about national health insurance in the United States, government financing of health care for all citizens was not part of the political consensus. However, solving the hospital-cost problem for older people was, and the Medicare program was passed in 1965 as an addition to the Social Security Act. The federal government would pay for hospital costs under a single program. Medicare, however, was established to solve only the problem of hospital costs for older people, not to provide full health care that included prevention services, ambulatory care, inpatient care, and long-term care. Political consensus in 1965 also produced the Medicaid program as an addition to the Social Security Act intended to finance full health care as just defined to poor people in federal–state partnerships. The year 1965 also saw the passage of the Older Americans Act (OAA) that provided federal financial support to a broad array of community services to older people, including Senior Centers that now dot the nation.

1970s–1990s

Since the implementation of Medicare and Medicaid in 1966, the federal government's share of payments for health care costs more than tripled from 8 percent in 1965 to 27 percent in 1975. In 1980, 1985, and 1990, the federal government's share of health care costs was constant at 29 percent. By 1995, that share had jumped again to 35 percent. The factors contributing to that jump in federal expenditures for health care during the early 1990s were likely the same factors that prompted the then new-President Clinton to attempt a sweeping health care reform during the first year of his term in office. Clinton's health care reform was not passed, and no substantial overhaul of health care delivery or health care financing came from the federal government.

The year 1975 saw the passage of another addition to the Social Security Act, the Home and Community Based Services Act, or often more simply just Title XX. This pro-

gram was important because it facilitated a rash of new policies fostering alternative forms of long-term care to augment the nursing home and the substitution of home and community services for institutional care.

The 1980s and 1990s saw repeated attempts to control health care costs. One strategy was to turn away from paying bills at the usual and customary rates of submitters, and to turn toward composite or bundled services. One of the first of these approaches was to pay all Medicare-participating hospitals essentially the same fee for the same services (with some adjustments based on regions and other factors) regardless of the length of time in the hospital. Another was the renewed interest in managed care, in which the provider of health care agreed to provide all necessary care for the agreed-upon annual amount of payment for the beneficiary. Accepting this payment, also called the annual capitation rate, has the effect of relieving the payer of the responsibility of paying all bills by shifting the responsibility to the provider to provide all care within the capitation amounts.

2000

It is now the twenty-first century, a new millennium. Life expectancy in the United States for a newborn girl is 79.4 years and for a newborn boy is 73.6 years (based on 1997 data presented in the *Health and Aging Chartbook: Health, United States, 1999;* Kramarow, Lentzner, Rooks, Weeks, & Saydah, 1999). Life expectancy for a man just turning sixty-five years of age is 15.9 years; for a woman 19.2 additional years. There are approximately 35 million people past their sixty-fifth birthdays, representing approximately 13 percent of the population. Women are 58 percent of the population aged sixty-five and older and 70 percent of the population aged eighty-five and older. In 1998, about 41 percent of older women were living alone, compared with 17 percent of older men. The current generation of older people has substantially more formal education than previous generations, and the trend will continue. In 1998, approximately one in ten (11%) of older women and one in five (20%) of older men graduated from college. The economic well-being of the older population at the start of the twenty-first century was markedly improved relative to prior generations. In 1959, about 35 percent of the older people lived below the established federal poverty level, whereas in 1998 this was true of only about 11 percent (Federal Interagency Forum on Aging-Related Statistics [FIFAS], 2000).

The causes of death have changed markedly during the twentieth century as well. At the turn of the twenty-first century, deaths caused by infectious diseases had been reduced considerably to 5 percent of all deaths, with pneumonia and influenza accounting for fewer than 4 percent of the deaths and Acquired Immunodeficiency Syndrome (AIDS) fewer than 2 percent. Diseases of the heart account for nearly one of three deaths at 32 percent. Malignant neoplasms (or cancers) account for nearly one in four deaths (23%). Cerebrovascular diseases (notably stroke) account for another 7 percent, and chronic obstructive pulmonary (or lung) diseases account for nearly another 5 percent. Maternal mortality resulting from complications of pregnancy, childbirth, or the puerperium decreased from 83.3 per 100,000 live births in 1950 to 7.1 in 1995.

THE FUNCTIONAL STATUS OF OLDER PEOPLE IN THE UNITED STATES

In addition to these broad and dramatic societal movements and public policy developments of the last century, a myriad of

mysteries continue to cloud society's understanding of the individual older person. For example, why are there two to three older people (we will use the convention of sixty-five years and older for this chapter) living in their homes and communities with the same profile of diseases and disabilities as those living in nursing homes? What leads the one to enter the nursing home and the other two or three to stay in the community? At present, there are no definitive answers to these questions.

Some things about older people are known definitively. At the turn of the twenty-first century, there were approximately 1.6 million nursing home residents in 17,000 nursing homes occupying the 1.8 million licensed nursing home beds available in the United States, compared to 1.1 million licensed hospital beds in 6,000 hospitals. On any given day, there are approximately 5 percent of those aged sixty-five and over in nursing homes, but the rate varies dramatically by age. Only about 1 to 2 percent of those aged 65 to 74 years reside in a nursing home; about 4 to 5 percent of those aged 75 to 84; and about 19 to 20 percent of those aged eighty-five and older. Furthermore, nearly one-half of those aged sixty-five will enter a nursing home sometime during their life (FIFAS, 2000).

Over one-half of the current nursing home residents are eighty-five years of age or older, and three of four are female. In terms of the basic activities of daily living (ADLs) that define the daily components of personal care (bathing, dressing, toileting, transferring from bed to chair, and eating), 8 percent are independent in all five activities, 8 percent are dependent in one, 9 percent dependent in two, 5 percent dependent in three, 24 percent dependent in 4, and 46 percent dependent in all five (Cowles, 1997). About one in five (21%) are able to walk on their own; another 7 percent are bedfast. Nearly one-half (45%) are taking at least one type of psychoactive medication, with one in four (25%) taking an antidepressant (Cowles, 1997).

These older people who are residents of nursing homes and who share these characteristics represent about 5 percent of the population aged sixty-five and older. The characteristics of the community-dwelling older population present a different configuration. Based on the 1995 Medicare Current Beneficiary Survey (Olin, Liu, & Merriman, 1999), 14 percent have three or more ADL limitations, an additional 22 percent have one or two ADL limitations, and over one-half (53%) report difficulty walking that coexists with an ADL or an IADL limitation. (IADL refers to Instrumental Activities of Daily Living: the activities that most people need to do to live independently in the community, such as shopping, food preparation, housekeeping, using the telephone, taking medications, or managing money.)

Some interesting facts emerge from reviewing the circumstances related to the support received by frail elders living in the communities. According to the National Academy on an Aging Society (NAAS, 2000), much of the support is provided by spouses (28% among White elders and 15% among African American elders), but adult children provide the most support (41% among White elders and 42% among African American elders). Adult grandchildren also provide primary informal support (4% among White elders and 10% among African American elders). Other sources of care, which include paid and unpaid caregivers in the home, account for 27 percent of the care for White elders and 33 percent of the care for African American elders. It is also interesting to note that this same report estimated that unpaid caregivers provided care worth an estimated $196 billion in 1992; payments to nursing homes amounted to about one-third that amount (NAAS, 2000).

LIFESTYLES AND QUALITY OF LIFE

In 1990, the Surgeon General of the United States published health objectives for the nation (Healthy People 2000: National Health Promotion and Disease Prevention Objectives, 1990) for the year 2000. The report emphasized those domains most important for enhancing the quality of life of older people, namely, enhanced physical function; avoidance of motor vehicle crashes, fires, falls, fall-related injuries, fractures, and pneumonia-influenza; and attention to dental, hearing, and vision statuses. Notably absent from these domains was cognitive function, not due to lack of importance but rather to a lack of consensus as to how to state a measurable goal. The means to maximizing those domains listed included exercise, immunizations, and access to health services.

The *Healthy People 2000 Objectives* of older people are summarized next. For those aged sixty-five and older, the major overarching objective was the following:

> Reduce to no more than 90 per 1,000 people the proportion of all people aged 65 and older who have difficulty in performing two or more personal care activities, thereby preserving independence. (Baseline in 1984–85 was 111 per 1,000.) (p. 587)

In addition, there were these twelve other key health status objectives targeting older adults:

1. Reduce suicides among White men aged sixty-five and older to no more than 39.2 per 100,000. (Age-adjusted baseline in 1987 was 46.1 per 100,000.)
2. Reduce deaths among people aged seventy and older caused by motor vehicle crashes to no more than 20 per 100,000. (Baseline in 1987 was 22.6 per 100,000.)
3. Reduce deaths among people aged sixty-five through eighty-four from falls and fall-related injuries to no more than 14.4 per 100,000. (Baseline in 1987 was 18 per 100,000.)
4. Reduce deaths among people aged eighty-five and older from falls and fall-related injuries to no more than 105 per 100,000. (Baseline in 1987 was 131.2 per 100,000.)
5. Reduce residential fire deaths among people aged eighty-five and older to no more than 3.3 per 100,000. (Baseline in 1987 was 4.4 per 100,000.)
6. Reduce hip fractures among people aged sixty-five and older so that hospitalizations for this condition are no more than 607 per 100,000. (Baseline in 1987 was 714 per 100,000.)
7. Reduce to no more than 20 percent the proportion of people aged sixty-five and older who have lost all of their natural teeth. (Baseline in 1986 was 36%.)
8. Increase years of healthy life expectancy to at least fourteen years among those aged sixty-five. (Baseline in 1980 was twelve years.)
9. Reduce significant hearing impairment among people aged forty-five and older to a prevalence of no more than 180 per 1,000. (Baseline from 1986–88 was 203 per 1,000.)
10. Reduce significant visual impairment among people aged sixty-five and older to a prevalence of no more than 70 per 1,000. (Baseline from 1986–88 was 87.1 per 1,000.)
11. Reduce epidemic-related pneumonia and influenza deaths among people aged sixty-five and older to no more than 7.3 per 100,000. (Baseline from 1980–87 was 9.1 per 100,000.)

12. Reduce pneumonia-related days of restricted activity among people aged sixty-five and older to thirty-eight days per 100 people. (Baseline in 1987 was forty-eight days.) (p. 125)

In addition, there were four other key risk reduction objectives targeted for the older population:

1. Increase to at least 30 percent among people aged sixty-five and older the proportion who engage regularly, preferable daily, in light to moderate physical activity for at least thirty minutes per day.
2. Reduce to no more than 22 percent among people aged sixty-five and older the proportion who engage in no leisure-time physical activity.
3. Increase both pneumococcal pneumonia and influenza immunizations among people aged sixty-five and older to at least 80 percent.
4. Increase to at least 40 percent the proportion of people aged sixty-five and older who have received as a minimum all the screening and immunization services and at least one of the counseling services appropriate for their age and gender as recommended by the U.S. Preventive Services Task Force. (p. 125)

There were no precise baseline rates available at the time the risk-reduction goals were established.

In the near future, the federal government plans to announce the nation's rate of success in meeting the overall objective, the health status objectives, and risk reduction objectives among those aged sixty-five and older. The quality of life for older people in the twenty-first century may be directly proportional to the success in reaching and exceeding these Year 2000 objectives.

However, some preliminary information is available. Concerning the overarching objective, according to data from the 1994 National Long-Term Care Survey, approximately 111 per 1,000 were dependent in three or more ADLs (their measure included a sixth ADL–walking around inside–added to the original five, and hence this rate reflects dependencies in three of six rather than in two of five as stated in the original objective). Furthermore, this 1994 rate of 111 per 1,000 includes 51 per 1,000 who reside in nursing homes. Apparently, there was very little movement during the first several years after the objective was offered because this 1994 rate of 111 per 1,000 was identical to the 1984–85 baseline rate.

Concerning risk-reduction objective two, in 1995 about one-third (34.4%) of older people in the United States reported a sedentary lifestyle defined as no leisure-time physical activity in the previous two-week interval. This rate is far short of the goal of no more than 22 percent.

Concerning risk-reduction objective three, the three-year average between 1993–95 for report of ever having a pneumococcal vaccination was 30.4 percent for older men and 28.5 percent for older women (once in a lifetime is sufficient). The three-year average between 1993–95 for an annual flu shot was 56.2 percent for men and 53.5 percent for women. Clearly, the 1993–95 rates were considerably short of the national objective of 80 percent.

These are only preliminary assessments taken relatively early during the initiative. There is reason to expect that the rates of compliance with the year 2000 objectives for the older population in the United States will be much closer to the stated targets. The quality of their lives may well depend on it.

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II. BIOLOGICAL ASPECTS OF AGING AND PUBLIC HEALTH

Chapter 2

HEALTH AND AGING

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TWO MAJOR CHANGES that have altered contemporary society are the presence of a large number of older persons throughout the world and the rapid advances in modern technology. Such changes reflect potentially both positive and negative aspects as they affect individuals, society, the notion of community, public health, and lifestyles, in terms of opportunities and responsibilities.

In the United States, the nation's older population is expected to more than double by the year 2050. The composition of that population will be more racially and ethnically diverse than generations before them, thus intensifying the need for flexible and sensitive provision of services at all levels.

At the turn of the twentieth century, life expectancy was approximately forty-nine years, and the median age was 22.9. At the initiation of the twenty-first century, people live a quarter of a century longer, with the life expectancy for women now reaching eighty-three and for men seventy-eight. The number of years persons lived as postparental years in 1940 was seventeen years; it is currently thirty-three years. Married women can expect to live twenty to thirty years with a spouse, whereas in 1800, the expectation was twelve years. Sixty-eight percent of all women are widows at age seventy-five. Women, also, make up two-thirds of the population over the age of seventy-five, and it is likely that such age disparity between the sexes will continue (Lesnoff-Caravaglia, 2000).

Older persons play significant roles in all areas of human experiencing, in the work place, in the home, and as prominent experts in a wide range of professional fields. Many persons, although advanced in age, do not internalize a different self-image, nor do they regard themselves as "old" in the sense of being antiquated or superceded by younger persons with respect to acumen or capabilities. As the population continues to age, older persons are found to be involved in all aspects of life—both the positive and the negative. Prominent world figures of venerable age have included the Pope, heads of state, heads of the mafia and other criminal organizations, and Justices of the U.S. Supreme Court.

PROFILE OF THE ELDERLY

The older population is made up principally of women, most of whom live alone. They remain in the community setting for as

long as possible. Most are unemployed, and many live under reduced economic circumstances. Some suffer from two or more debilitating chronic illnesses. Despite societal changes, the lives of such older persons continue unchanged, and, as they continue to age, their only expectation is eventual institutionalization or death.

The general apathy toward the aging process and older persons leads to premature aging, wherein persons become more prone to exhibit behavior patterns and disease symptoms that are generally characteristic of much older persons. Persons of 70 appear 90; those 90 appear 110 or older. There is a concomitant lack of fit between the person and the environment. The environment, unadapted to the physiological and psychological needs and concerns of older persons, is antiquated, and thus provides little accommodation of older adults. Such lack of environmental accommodation causes older persons to assume stereotypical postures and behaviors. Older persons are not encouraged to develop skills to deal with the environment, and the rigidity of the environment promotes the onset and growth of disease (Klerk, Huijsman, & McDonnell, 1997).

Freedom and independence have been promised through the adaptation of technologies to offset the debilities of age and are yet to be forthcoming. The home environment of many persons has changed little from the post-World War II era. The SMARTHOUSE that has long been promised that would incorporate various facets of modern technology permitting older persons to remain in their own homes and within the community setting indefinitely has not even enabled older persons to change a light bulb safely (Lesnoff-Caravaglia, 1999). The SMART nursing home has not gone beyond the incorporation of bathroom grab bars. SMART hospitals are nonexistent in terms of daily patient care (McConnel & Murphy, 1990), and the care marshaled out to patients is best characterized as "reluctant care."

UNDERSTANDING AGING

Although it is recognized that biological changes are inevitable as part of the aging process, it is not clear why such changes occur. The process of aging, in and of itself, is poorly understood. An ancient belief held that there was a magic elixir or potion that could halt aging or retard its progress. The explorer Ponce de León was sent to the New World by Queen Isabella of Spain to find the "fountain of youth." His mission was inspired by the fact that the Queen's husband, King Ferdinand, reported to be several years her junior, would lose interest in her as she grew older. Ponce de León did not find the fountain of youth, but he discovered Florida. The Florida that, curiously enough, became the haven of the elderly of today.

It is not unusual to see an old human being, but aged animals exist only in captivity. Wild animals do not usually reach extreme old age or even what in humans is referred to as middle age. Wild animals thus resemble ancient or prehistoric human beings who rarely, if ever, saw an old person. Of the 300 Neanderthals found, only one may have been a postmenopausal woman (Hayflick, 1994).

There is extensive documentation that not only physical vigor, but also less obvious powers, such as the ability to resist disease and the physiological capacity of many major organs, peak and then decrease in human beings and other animals following sexual maturation. Some of the more obvious normal age changes include loss of strength and stamina, farsightedness, new hair growth in ears and nostrils, decline in short-term memory, balding, loss of bone mass, decrease in height,

hearing loss, and menopause. Although most of these changes can be viewed externally, they have their origins at levels not readily perceived by the senses (Hayflick, 1994).

Normal age changes make humans more vulnerable to diseases that in youth would be more easily repulsed. As the immune system ages, it becomes less efficient in defending the body and more likely to make errors in defense. It may mistake normal proteins in the body for foreign proteins, thus producing antibodies against its own cells and result in an autoimmune disease (Ross, 1995).

The diseases associated with old age are not part of the normal aging process. Cancer, heart disease, Alzheimer's disease, and strokes become more prevalent as persons age because of the reduced capacity to repel them. Often their long maturation permits them to manifest themselves in old age, although they are initiated at much younger ages. Some diseases, such as herpes and tuberculosis, can be dormant for years and become reactivated in old age (Lesnoff-Caravaglia, 1988). This increase in vulnerability results from the normal aging process.

The improper understanding of the aging process leads to the physiological losses experienced in old age and, ultimately, death. Unless more attention is paid to the fundamental processes of aging, the fate of everyone fortunate enough to become old will be death on or around his or her 100th birthday. The true causes of those deaths will probably be unknown because of lack of basic research that would increase the knowledge of the fundamental aging process and insights into how to reduce human vulnerability to the current causes of death (Hayflick, 1994).

Contemporary theories of aging cannot account for the reasons why people age. One theory, the wear-and-tear theory, maintains that the body simply wears out over time. Other theories deal with the changes within the cells themselves, while still others state that aging is programmed and is regulated by an aging clock located in the hypothalamus. The gene theory maintains that there are certain genes that contribute to bodily dysfunctions, and that these genes appear to become activated as persons grow older. In addition, there is the cellular-garbage theory that claims there are certain deposits (such as lipofuscin) that accumulate in cells to create dysfunctions that lead to aging and, ultimately, death.

The autoimmune theory is gradually commanding the greatest attention. According to this theory, the immune system gradually breaks down and, thus, permits certain diseases to be activated in old age or causes diseases of long maturation to manifest themselves in old age. This results because the immune system in older persons appears to function less efficiently.

No theory adequately explains why people age, or how they age. Some hypotheses promulgated to help retard the aging process include: lowering the caloric intake, sleeping in colder environments, or developing special diets. The ideal appears to be to keep people young for as long as possible, and to avoid old age altogether.

Aging occurs within the body at the cellular level, as well as outwardly. Yet, it is the outward signs that are referred to when commonly describing aging, such as the graying of the hair, wrinkled skin, loss of hair, stooped posture, or other alterations in appearance. In some older persons, the posture is so bent that the person appears to be facing the ground. Such postural changes probably provided the basis for the old proverb that the grave beckons the old.

CHRONOLOGICAL AGE

Chronological age refers to the number of years a person has lived or an individual's