

**ECONOMIC SECURITY IN AN AGING POPULATION:
IMPLICATIONS FOR THE DESIGN AND MARKETING
OF GROUP PRODUCTS**

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ABSTRACT

The paper provides an overview of the impacts of population aging on the design and marketing of group life and health and group pension products over the next 40 years. The paper first reviews what is meant by population aging and then examines its impact on each of these group coverages in turn.

INTRODUCTION

Although insurance and employee benefit products are unique in many ways, their design and marketing still must respond to the realities of the marketplace as would any product. One of the most important aspects of product design and marketing is an understanding of the demographics of the marketplace.

This paper provides an overview of the most important aspects of the shifting demographics of the insurance and employee benefits marketplace. The paper first reviews what is meant by "population aging" and also by the phrases "baby boom" and "baby bust." It then examines the impact of shifting demographics on each of the group product lines.

While the paper is written with a group focus, the implications of the material for individual product design and marketing are immediately obvious and equally important.

POPULATION AGING DEFINED

Despite all that has been written about population aging and the related baby boom, misconceptions and a great deal of misinformation still remain. Clearly people in North America are living longer than ever before. Tables 1 and 2 indicate the significant improvement in life expectancies in Canada and the U.S., respectively, this century, especially among females.

TABLE 1
LIFE EXPECTANCY IN CANADA [16]

Year	At Birth		At Age 65		At Age 75	
	Male	Female	Male	Female	Male	Female
1921	58.8	60.6	13.0	13.6	7.6	8.0
1941	63.0	66.3	12.8	14.1	7.5	8.2
1961	68.4	74.2	13.5	16.1	8.2	9.5
1981	71.9	79.0	14.6	18.9	9.0	11.9
1986	73.0	79.7	14.9	19.1	9.1	11.9

TABLE 2
LIFE EXPECTANCY IN THE U.S. [13]

Year	At Birth		At Age 65	
	Male	Female	Male	Female
1930	59.8	61.1	11.7	12.8
1950	65.5	71.0	12.7	15.0
1988	71.4	78.5	14.8	18.6

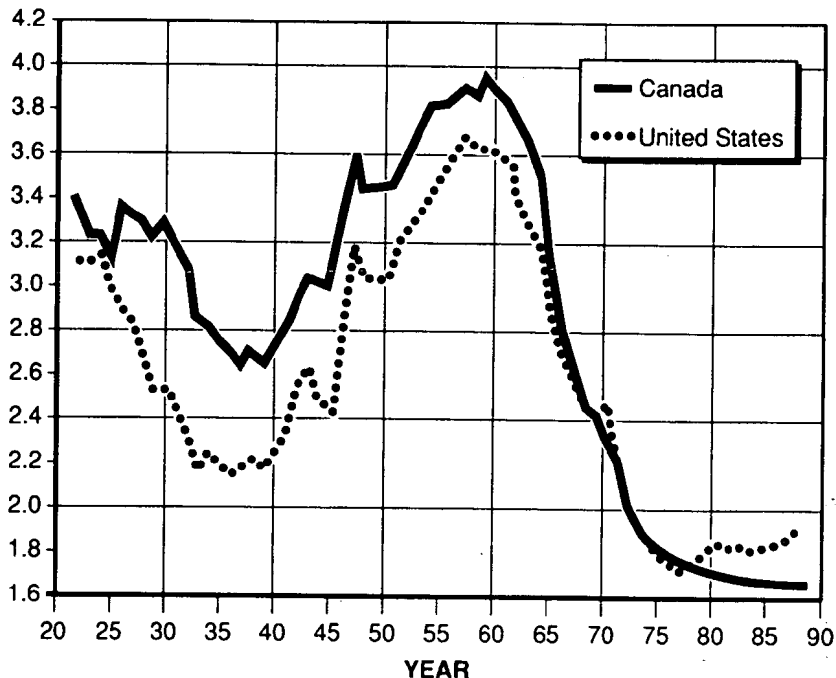
Obviously, if every individual in the population is expected to live longer, then the population as a whole will age. However, if this were the only cause of population aging, there would be little reason for this paper.

An alternative definition of the age of a population is used by the United Nations in deciding which of the world's populations are young or old. The U.N. criterion is to look at the percentage of the population that is age 65 or older. A young population has a small proportion of its population over age 65, while an older population has a relatively large percentage of its population age 65 or over. Because of enhanced life expectancy, the proportion of the population age 65 or over (all else being equal) would increase. However, this definition can also be affected by other changes in the age distribution of the population.

In particular, for Canada and the U.S., a more compelling reason for the anticipated rise in the proportion of the population that is age 65 or over is the baby boom.

Figure 1 shows the fertility rates in Canada and the U.S. since 1922. Both countries experienced the same sharp rise in fertility rates after

FIGURE 1
TOTAL FERTILITY RATES 1922 TO 1988*



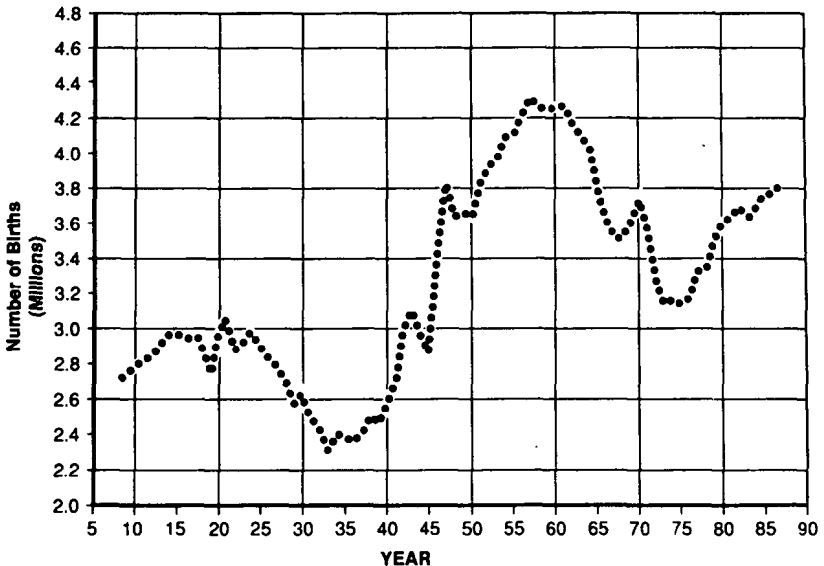
*From Brown, R.L. *Introduction to the Mathematics of Demography*. 2nd ed. Winsted, Conn.: Actex Publications, 1993. Copyright © 1993, Actex Publications. Reprinted with permission.

World War II and the same sudden drop in these fertility rates in the late 1960s. This has become known as the baby boom tidal wave, with the baby boom followed by the baby bust. Only four countries in the world experienced a baby boom tidal wave worthy of note, namely, Canada, the U.S., Australia, and New Zealand. Note that the peak of the boom was higher in Canada than in the U.S., while the Canadian trough was lower than the U.S. trough. Hence, the impact of the tidal wave is more significant in Canada than in the U.S. Note also the beginning of an upturn in the fertility rates in the late 1980s. This upturn has continued, and the fertility rate in the U.S. now is more than 1.90, while in Canada it is now 1.82. This is a measure of the number of children the

average female will have in her lifetime. For zero population growth (ignoring migration), a fertility rate of close to 2.10 is required.

Figures 2 and 3 show the number of live births in the U.S. and Canada, respectively, this century. Again, we can see clearly the baby boom and baby bust that create the tidal wave of shifting demographics.

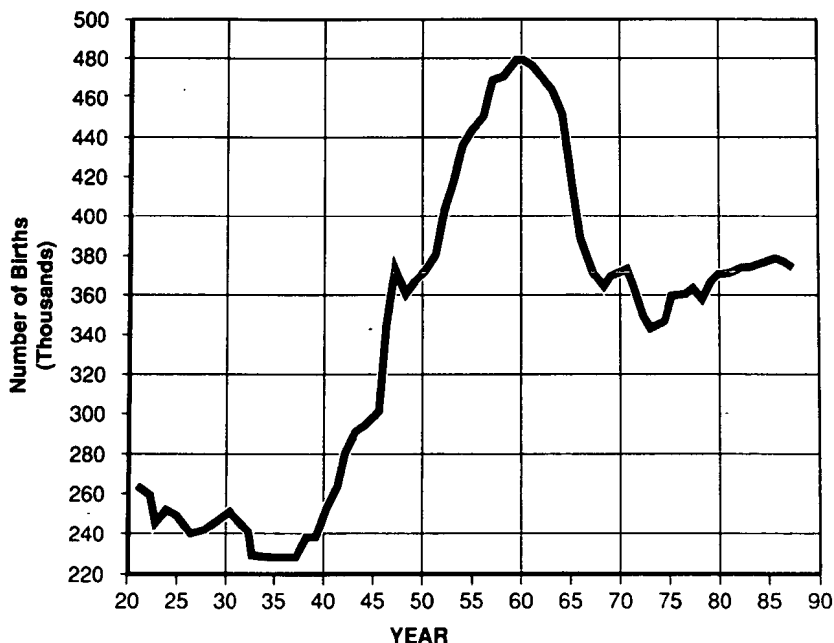
FIGURE 2
UNITED STATES LIVE BIRTHS*



*From Brown, R.L. *Introduction to the Mathematics of Demography*. 2nd ed. Winsted, Conn.: Actex Publications, 1993. Copyright © 1993, Actex Publications. Reprinted with permission.

Two theories attempt to explain the rise and fall in fertility rates. Easterlin [6] has postulated that fertility rates rise and fall in a wavelike pattern with a cycle length, from peak to peak or from trough to trough, of two generations. He points out that couples from a small cohort, such as those born in the 1930s, find life relatively easy. Jobs are plentiful; advancement is fast; and wealth is accumulated more easily than anticipated. Such couples will tend to have large families, as they did.

FIGURE 3
CANADIAN LIVE BIRTHS*



*From Brown, R.L. *Introduction to the Mathematics of Demography*. 2nd ed. Winsted, Conn.: Actex Publications, 1993. Copyright © 1993, Actex Publications. Reprinted with permission.

On the other hand, couples from a large cohort, such as those born in the 1950s and 1960s, find life more difficult. Unemployment is high; advancement is slow; and wealth is more difficult to accumulate. These couples tend to have small families. If Easterlin is correct, then the noted recent upturn in fertility rates should be expected to continue.

A British demographer, Ermisch [8], starts from the same basis as does Easterlin (since he has to explain the baby boom of the 1950/60s), but comes to a different conclusion. He says that in a one-earner family, if the worker's real wages rise rapidly and the cost of children remains constant, that family will have more children. This is what happened in the 1950s and 1960s. In a two-earner family, however, if real wages rise rapidly but the wife has to leave the work force or interrupt a career path to bear and raise children, then the cost of children rises and fertility

rates will not change. Ermisch's data show that the higher a woman's earning power, the longer the gap between marriage and first birth. He also points out that the increased probability of divorce may keep the fertility rate down. In conclusion, Ermisch sees no reason to believe that fertility rates will rise very much, if at all. He anticipates that they will remain level below a replacement rate.

The North American tidal wave has become known as the post-war baby boom. There are at least two problems with calling this demographic phenomenon the post-war baby boom, however. First, by so describing it, the cause of the baby boom is normally assumed to be the return of the soldiers from the war. Such is not the case. Rather, the cause of the baby boom was the strong economy of the 1950s in comparison to the economic expectation of those born and raised during the Depression. It was this combination that led to the large families with stay-at-home mothers of the 1950s and early 1960s (the "Leave It to Beaver" generation).

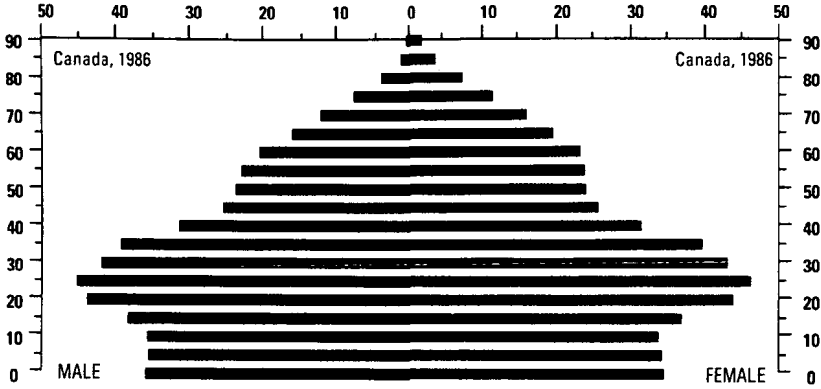
Second, baby boomers are assumed to be those who were born in 1945 or shortly thereafter. That is, in 1992, baby boomers would be assumed to be age 48. That also is not true. In fact, a careful study of these graphs leads to the conclusion that in both Canada and the U.S., the baby boom can be measured as the births in the years 1951 to 1966, while the baby bust started after 1966. The number of live births peaked in 1957 in the U.S. and in 1959 in Canada. The year 1958 could be used as the actuarial compromise single statistic.

Today, in 1993, the baby boomers are age 27 to 42. A single statistic to describe the age of the average boomer would be age 35, not age 48. That misconception about the baby boom could lead to as much as a 13-year miscalculation in targeting marketing!!!

What followed the baby boom was the equally dramatic baby bust, and it is this total demographic shift that is creating the environment referred to as population aging.

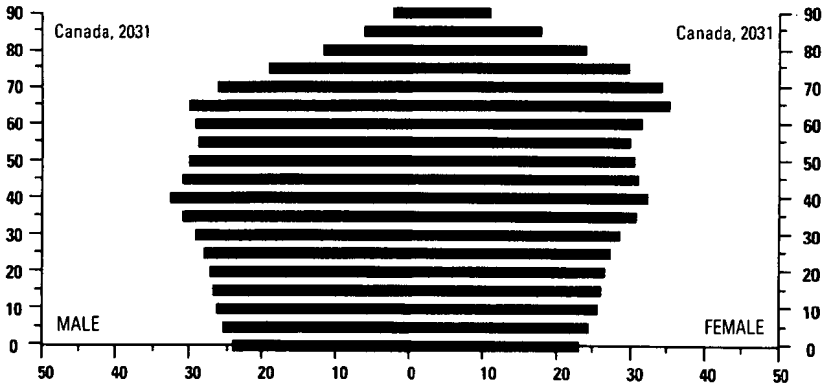
Figures 4 and 5 show how this shift in demographics will affect the Canadian population pyramids in 1986 and in 2031, respectively (the U.S. looks very much the same). These pyramids show the percentage of the population within each age group, females on the right and males on the left. In a stable population (one in which birth and death rates are constant year after year), these histograms would look like a pyramid: broad in the base and then, because of mortality, working gradually to a peak at the top. Figures 4 and 5 do not look like pyramids, however.

FIGURE 4
CHANGES IN THE AGE STRUCTURE IN CANADA IN 1986 [10]



Instead, the baby boom moves through each age group, followed by the baby bust, like a python swallowing a pig. There is also evidence of the echo of the baby boom (which is being born now). In the year 2031 (Figure 5), instead of looking like a population pyramid, the histogram looks more like a pregnant cylinder. It is in this period, from 2015 to 2045, that the impact of the baby boom tidal wave will have the greatest

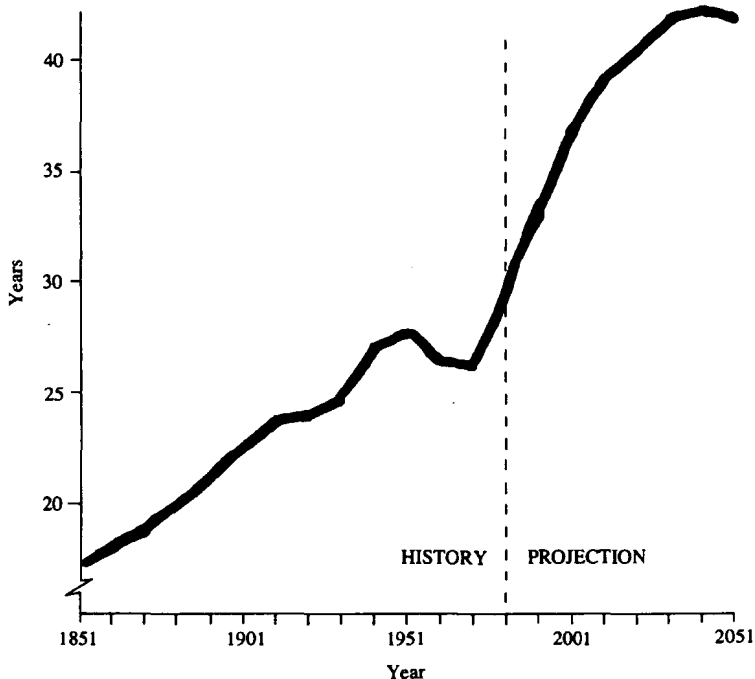
FIGURE 5
CHANGES IN THE AGE STRUCTURE IN CANADA IN 2031 [10]



effect on the insurance marketplace, especially on plans sponsored by our federal governments. This knowledge can be used to aid you in your marketing today.

In conclusion, the population aging that will take place over the next half-century, as displayed in Figure 6 for Canada, is due more to the baby boom/bust tidal wave than to enhanced life expectancy.

FIGURE 6
HISTORICAL AND FUTURE MEDIAN AGE, CANADA, 1851-2051*



*From Foot, D.K. *Canada's Population Outlook*. Ottawa, Ont.: Canadian Institute for Economic Policy, 1982. Copyright © 1982. Reprinted with permission.

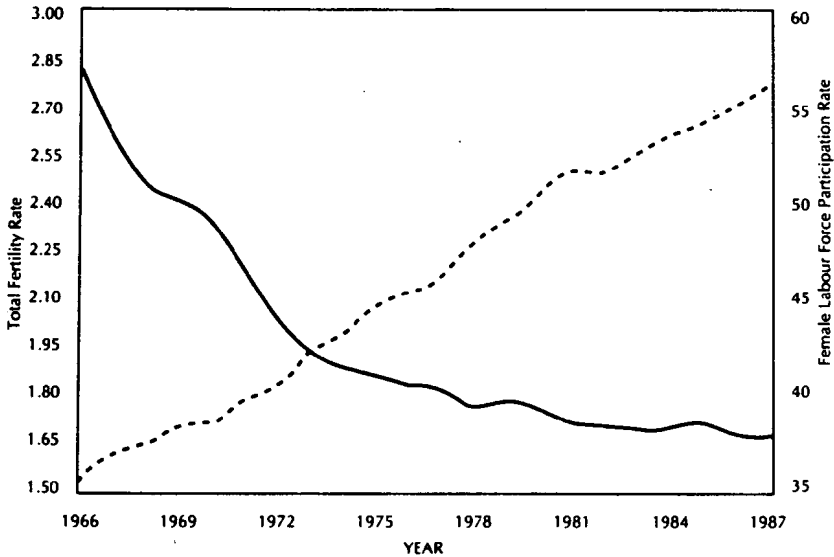
OTHER DEMOGRAPHIC SHIFTS

The other important demographic phenomenon of the last 25 years has been the shift in female labor force participation rates, as indicated in

Figure 7 (again, statistics for the U.S. would look very much the same). More than half of the female population in the working ages is actively in the labor force. It is interesting to juxtapose the rise in female labor force participation rates with the falling fertility rates in the same time frame. However, it is not clear exactly which was the cause or which was the effect. That is, did rising labor force participation lead to falling fertility rates, or did falling fertility rates lead to rising labor force participation rates? Perhaps that is an argument for the sociologists. Certainly the most common viewpoint in the literature is that both these demographic shifts had more to do with basic economics (the continued rise in consumer expectations coupled with the significant opportunity costs of staying home to raise children) than with sociology. Remember that the baby boom exists because the economics of the 1950s exceeded the expectations of the cohort born or raised in the Depression. However, having experienced the enhanced consumerism of the 1950s, those children, as potential parents of the 1970s and 1980s, had expectations that were not met by the economic realities.

FIGURE 7

FERTILITY RATES VERSUS FEMALE LABOR FORCE PARTICIPATION RATES [14], [15]



Whatever the reasons, the people responsible for the marketing of group life and health and group pension products must be cognizant of this change in the workforce. In many instances, the person to whom sales should be targeted is female. In some cases, the plan sponsor also is female. That means tailoring each product line to the needs of a workforce that is far more female and, whether female or not, has many more single heads of household. Further, for households with two wage earners, duplication of benefits is a negative factor in plan acceptance. Thus a continued rise in consumer demand for cafeteria group insurance plans and for more flexible pension arrangements (for example, a plan that allows the withdrawal of some vested benefits if one spouse wants to stay home for a year or two to raise children and then wishes to return to plan participation) should be expected. I believe that companies that have female employees participating in the design and marketing of group products will be more successful in targeting that female market.

IMPLICATIONS OF POPULATION AGING

Population aging is taking place at different rates in different countries of the world. Table 3 shows the projected percentage increase in the population age 65 and over between 1985 and 2025 for several countries around the world. This increase can be caused not only by an increase in the number of people alive age 65 and over, but also by a decrease in the number of people alive age under 65. In the countries with the greatest percentage shift, both are happening (as is the case for Canada and the U.S.).

Remember that only Canada, the U.S., Australia, and New Zealand experienced the baby boom tidal wave. Countries like India and China are experiencing high rates of population aging purely because of fertility controls brought in either by the government or (in the case of Japan) voluntarily by the population for economic reasons, since the 1950s.

The rate of change in the proportion of the population that is age 65 and over will have a dramatic impact on the ability of the government to fund the social security programs now in place for the elderly. This includes OASDI and Medicare in the U.S. and OAS, GIS, C/QPP, and Universal Health Care in Canada.

TABLE 3
 PROJECTED PERCENTAGE INCREASE IN
 THOSE AGE 65+ FROM 1985 TO 2025 [17]

Country	% Increase
India	264
China	238
Hong Kong	219
Canada	135
Australia	125
Japan	121
Israel	116
United States	105
France	67
Italy	51
West Germany	36
United Kingdom	23
Sweden	21

Countries like India, China, and Hong Kong have little to worry about in this regard because they have not set up social security schemes with any significant benefits. Thus, for them, the aging of the population will result, not in the need to cut back existing programs, but rather in the inability to create them. At the other extreme, if countries like Sweden and the United Kingdom are able to afford the social security systems now in place, they will face little pressure, because of population aging, on the cost of these plans over the next half-century and, politically, should not feel compelled to impose massive cutbacks on existing programs.

It is precisely countries like the U.S. and Canada that will face growing pressure to cut back social security programs already in existence for those age 65 and over. In fact, early indications of these pressures already exist.

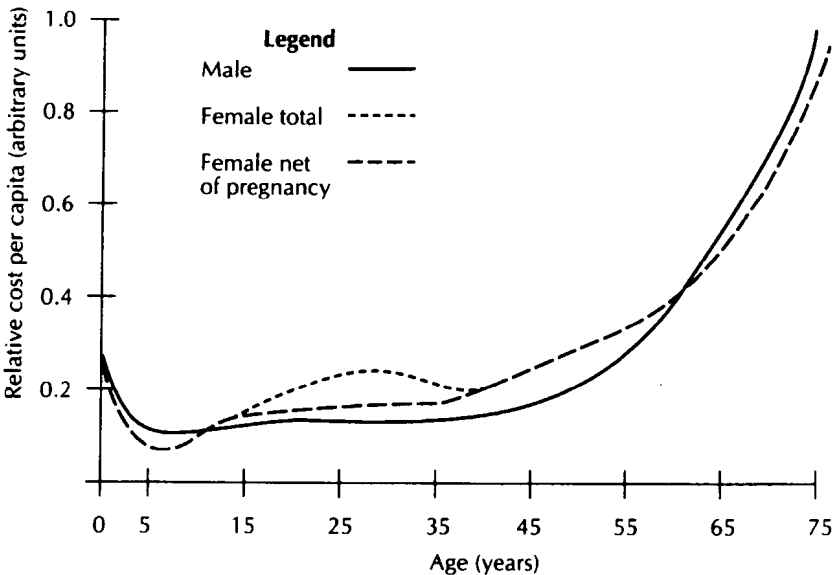
Such pressures are exacerbated by the current level of debt of the federal governments. In Canada, the annual deficit is close to \$35 billion and the accumulated federal debt is now approximately \$450 billion. In the U.S., the annual federal deficit is \$300 billion and the total debt is close to \$4 trillion. Given this political reality, the discussion that follows assumes no major expansion in government-sponsored social security.

On the health-care front, both Canada and the U.S. face continued pressure to deliver first-class health care to everyone at an affordable

cost. Articles now appear on a regular basis discussing the efficacy of spending large health-care dollars on the elderly, that is, on people who have little chance to pay back this investment or even return to a fully active lifestyle. Figure 8 shows that there is a relationship between the dollars spent on health care and the age of the participant. The elderly use the health-care system a great deal more than the young or middle-aged. Thus, if the entire population is aging, continued rises in health-care costs can be expected even with no increase in the cost of any existing procedure and even with no new procedures or technologies. Table 4 presents similar statistics but with a different breakdown. This rather complex table shows that most of the usage of our health-care facilities takes place in the final year of life, regardless of the age of the patient.

Research has shown that 30 percent of all health-care expenses occur in the final 30 days of life; 46 percent in the last 60 days; and 77 percent

FIGURE 8
RELATIVE PER CAPITA COSTS OF HEALTH CARE FOR MALES AND FEMALES BY AGE*



*From Marshall, Victor W. *Canada, Social Perspectives*. 2nd ed. Markham, Ont. By permission of Fitzhenry and Whiteside, publishers. Copyright © 1987. Reprinted with permission.

TABLE 4
HOSPITAL USAGE (AVERAGE DAYS PER YEAR) [7]

Age	Individuals with No Deaths	Individuals Who Died			
		Number of Years before Death			
		4	3	2	1
25-64	1.3	6.0	7.6	7.6	23.5
65-84	3.8	7.1	9.4	10.6	32.0
85+	6.8	9.5	9.9	8.1	24.4

during the last six months regardless of age. Therefore, we are not over-spending our health-care budget on the elderly per se; rather we are spending huge amounts of money trying to delay the inevitable, death.

GROUP HEALTH BENEFITS

The health-care delivery system in the U.S. is usually referred to as a privately funded system. While the U.S. may have a larger base of private funding than most other systems in the world, it is far from totally private. In fact, the government pays 42 percent of all health-care costs in the U.S., made up of 16 percent from Medicare, 11 percent from Medicaid, and 15 percent from other government programs. Private health insurance pays 32 percent of health-care costs; 5 percent comes from other private sources (for example, employer self-funded plans); and the other 21 percent represents out-of-pocket expenses. Total health-care costs represent 12.2 percent of the U.S. GNP (1990).

Canada has a national government-administered health-care delivery system.

Prior to 1958, the health-care delivery systems in Canada and the U.S. were very similar; only two provinces in Canada had limited government-sponsored health-care delivery systems: Saskatchewan (1946) and British Columbia (1949). In 1958, the Canadian federal government introduced the Hospital Insurance and Diagnostic Services Act whereby the federal government would pay approximately 50 percent of the cost of Provincial Health Care Plans that qualified under defined criteria. By 1961, all provinces and territories had joined the national program, which focused on prepayment of hospital inpatient care and diagnostic services. This was followed by the Medical Care Act (1968), which added universal coverage of physician services. All provinces and territories joined the medical care arrangements by 1972.

In 1977, the federal government replaced its system of federal matching funds with block grants to each province. This not only lessened the burden of funding health care for the federal government, but also encouraged the provinces to contain health-care costs. Since 1977, the level of federal support for health care has decreased from 50 percent of the cost to approximately 33 percent of the cost.

Canada's public plans cover more than 90 percent of the population's costs for hospital care and almost all costs for physician services. This costs Canadians 8.8 percent of their GNP in total (1990). Services not covered by the government plans include: eyeglasses, dental care, outpatient prescription drugs, and private or semiprivate hospital care unless medically necessary. These costs often are covered by private plans, especially employer-sponsored plans.

Because of the political realities previously discussed, the pressure to prefund health-care costs prior to retirement will continue, especially in the U.S. The government will continue to expand the list of group health benefits that are mandated and that continue coverage postretirement, where the employer/plan sponsor (and its insurer) is ultimately responsible for the cost.

With the rise in the age of eligibility for OASDI retirement benefits, there could be a similar rise in the age of entitlement for Medicare. The government could increase cost-sharing through increased deductible and/or coinsurance levels. Health-care benefits may become taxable, at least partially, in the hands of the beneficiary. The government could even introduce a means test to limit Medicare to those who can show need. All others would be expected to receive postretirement coverage from employer plans or to buy private coverage.

In Canada, there will be a continued withdrawal of benefits and services from the government-sponsored health-care system. Coinsurance or deductibles may be introduced.

In response, employees will demand that these benefits and services be added to their group medical coverage. Providing such benefits at an affordable cost then becomes the responsibility of the insurer. An analysis of the impact of such demands is presented in the next section.

Similar pressures will exist for the prefunding of the costs of long-term care. Neither the Canadian nor the U.S. health-care system currently pays for long-term custodial care. In Canada, OAS/GIS benefits, payable to all poor elderly Canadians, guarantee access to an acceptable level of long-term custodial care. However, in the U.S., one is often

forced to exhaust one's personal assets before long-term custodial care is provided.

The demand for a more flexible use of existing insurance products to fund long-term-care costs can be expected to continue. For example, there is a growing interest in the concept of paying accelerated death benefits for long-term care. Regardless of the source, these costs will continue to grow; they must be paid; and the government, because of population aging, will not have the resources to be the sole funding agent.

GROUP LIFE BENEFITS

Population aging will bring direct pressure to the group life line of business. Based on the assumption that the average large employer has a random selection of the general population as employees, then the same population aging that is taking place in the general population will also be seen in the labor force. As members within any group life coverage age, on average, rising benefit costs will be associated with that aging.

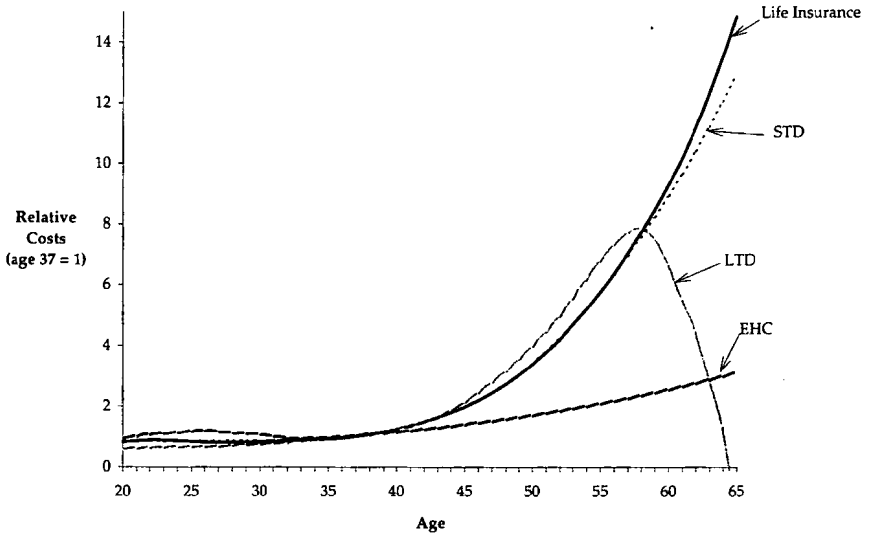
The impacts of the aging of the workforce were analyzed by Peter Muirhead, an actuary, and presented at the spring 1993 meeting of the Canadian Institute of Actuaries [2].

Muirhead projected group life and health benefits by assuming that the demographics of the workforce by age mirror those of the aging population from which they are drawn. Expected mortality comes from the 1985-87 Canada Life Tables. Extended-health-care (EHC) costs are based on age/sex specific Canadian cost factors. Long-term-disability (LTD) costs use the 1987 Group LTD Table and an interest rate of 8 percent. Short-term disability (STD) is based on the 1985 CIDA Table. It is assumed that group dental costs are not affected by population aging.

The relative size of these costs (age 37=1) is shown in Figure 9. Applying these age-specific relative cost factors to the aging labor force population results in group benefit costs that rise 20 percent faster than payroll over the period 1991-2021 because of population aging alone. In Canada, that would mean a rise in group benefit costs from 5 percent of payroll to 6 percent of payroll, as shown in Figure 10.

However, Muirhead goes on to point out that, for many of the reasons outlined in the previous section, health-care costs funded by employers will rise faster than other group benefit costs. In fact, as shown in Figure 11, in the period from December 1987 to December 1992, while general inflation rose 22 percent, privately insured EHC costs in British

FIGURE 9
INSURANCE COSTS*



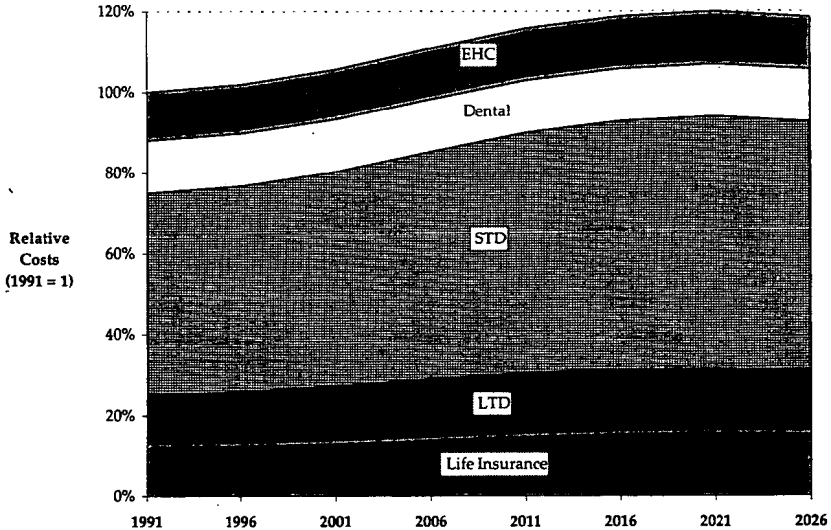
*From Blue, Donald A., Brown, Robert L., and Muirhead, Peter M. "The Aging Population." In *Proceedings of the Canadian Institute of Actuaries, March 1993, Banff, XXIV*, no. 2 (1992-1993): 248-271. Copyright © 1993, Canadian Institute of Actuaries. Reprinted with permission.

Columbia rose 95 percent, or about 10 percent per annum above general inflation.

With the government's continued attempts to pass health-care costs back to the group sponsor in mind and with the knowledge that EHC costs had been rising faster than inflation from 1987 to 1992, Muirhead did two more projections. The first, displayed in Figure 12, assumes that EHC costs increase annually at a rate 5 percent faster than payroll costs. Under these assumptions, group benefit costs of 5 percent of payroll in 1991 will increase by more than 60 percent to 8.3 percent of payroll in 2021 and will increase by 80 percent to 9 percent of payroll in 2031.

If employer-sponsored EHC costs are assumed to rise annually by 10 percent more than payroll costs, the group benefit costs would increase by more than 350 percent and equal 23 percent of payroll in 2026 (see Figure 13). Clearly the implications are critical.

FIGURE 10
 PROJECTED GROUP BENEFIT COSTS
 (NO INFLATION IN COST OF EXTENDED HEALTH CARE AS PERCENTAGE OF PAYROLL)*

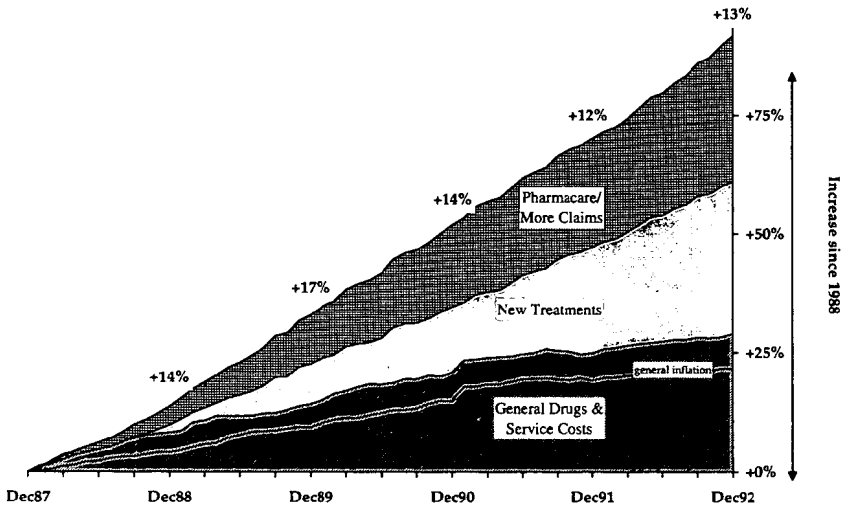


*From Blue, Donald A., Brown, Robert L., and Muirhead, Peter M. "The Aging Population." In *Proceedings of the Canadian Institute of Actuaries*, March 1993, Banff, XXIV, no. 2 (1992–1993): 248–271. Copyright © 1993, Canadian Institute of Actuaries. Reprinted with permission.

Another cost pressure exists because the labor force growth rates of the last 20 years have now ended. Hence, the ability to increase any company's coverage volume will require an increase in its market share.

On top of all these expectations of cost pressures, there are the *FAS 106* reporting requirements. Under *FAS 106*, employer/plan sponsors have to account for the cost of postretirement benefits as a liability in their annual statement. It has been estimated that in the U.S. this will create an initial increase in liabilities of close to \$1 trillion and hence an equivalent \$1 trillion draw on unassigned surplus or shareholders' equity. Because of universal government-sponsored health care in Canada, this problem has a much smaller magnitude, but the requirements are still intended to be implemented for Canadian corporations. The American

FIGURE 11
COST OF CLAIMS (EXTENDED HEALTH CARE)*



*From Blue, Donald A., Brown, Robert L., and Muirhead, Peter M. "The Aging Population." In *Proceedings of the Canadian Institute of Actuaries, March 1993, Banff, XXIV*, no. 2 (1992–1993): 248–271. Copyright © 1993, Canadian Institute of Actuaries. Reprinted with permission.

Actuarial Standards Board has published a compliance guideline for *FAS 106*,¹ and the Canadian Institute of Actuaries has drafted a standard of practice² for accounting for postretirement fringe benefits.

Obviously, employer/plan sponsors are looking for ways to minimize the impact of *FAS 106*, especially when it coincides with a period in which the costs of group life benefits are expected to rise significantly. There will be pressure on group benefit consultants to find ways to redesign plans. The goals will be to find ways to prefund such benefits, with the employees paying more of the cost of such benefits. There may also

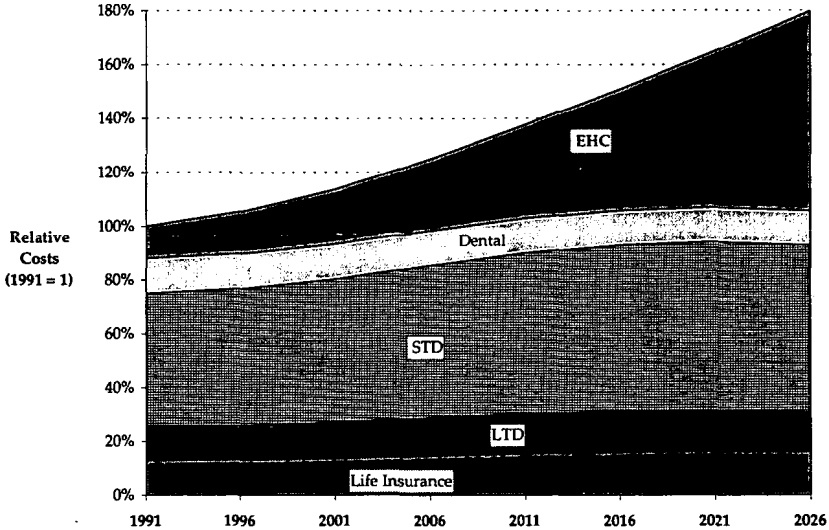
¹Actuarial Compliance Guideline No. 3: For Statement of Financial Accounting Standards No. 106. Employers' Accounting for Postretirement Benefits Other Than Pensions."

²Recommendations for Actuarial Advice Given with Respect to Liabilities Pertaining to Postretirement Benefits (Other Than Pensions)."

FIGURE 12

PROJECTED GROUP BENEFIT COSTS

(5% ANNUAL INFLATION IN COST OF EXTENDED HEALTH CARE AS PERCENTAGE OF PAYROLL)*



*From Blue, Donald A., Brown, Robert L., and Muirhead, Peter M. "The Aging Population." In *Proceedings of the Canadian Institute of Actuaries*, March 1993, Banff, XXIV, no. 2 (1992-1993): 248-271. Copyright © 1993, Canadian Institute of Actuaries. Reprinted with permission.

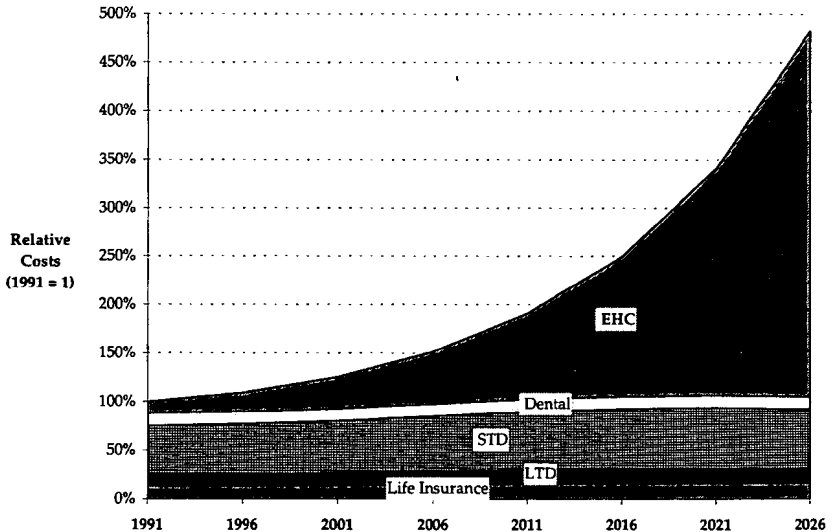
be pressure to decrease postretirement benefits that are not state-mandated. Certainly, all these forces will create most interesting times for group benefit actuaries and marketing professionals.

GROUP PENSION BENEFITS

The U.S. and Canada have developed economic security systems that present three sources of retirement income security for the elderly. The first tier is government-sponsored social security. In the U.S. this is the OASI (Old-Age and Survivors Insurance) system, whereas in Canada it is the combination of OAS (Old Age Security), GIS (the Guaranteed Income Supplement), and C/QPP (the Canada/Quebec Pension Plan).

Interestingly enough, given the wide differences between the two approaches to retirement income security, for a worker who consistently

FIGURE 13
 PROJECTED GROUP BENEFIT COSTS
 (10% ANNUAL INFLATION IN COST OF EXTENDED HEALTH CARE AS PERCENTAGE OF PAYROLL)*



*From Blue, Donald A., Brown, Robert L., and Muirhead, Peter M. "The Aging Population." In *Proceedings of the Canadian Institute of Actuaries, March 1993, Banff, XXIV*, no. 2 (1992-1993): 248-271. Copyright © 1993, Canadian Institute of Actuaries. Reprinted with permission.

earns the average industrial wage (AIW), both countries would provide that worker with a retirement income equal to 40 percent of his or her final salary. In the U.S. this comes from the OASI normal retirement benefits, whereas in Canada it is a combination of 25 percent from the C/QPP, close to 14 percent from OAS, and, depending on other circumstances, perhaps a very small additional benefit from GIS. In both countries, workers below the AIW retire with a higher replacement ratio provided by the government-sponsored systems, while those with larger lifetime earnings will have to provide more of their retirement income from nongovernment sources.

There are two aspects to the provision of retirement income security. First, a basic level of guaranteed income (with a guaranteed purchasing ability) is needed to guarantee basic survival. This is provided by the

government in Canada. For someone who was regularly employed in the U.S., this is provided by OASI, but for those who were regularly unemployed, worked part-time, or earned very low wages, even this level of economic security is not guaranteed in the U.S., outside of public assistance.

The second aspect of retirement income security is the retention of some level of a standard of living. That is, one does not want to go from living on \$100,000 a year to living on \$20,000 a year. While OASI and the C/QPP are earnings-related, government plans do not guarantee this second level of income security. Instead, workers turn to employer-sponsored pension plans and individual retirement savings plans to fund this level of security.

Population aging is going to put a lot of pressure on the ability of existing government-sponsored retirement income security schemes. The controversies that surround these schemes will greatly assist those marketing group pension products.

The 1983 amendments to the OASI system were the first public indication that there might be some issue of the continued affordability of the OASI benefits. In 1983, two significant amendments were made to the scheme. First, OASI retirement benefits became partially taxable income in the hands of the recipient. Until that time, such benefits were tax-free. Second, through enactment, it was announced that the normal retirement age for OASI retirement benefits (the youngest age at which unreduced benefits are paid) would be raised. According to the 1983 amendments, the normal retirement age, which had always been age 65, would rise in two steps, first from age 65 in 2005 to age 66 by 2009 and then, starting in 2021, a further shift in the normal retirement age up to age 67 by 2027.

These two legislated changes will have an impact on group pension plans. At the time of writing, OASI retirement benefits were taxed only on one-half of these benefits and only for higher-income persons. However, proposed legislation will increase the taxable portion of the OASI benefit to 85 percent. Further, the income criteria that define those who are "higher-income" is not indexed. Hence, the combination of these impacts will create more demand for greater group pension benefits from employer-sponsored plans. Further, integrated group pension plans will have to fund the full cost of retirement income from the date of retirement to the new higher age of OASI retirement income eligibility.

In Canada, the contributions to the C/QPP continue to rise rapidly both because of population aging and because of previous benefit enhancements. Hence, group pension plans that are integrated with the C/QPP and have employee contributions (which is the norm) should be using a step-rate approach to integrating employee contributions (rather than the offset approach) or abandon integration of contributions altogether. Further, Canadian plan sponsors should anticipate a rise in the C/QPP age of entitlement similar to that previously discussed with respect to OASI.

Canada has also experienced some legislated changes that reduce the retirement income security guaranteed by the government-sponsored plans. All benefits received from OAS and C/QPP have always been taxable income. GIS payments are not taxable income, but that is not a large concession, since, to qualify for GIS, the recipient has to be in a very low tax bracket anyway. Starting in 1991, however, recipients of the Old Age Security benefit who have income in their own right exceeding \$51,765 (in 1991) face an extra 15 percent surcharge, so that for those whose earnings exceed about \$76,000, the entire OAS benefit is "clawed-back." These earnings limits are not fully indexed to the cost of living, so that with each passing year, more and more Canadians will have their OAS benefits taxed back in full. This means that the OAS system will become nothing more than a second-tier GIS.

Such legislative amendments also have an important psychological effect on the person planning for retirement that is highly beneficial to those who are marketing group pension products. These legislative changes remind people that there is no contractual guarantee that social security benefits will be paid. Instead, there exists a statutory agreement between generations of taxpayers that implies that if today's workers support today's retirees, then the next generation of workers will do the same. However, this promise can be amended or abandoned at any time so long as the legislation is supported by the voters.

One advantage that the baby boomers have in this regard is their sheer numbers. It will be difficult to find support for legislation that is harmful to the baby boomers; that is to their advantage. To their disadvantage, however, is the cost to the system that they will create in the years just after 2016 (that is, 1951 + 65).

In Canada, present projections of the contribution rate that will be required to fund the C/QPP indicate that today's (1994) 5.2 percent contribution rate (2.6 percent from the employee and 2.6 percent from the

employer up to the AIW) will more than double to 13.5 percent by the year 2031. For Canadians born in 1920, the expected value of their benefits from the C/QPP is 7 times the expected value of their contributions. For those born in 1960, the expected value of their benefits is 2.6 times the expected value of their contributions. But for those being born today, the expected value of their benefits may be less than the expected value of their contributions, depending on the economic assumptions. These messages are being communicated regularly in the popular press. The average young Canadian workers today do not believe that they will receive the C/QPP benefits that today's retirees are receiving (that is, the benefits that they are being promised).

In a similar analysis, Robert Myers, actuary and architect of the OASDI system, and Bruce Schobel have developed ratios of the actuarial value of one's expected OASI lifetime benefits versus one's expected lifetime contributions; these are shown in Table 5.

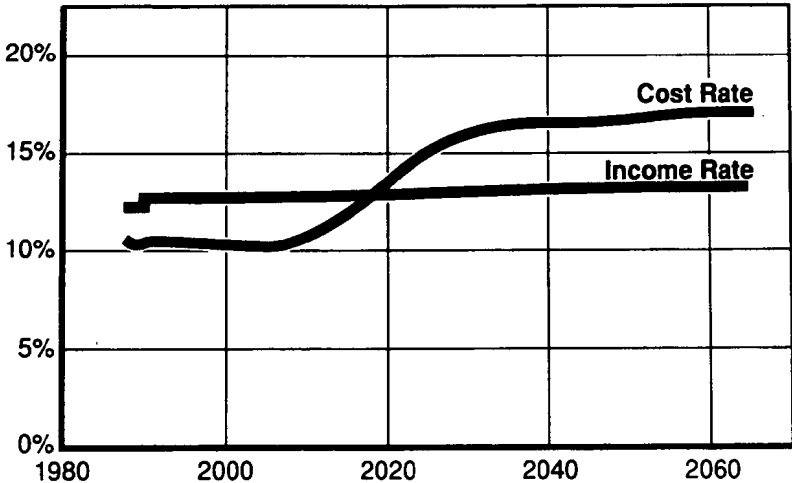
TABLE 5
RATIO OF ACTUARIAL VALUE OF OASI BENEFITS TO CONTRIBUTIONS [12]

Year of Attaining Age 65	Average Wage-Earner			Maximum Wage-Earner		
	Single Man	Single Woman	Married Couple	Single Man	Single Woman	Married Couple
1960	7.10	8.88	13.18	5.66	7.07	10.50
1980	2.75	3.53	5.17	2.49	3.20	4.69
2000	1.24	1.58	2.31	0.97	1.24	1.82
2020	1.11	1.41	2.06	0.76	0.97	1.38

In the U.S., there is now a growing debate about how best to fund the OASI system over the next half-century. Data from the Board of Trustees of the OASI Trust Fund show that, without a legislated change in the contribution rates for OASI now, the OASI Trust Funds will reach a level of 5.47 times the annual outgo in the year 2014 (just before the baby boomers start to retire). The actual size of the trust funds is estimated to peak at \$11.9 trillion in 2030, measured in current dollars (see Figures 14 and 15). Despite this huge buildup, the trust funds are projected to be exhausted in 2046 because of the baby boom followed by the baby bust. At the moment, the OASI surplus is invested in government bonds and is included in the calculation of the federal deficit (that is, any OASI surplus helps to offset the government deficit). Hence, the

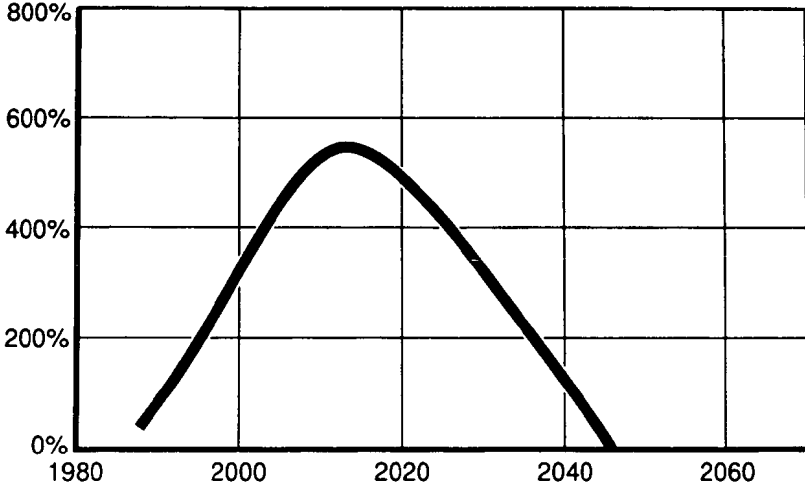
projected buildup of funds to the year 2030 will allow the federal government to fund equally large spending deficits. To prevent that from happening, Senator Daniel Moynihan (backed by Robert Myers) has proposed legislation that would return the Social Security system to a pure pay-as-you-go basis. While this would end the government's ability to fund huge deficits over the next 40 years, such a return to pay-as-you-go funding would also further limit the current statutory security of the baby boomers receiving their full OASI benefits.

FIGURE 14
OASDI INCOME RATE AND COST RATE BASED ON ALTERNATIVE II-B [1]



As these dramas are played out in public, more and more consumers lose faith in their ability to receive the retirement income security benefits now being promised. A recent survey on retirement confidence conducted by the National Taxpayers Union Foundation [11] found that only 33 percent of those not yet retired expect Social Security to be a major income source for them. Eighty-seven percent believe that working people will have to save a higher proportion of income to live comfortably in retirement. Seventy-nine percent believe the proportion of medical costs not covered by Medicare will be higher in the future. Only 11

FIGURE 15
LONG-RANGE CONTINGENCY FUND RATIO BASED ON ALTERNATIVE II-B [1]



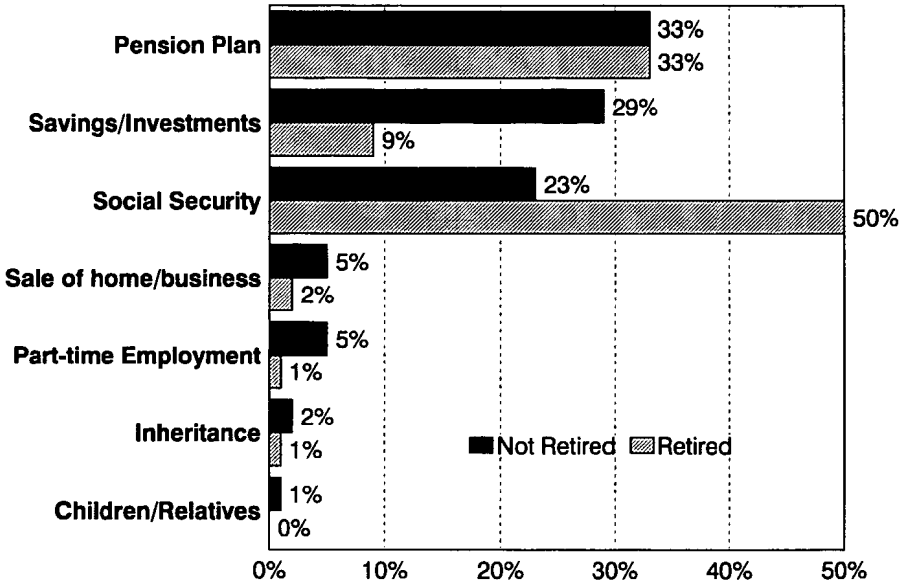
percent of those surveyed strongly agree that they are confident that, in the years to come, Social Security and Medicare will continue to pay benefits of equal value to the benefits received today. In contrast, 34 percent strongly disagree with this statement. A breakdown of two of the questions from the survey is given in Figures 16 and 17.

More and more workers in North America realize that they have to take more personal responsibility for providing for their own retirement-income security, and more and more are turning to nongovernment sources of funding for this security. One of these sources is group pensions, that is, qualified pension plans in the U.S. or registered retirement pension plans in Canada.

The use of qualified or registered plans has very significant tax advantages. Within legislated limits, contributions to such plans are tax-deductible, and, more importantly, the investment income on such plans is not taxed until taken as retirement income.

Tables 6 and 7 show just how powerful these tax advantages are to the plan participant. The tables are designed to portray the ability of a worker who consistently earns the AIW to attain some level of retirement income security. As previously stated, at the moment such a worker, in

FIGURE 16
INCOME SOURCES CONSIDERED MOST IMPORTANT*



*From Mathew Greenwald & Associates, Inc. *National Taxpayers Union Foundation Survey on Retirement Confidence*. Washington, D.C.: 1991. Copyright © 1991, Mathew Greenwald & Associates, Inc. Reprinted with permission.

both Canada and the U.S., will realize a 40 percent replacement of final salary from the government-sponsored social security system. Assume that to achieve true economic security, such a worker requires a 70 percent replacement ratio at retirement; this is a fairly standard goal.

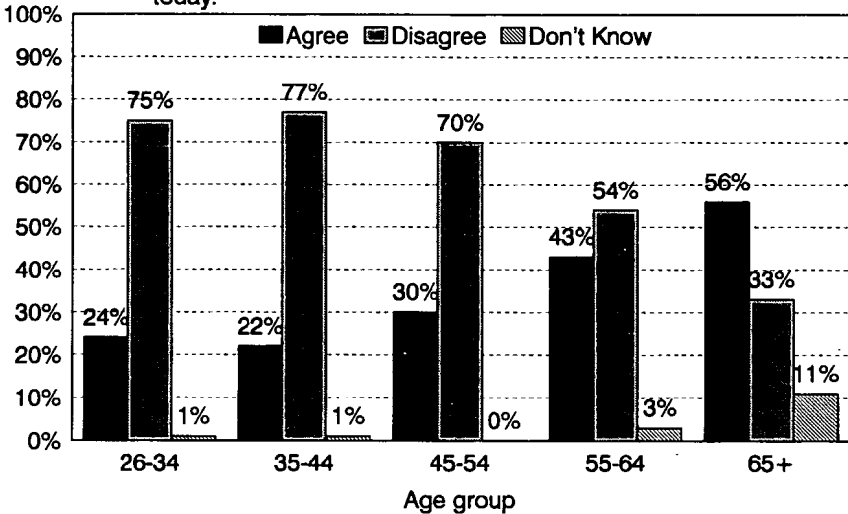
If the worker uses nonqualified or nonregistered products to try to achieve this goal, Table 6 shows how much of each year's salary must be saved.

Table 6 can be used for a number of purposes. First, it shows that without the use of qualified or registered funds, it is very difficult to achieve retirement income security with savings rates that are realistic. Second, it shows just how difficult it is to retire early. Finally, it displays the funding requirement differences between males and females because of the longer life expectancies of females.

FIGURE 17

CONFIDENCE IN FUTURE PAYMENT ABILITY OF SOCIAL SECURITY AND MEDICARE, BY AGE*

"I am confident that in the years to come, the Social Security and Medicare systems will continue to provide benefits of equal value to the benefits received by retirees today."



*From Mathew Greenwald & Associates, Inc. *National Taxpayers Union Foundation Survey on Retirement Confidence*. Washington, D.C.: 1991. Copyright © 1991, Mathew Greenwald & Associates, Inc. Reprinted with permission.

Table 7, on the other hand, displays the same required percentage of salary that must be saved if a worker is able to use a qualified or registered pension plan.

This juxtaposition shows the potential plan participant or plan sponsor just how critical the use of qualified or registered funds really is. In Canada, it is possible to access individual registered savings plans without their being part of a group pension, on an equal basis, in terms of contribution limits and tax deferrals. However, the group pension scheme will normally cut the required employee contribution at least in half compared to saving for retirement in an individual plan. In the U.S., the limits now being placed on individual retirement accounts are so severe

TABLE 6
REQUIRED PERCENTAGE OF SALARY
THAT MUST BE SAVED
USING NONQUALIFIED OR NONREGISTERED FUNDS
(70% REPLACEMENT RATIO)*

Gender	Age at Which Saving Starts	Age at Retirement	
		60	65
Male	25	14.1	10.2
	30	16.5	11.6
	35	19.8	13.6
	40	24.7	16.3
	45	32.9	20.3
Female	25	17.5	12.9
	30	20.4	14.7
	35	24.5	17.2
	40	30.6	20.6
	45	40.9	25.8

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TABLE 7
REQUIRED PERCENTAGE OF SALARY
THAT MUST BE SAVED
USING QUALIFIED OR REGISTERED FUNDS
(70% REPLACEMENT RATIO)*

Gender	Age at Which Saving Starts	Age at Retirement	
		60	65
Male	25	6.0	4.1
	30	7.7	5.2
	35	10.0	6.6
	40	13.7	8.7
	45	19.9	11.8
Female	25	7.0	4.9
	30	8.9	6.2
	35	11.7	7.9
	40	16.0	10.4
	45	23.2	14.1

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that, for many workers, the group pension concept may be the only means of achieving real retirement income security.

There will be two other important impacts of the aging population on group pension plans.

First, today we have a continuing trend towards early retirement. However, starting in 2016, when the baby boomers will normally expect to start retiring and when the labor force will be made up of the baby busters, pressure will grow for later rather than earlier retirement for those who can continue to be productive. This pressure will be enhanced by the later normal retirement age in the OASI system and by similar legislated changes that can be expected by then in the C/QPP.

Those responsible for the design of such group pension plans can expect increasing demands for more flexible retirement income formulas. If an employer wants to entice a worker to stay on beyond normal retirement, the worker can be expected to demand very flexible retirement transition arrangements. Possibilities include working half-time and continuing to earn retirement benefits on those earnings, while at the same time drawing half of his or her pension. The "half-time" may be half-days, but it could also be long weekends or even winters off. The possibilities are endless. Flexibility will be the key.

Second, the aging population will have a significant impact on the investment of pension funds. As the baby boom ages, it creates temporary demands for age-specific products. In the 1950s it was baby products and schools. In the late 1960s, it was postsecondary educational facilities and sports cars. In the 1980s it was housing, appliances and commercial office space.

In each case, as the baby boomers were replaced by the baby busters, these temporary areas of high demand became immediately depressed and the value of an investment could wither away seemingly overnight. This is seen in the decline in value of the overbuilt commercial office space that now sits empty in almost every major city in North America. Our homes, which were supposed to be our retirement nest eggs, now appear to be egg on our face. What will be next?

Obviously, the aging population will bring with it the need for far more medical care. This will be a boost to prescription drug companies, long-term-care facilities, and community care centers. The value of good-quality condominiums will return, while the need for large suburban houses will continue to decline. Retirement properties in the Sunbelt will also be a worthwhile investment. Downhill skiing will fade as the interest in

hiking, gardening and golf grows. There will be increased demand for reverse mortgages or home equity conversion plans.

One final prediction about the investment of pension funds seems obvious. From now until about 2016, all the baby boomers will be saving for retirement. Investment funds will be challenged to achieve real rates of return anywhere near what would be considered normal today. In fact, it will be difficult to achieve real rates of return as high as 3 percent for the next 25 years. Starting in 2016, however, those same baby boomers will all start to liquidate their retirement savings. Billions of dollars of accumulated savings will be spent over a relatively short time (the youngest of the baby boomers will be age 90 in the year 2056.) This will have a tremendous impact on all the investment areas: stocks, bonds, whatever form it has taken. This will be a major challenge for us all and one for which early planning cannot start too soon.

CONCLUSION

In reporting on many of the trends presented here, the popular press often includes the word "crisis." For example, headlines often speak of the "Coming Crisis in Social Security Funding" or the "Crisis Facing Our Health Care Systems." The word crisis is very interesting. To translate the word crisis into Chinese takes two characters for a literal translation. If in turn these two Chinese characters are translated back into English, their literal translation is: "dangerous opportunity." For those responsible for the design, pricing, and marketing of group life and health and group pension products, the aging population is indeed a "dangerous opportunity." The workers and consumers of North America are desperately seeking economic security. With each passing day, they have less and less faith in the ability of their governments to provide them with that security. Instead, they are looking to the private insurance sector to fill that void and supply those products. This will be a challenge, but it will also be a great opportunity for those who prepare for it properly.

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DISCUSSION OF PRECEDING PAPER

SAM GUTTERMAN:

Rob Brown has written an excellent paper focusing on a very significant demographic trend, the aging of the U.S. and Canadian populations and the impact on various group products. In general, the study of historical demographic and financial trends and the evaluation of the impact of probable alternative future trends should prove to be valuable input to both long-term and short-term strategic planning of the insurance and many other industries.

As is clear from the paper, it is easy and often wrong to simply extrapolate recent trends, whether demographic or financial. For example, it would have been easy in 1960, based on historical experience, to extrapolate a continuation of the baby boom. It is now correspondingly easy to extrapolate an even lower or at least flat fertility rate. In fact, as shown in Figure 1, the first extrapolation would have been quite dangerous in determining how much manufacturing capacity would have been needed in an industry selling baby products. It may be similarly dangerous today to extrapolate in the other direction. It is often useful to examine such trends over the long term to obtain a range of reasonable values from which to develop feasible alternative scenarios. This is appropriate in view of the cyclical nature of certain trends (whether financial or demographic) or the likelihood of discontinuities in such trends. Certainly linear extrapolation should always be used with caution.

In addition to the demographic and labor patterns that are described in the paper (baby boom/bust, changes in labor participation by sex, earlier retirement, increase in single-head-of-household families, and improving life expectancies), other potentially significant trends should be evaluated in the design and marketing of insurance products. They include, but are not limited to, the following:

- An increased number of companies with a small number of employees, particularly those headed by females.
- Changing ethnic mix in various parts of both the U.S. and Canada, reflecting in part increased immigration from Asia and Latin America. These segments of the population may have different cultural backgrounds, resulting in unique savings and purchasing habits. In some cases, the only way of determining the impact of such trends is to conduct focus group studies of these populations.

- Widening wage disparity that became apparent in the 1980s. Some believe that this is due to increased foreign competition, reducing the relative number of unskilled high-paying domestic jobs. It is clear that the mix of jobs in our countries has changed and most likely will continue to change. This may result in different private and public security needs in the future.
- After a long-term decline in labor force participation for individuals over age 65, participation may increase in the future, particularly in non-full-time employment. This may be a result of increased uncertainty about the adequacy of projected income support and increased life expectancy.

GARY L. CORLISS AND FRANK KNORR:

We certainly agree that a great opportunity is unfolding for the insurance industry to provide security for an aging population. The challenge of meeting the future financial needs of an elderly population is not limited to North America. The demographics and limitations of government financing of country after country around the world make it clear that a well-designed private insurance program is essential in meeting that challenge.

A natural extension of insurance covering disabilities during the working years, when loss of income is the major concern, is insurance covering disabilities after the working years. We think that such long-term-care (LTC) coverage needs to be emphasized. Disabilities after the working years may cause loss of dignity, loss of independence and loss of assets even beyond the face amount of most life insurance coverage and the person's life savings. Pension benefits are meant to cover the day-to-day needs of healthy retirees, not the extra expenses of a nursing home stay, adult day care or home health care. By the time many baby boomers will require such care, a nursing home stay could cost more than \$100,000 per year.

Many of the demographics pointed out in this paper support the need for LTC coverage. The increasing participation of women in the labor force and the decreasing fertility rate mean that traditional sources of care must change. The term "sandwich generation" is used to refer to those adults who are "in between" taking physical and financial care of their children and parents. Traditionally, it has been women who physically take care of their ailing parents.

Similarly, most of the time it is the women who care for aging parents and spouse. Between ages 65 and 75, 82 percent of males are married and 53 percent of females are married. Over age 75, these percentages drop to 70 percent for males and 25 percent for females.* When increased life expectancies are combined with this lack of family caregivers, it is clear that paid care providers must be considered when talking about economic security.

Home care providers allow people to preserve much of their independence. Other community-based services provide support for couples in situations in which the care required is too demanding for one person. We think that it would be irresponsible to rely on government funds, pensions or even life insurance proceeds to pay for these services. Specific, comprehensive LTC coverage must be a part of properly designed group products.

The time to introduce an employee to LTC insurance is not at retirement when affordability might be a problem but as early as possible. Many people in their 30s and 40s already understand the consequences of being financially unprepared for conditions requiring long-term care. These people typically have learned through the experiences of family members. Also, it is not unheard of for LTC benefits to be paid to employees or their spouses at younger ages.

It has been said that having a pension, life insurance, medical expense, and disability income coverage without LTC coverage is like being covered with armor from head to foot with a large hole over your heart. We concur.

(AUTHOR'S REVIEW OF DISCUSSIONS)

ROBERT L. BROWN:

I thank Messrs. Gutterman, Corliss and Knorr for their discussions of my paper. I also received oral responses from Bob Myers and Jim Hickman that were both supportive and stimulating.

I agree with the points that Sam Gutterman makes. Sam concludes his commentary with a list of potentially significant trends that should be evaluated in the design and marketing of insurance products. I will not repeat them here but encourage the reader to review this list. I agree with the list and also Sam's note that the list is significant.

*U.S. BUREAU OF THE CENSUS. *Current Population Reports*, Series P-20, No. 433. 1998.

Gary Corliss and Frank Knorr advocate greater concern by the industry for the need for LTC coverage; I am certainly in agreement with that sentiment. As stated, by the time many baby boomers will need such care, it could cost \$100,000 in inflated dollars. The baby-boom generation needs to save for that eventuality starting today. This is especially true in the U.S., where there is no guaranteed minimum income post 65 nor is there a guarantee of chronic care coverage in the Medicare system for all citizens. Such LTC coverage would be a new product in the insurance industry's portfolio, one that could provide huge dollars of savings if marketed appropriately. As stated by the discussants, the time to arrange for such coverage is not at retirement but at the earliest age possible to enhance affordability.

In summary, I thank the discussants for their stimulating comments. It is nice to know that someone actually reads one's work.